Transformer Condition Assessments

Siemens has a strong heritage of expertise across Transmission and Distribution equipment. Our audit tools have been specifically developed for the performance of objective, transparent and comparable condition assessments.

Siemens assessments provide the basis for a targeted maintenance strategy of critical substation assets like high voltage gas insulated switchgear (GIS), high voltage circuit breakers, power transformers and medium voltage switchgear.

The results of these assessments are properly documented with multilingual audit reports.

Each report includes a graphical representation of the transformer condition, comprehensive audit information, a statement about the environmental impact of the transformer condition as well as recommendations for condition based maintenance.

Audits for Transmission and Distribution equipment

Audits for Power Transformers

Siemens audits for power transformers are structured as follows:

- Gathering of General Information about the transformer like operation time, performed maintenance, technical key data, etc.
- Visual Inspection of the transformer, being the equipment in operation or out of operation. Assessment of the installation, oil condition, tank and gaskets, cooling system, bushings, tap changer, etc.
- Extended Diagnostic, performing specific measurements, functional checks of secondary system and tap changer as well as an internal inspection of the tank, bushings, tap changer, etc.
Assessing the Condition of Transformers

A power transformer condition assessment with our audits tools can include the following activities:

General Information
- Analysis of technical and historical information like years and type of operation, performed maintenance procedures, major faults, etc.

Visual Inspection
- Environment
  Analysis of installation area, environmental influences and oil sump condition
- Oil
  Evaluation of previous oil analysis. Analysis of gas-in-oil monitoring system and past maintenance procedures
- Tank and gaskets
  Inspection of oil conservator, oil level, tank external condition, gaskets and oil sampling valves
- Cooling system
  Assessment of radiators / coolers, gaskets, fans and pumps
- Bushings
  Analysis of bushings external condition, oil levels and gaskets
- Tap changer
  Evaluation of motor drive condition and number of operations
- Inspection of surge arresters
- Protection and secondary system
  Assessment of Buchholz relays, pressure relief devices, indicators, control cubicle and wiring
- Inspection of dehydrating breather

Extended Diagnostic

Measurements & Functional Checks
- Functional checks
  Check of relays, pressure relief devices, indicators, protection and tap changer motor drives
- Oil measurements
  Gas-in-oil analysis. Measurement of oil quality, PCB and furans
- Active part
  Measurements of turns ratio, winding resistance, FRA, short circuit voltage and losses, no-load current and losses
- Insulation
  Measurements of winding insulation resistance, core grounding insulation resistance and PD measurements
- Bushings
  Tan Delta and capacitance measurements

Internal Inspection
- Transformer tank inspection
- Bushings
  Inspection of bushings connections
- Insulation
  Paper sample and inspection of winding insulation, insulation of tap changer connections and lead insulation
- Active part
  Analysis of foreign matter in active part, and evaluation of core condition
- Tap changer
  Internal inspection of tap changer, pre-selector, contacts and leads
- Secondary system
  Inspection of current transformers and current transformer leads