



DRM

Dynamic Contact Resistance Measurement Kit for HV Circuit Breakers

High-voltage (HV) circuit breakers are essential for the protection and proper operation of a power grid. They are constantly monitored and tested to verify that they are working properly and to detect any sign of imminent failure.

Monitoring depends in part on an effective technique for judging the condition of HV circuit breaker contacts. To achieve this, a team from Hydro-Québec's research institute, IREQ, has developed a new diagnostic method that consists in measuring the dynamic resistance of HV circuit breakers to assess wear in main contacts and arcing contacts simultaneously. This innovative measurement technique has been developed into the dynamic contact resistance measurement (DRM) kit, marketed under licence by Zensol.

Innovative technique for high-performance diagnostics

To date, accurate diagnostics meant inspecting inside the circuit breaker's interrupting chamber, a long and costly operation requiring, for SF₆ gas circuit breakers, numerous precautions in handling the gas and arcing by-products.

The new DRM technique consists in measuring voltage, current and contact travel as the circuit breaker is opened in order to accurately assess the internal condition of the interrupting chambers. Intrusive inspections can thus be better targeted or even altogether avoided. The high-performance DRM kit has been tested under actual conditions on the Hydro-Québec system and is now being incorporated into the company's maintenance practices.

The kit's originality lies mainly in its ability to allow quick, straightforward, reproducible measurements ensuring a reliable diagnostic of the condition of HV circuit breaker contacts without the need to open the interrupting chamber.

The DRM kit is made up of a direct current power supply, voltage, current and travel sensors, and a data acquisition unit including acquisition and analysis software.

Key advantages

- > Non-intrusive measurements
- > Straightforward interpretation of results
- > Easy detection of contact defects (excessive wear, misalignment, loosened arcing contact tips, etc.)
- > Accurate diagnostics without inspecting the inside of interrupting chambers
- > Enhanced reliability and availability of circuit breakers
- > New method tested on HV (69 to 735 kV) SF6 circuit breakers
- > Improved and less costly maintenance practices

For information:

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