Preventive maintenance through inspection and rehabilitation
Ensuring a long life for your transformer

A transformer is from its inception of operation impacted by stress due to internal and external factors which affects the potential life time and availability of operation. By taking advantage of ABB’s inspection and rehabilitation solution, the user can minimize down time and prolong the expected lifetime of the transformer through preventative maintenance.

The cost of a failure
Transformers are an integrated part in power supply systems, and as a result the financial consequences of their failure can easily exceed their asset value. This applies equally to power and distribution transformers used in utility or industry applications.

To ensure transformer availability and meeting it’s full life potential ABB has refined a method for inspection and rehabilitation of transformers from 50 kVA to 500 MVA where the customer decides on the level of actions depending on needs and budget.

Preventive maintenance through inspection and rehabilitation
ABB offers the possibility to perform inspection and rehabilitation of transformers both on site and in a factory environment.

Inspection
- Assessing electrical and mechanical condition
- Visual inspection of tank, tap changer and auxiliaries
- Transformer tank
  - Leakage control
  - Gasket renewal
- Visual inspection of active part

Rehabilitation
- Assessing electrical and mechanical condition
- Visual inspection of tank, tap changer and auxiliaries
- Tap changer maintenance
- Active part
  - Cleaning and drying
  - Tighten up the windings correctly to increase short-circuit strength
- Checking of the earthing and measurements
- Transformer tank
- Leakage control
- Gasket renewal
- Testing

Benefits
ABB has developed the offering to provide the user of the transformer a peace of mind that the equipment is fit for use. The rehabilitation offering reduces the mechanical tear and extends the life time of the transformer by reducing the moisture level of the oil and in the winding cellulose. As a result the risk for failure in operation is reduced.

By extending the life time capital investment can be postponed, and the improved reliability is also beneficial for the environment as potential leakages and failures are minimized.
Customer success stories

With ABB’s extensive experience of performing preventive maintenance on transformers around the globe, the following examples indicate solutions which can be implemented on your equipment in factory or at site.

Refurbishment of 40 MVA (123 kV) network transformer in factory in Vaasa, Finland

Customer was looking for an extension of life time on the transformer through a refurbishment. Scope of the project included initial inspection, electrical condition assessment, tightening the windings and repainting. Quality of the refurbishment was assured by vapor phase drying the unit and filtering the oil. The refurbishment was completed in the factory with a turn around of five weeks and a total outage of six weeks for the user.

Rehabilitation of 160 MVA (300/52/17 kV) Lyse transformer on site in Norway

Due to transportation and outage constraints, a rehabilitation was performed on site. An indoor area was created around the transformer so the work could be done in a clean, protected environment. The scope included initial inspection, electrical condition assessment, refurbishment and surface treatment of lid tank and coolers. Auxiliary equipment on the transformer was refurbished or replaced as determined necessary. To ensure adequate condition of the transformer, the windings were retightened and dried with a low frequency heater and the oil was regenerated. The rehabilitation was completed in ten weeks with a total outage time of twelve weeks and a favorable cost to the user.

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User illustrated example based on research performed by SINTEF “Transformer Windings”, Lundgaard et Al, 2011-11-03. Graph calculated with an assumed end of life at DP 200, with a given average operating temperature and reducing the moisture in the winding insulation from 3.5 to 1.5 percent.