

Lifetime Analysis reduces power plant downtime

Faster evaluations with no downtime at the Zolling power plant – thanks to switching to online PD measurement



Customer

GDF SUEZ Energie Deutschland AG, Zolling power plant

Customer location

85406 Zolling, Germany

Project

Main cooling-water pumps 1 and 2, wash-cycle pump 1, and main condensate pump 2

Implementation period

July 2014

Scope of delivery and services

- Hardware for the Lifetime Analysis systems
- Attachment of the systems to main cooling-water pumps 1 and 2 at the Siemens plant, Vogelweiherstrasse, Nuremberg, Germany
- Attachment of the systems to wash-cycle pump 1 and main condensate pump 2 on site at the customer's plant
- Startup and calibration of the Lifetime Analysis systems at the customer's plant
- PD measurements and generation of reports

The challenge:

Minimizing downtimes during monitoring

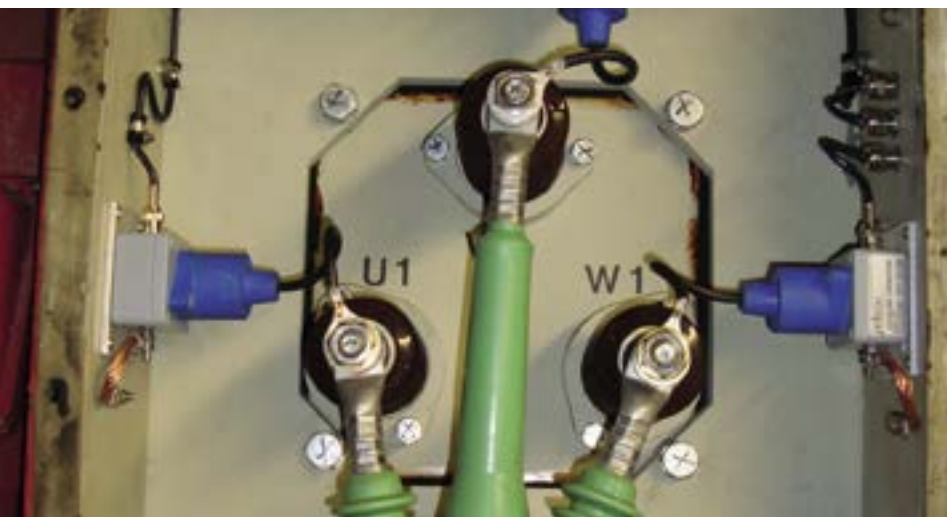
The state-of-the-art coal-fired power plant in Zolling supplies electricity to about 1.7 million people on average every year. Since 1988, generating unit 5 alone has been delivering district heating from combined heat and power (CHP) to up to 20,000 four-person homes in the Freising region every year. The Zolling site is one of Europe's most efficient coal-fired power plants – with some of the world's lowest CO2 emissions.

GDF SUEZ was looking for an economical solution for monitoring the aged windings in two 1,600 kW medium-voltage motors that are crucial for the main coolant supply.

Siemens had been conducting an annual check of the partial discharges (PD) – that is, a PD measurement – on 11 medium-voltage motors in the power plant in order to increase plant safety and prevent unscheduled downtime. In the conventional PD measurement – which assesses the wear to the insulation system and locates weak points – the motor had to be disconnected and de-energized.

To minimize effort and costs, GDF SUEZ asked Siemens to perform the PD measurement during operation. Using the existing measuring instruments and the installed measuring sensor technology, the Siemens experts searched for a solution that permitted attachment to the motors and the installed terminal boxes.





Main terminal box including coupling capacitor

The solution:

From offline measurement to Lifetime Analysis

Online PD measurement can be used to prevent downtime during winding tests. It can be performed during ongoing operation, and so it provides more accurate results. Another benefit is the continuous recording of the winding temperature for determining the thermal wear profile.

To fulfill the power plant operator's request, Siemens installed and started up a Lifetime Analysis system on each of four medium-voltage motors (main cooling-water pumps 1 and 2, wash-cycle pump 1, and main condensate pump 2).

The Lifetime Analysis systems were attached to both main cooling-water pumps 1 and 2 at the Nuremberg workshop, tested for functioning, and precalibrated. At the end of the startup process, the customer saw its first online PD measurement during ongoing operation and received the first measurement reports.

A service technician installed and calibrated the systems on the two motors of wash-cycle pump 1 and main condensate pump 2 during an inspection shutdown at the customer's plant. In this case as well, the first online PD measurement and reports were generated.

Results and benefits:

Significantly faster assessments

In online measurement, the PDs are measured for the actual voltages at different sections of the winding at operating temperature: for example, neutral point is equal to zero. This produces a more realistic picture of the machine during operation, of the full expansion of the insulation system, and of the winding temperature. Thanks to the reduced measurement effort and elimination of disruptions to ongoing production, GDF SUEZ also saves costs.

The PD signals are recorded at regular intervals and evaluated by Siemens PD experts. GDF SUEZ receives a status report that recommends measures to increase plant safety and transition to a scheduled downtime. The power plant operator can now avoid winding damage and reduce the associated maintenance costs.

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