

Vaisala online DGA monitoring

Prevent transformer faults and protect power generation assets

Zhejiang Zheneng Shaoxing Binhai Thermoelectric was created to solve the problems of insufficient secondary energy supply and environmental pollution in Shaoxing, China. It supplies electricity and clean thermal energy to the public. The company is responsible for the construction, management, and operation of the heat supply network project for Binhai Industrial Zone III.



The event that all power utilities want to avoid is a non-scheduled outage, which can result in equipment damage and revenue loss as well as immeasurable harm to a company's reputation. Around half of all power transformer faults can be prevented by using online monitors. However, at present, many monitors give false alarms and require regular maintenance, meaning wasted time for personnel and higher costs for power utilities.

Vaisala provided Zhejiang Zheneng Shaoxing Binhai Thermoelectric with the Optimus DGA Monitor OPT100, which enables online monitoring of the amount of hydrogen and all the key fault gases in transformer oil.

Challenge

- Moisture and dissolved gases in power transformer oil degrade the insulation capacity of the oil and also speed up the aging process, increasing the likelihood of a fault.
- If a fault in the main transformer leads to an unplanned outage, the associated costs are typically extremely high.

Solution

- Vaisala provided dissolved gas analysis (DGA) online monitors (the Vaisala Optimus DGA Monitor OPT100) for the two main transformers to measure the hydrogen and hydrocarbon gases in the transformer oil.
- The Vaisala DGA OPT100 provides real-time and fault-free gas monitoring.
- The sensing technology for carbon oxides is based on infrared (IR) light absorption, where different gases have unique absorption characteristics.

Benefits

- Continuous real-time monitoring enables trend analysis and correlation. The Vaisala DGA OPT100 minimizes false alarms and requires no consumables or regular maintenance.
- The hermetically sealed structure supports vacuum and pressure variation while the magnetic pump and valve ensure robust and safe operation.
- Thanks to the monitor's independent plug-and-play monitoring system, installation can be completed quickly; the browser-based user interface means no other software is required.

High-quality design and materials

IR sensors are manufactured in Vaisala's cleanroom and are based on Vaisala's proprietary technology. Vacuum gas extraction prevents oil temperature, oil pressure, and oil type from causing data fluctuations, while the sealed and protected optical devices prevent the sensors from being contaminated.

The online monitor has a browser-based user interface that allows users to access and browse real-time data without the need for other software. The device can be installed in less than two hours by simply connecting the oil circuit and power supply. If there is an abnormal situation, such as a power failure, the monitor uses self-diagnosis to support self-recovery. The Vaisala DGA Monitor OPT100 minimizes false alarms, provides a reliable long-term data trend, and safely prolongs the service life of transformers.



The Optimus OPT100 DGA Monitor gives out of the box performance, completely eliminates false alarms, and offers the best long-term stable measurements of any device on the market – all with no maintenance.

Consistent and reliable monitoring

After a period of testing, the monitoring numerical trend provided by the Vaisala DGA Monitor OPT100 was completely consistent with the results from manual sampling. With online monitors, personnel can refer to the real-time monitoring values in ordinary time, thus extending the cycle of manual sampling. The Vaisala DGA Monitor OPT100 ensures excellent performance in all environments due to its robust design. It needs no consumables or wear parts and no regular maintenance.

Pan Shenghua, Vice Director of the Equipment Management Department of Zhejiang Zheneng Shaoxing Binhai Thermoelectric, says: "The most impressive thing about Vaisala is their highly reliable products and precise and normative services. The online monitor has a high-end look, and the quality of its related accessories is impeccable. The OPT100 can provide data that accurately reflects the operational status of the transformers – and it has never had a false alarm. In addition, the site installation personnel are very strict and careful in the whole installation and commissioning process. I am very satisfied."



"The products and services of Vaisala are much better than those of other suppliers. Long-term testing has proven that the Vaisala DGA Monitor OPT100 is high quality, safe, and reliable. In terms of product, installation, commissioning, service, etc., if the best score is 10 points, I would give Vaisala 9.5 points."

*Pan Shenghua, Vice Director of Device Management Department
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Zhejiang Zheneng Shaoxing Binhai Thermoelectric Co., Ltd, under Zhejiang Energy Group Co Ltd., is one of the key projects of Zhejiang Province in the "Eleventh Five-Year Plan" period. It is a new type of CHP enterprise created by Zhejiang Provincial People's Government to solve the problems of insufficient secondary energy supply and environmental pollution in Shaoxing.

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