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MOSAD®–MST

On-line diagnostics of power oil transformers

In cooperation with EGU HV Laboratory, a.s., TES has developed and operates the on-line diagnostic system MOSAD®–MST, designed in particular for oil transformers of energy power production units, including nuclear ones. The system is designed to be able to provide clear information on the emerging transformer failure during the initial stage of development as well as sufficient data for an expert assessment of failure severity.

MOSAD®–MST

System benefits

- Detection of emerging transformer failures.
- Expert assessment of transformer failure severity.
- Information on the status of overall lifetime of the transformer.
- System resistance against all types of electromagnetic interference.
- Capacity of autonomous operation, long-term, without operator‘s interference.
- Modular system architecture.

Diagnostic properties monitored by MOSAD®–MST

- Gases dissolved in oil and its moisture.
- Current, voltage, power.
- Change of capacity and tgδ of penetration.
- Switching and atmospheric overvoltage.
- Short-circuit currents.
- Partial discharges.
- Oil temperature in different places of the transformer.
- Tap changer.
- Status (binary properties).

Brief technical description

MOSAD®–MST is designed with a modular, open architecture, which makes it possible to modify the range of the monitored parameters for each specific transformer. It also allows an additional connection of other diagnostic properties unplanned during original installation. In case of machine failure or accident, the system records its development in detail and provides precious data for the prevention of failures in other transformers. The system also provides information on the status of overall lifetime of the transformer.

Output monitor functions

- Directly measured and derived properties.
- Current status characteristics.
- Time sequences of the measured and derived properties.
- Model for the calculation of the hot spot on the winding.
- Thermal power balance model with energy flow monitoring.
- Limit alarms.
- Self-diagnostics of the MOSAD®–MST monitoring system.

The monitoring system is not directly linked to transformer control, i.e. all of its outputs are fed to the operators, who then decide which actions to take. If the parameter set points and trend limits are breached, the respective alarms are triggered. To ensure optimum decision-making, a rule-based expert system is supplied as an extension of the monitoring system; it determines the operators‘ steps in case of alarm settlement as well as during normal operation.