TransForLife Solutions
Knowing whom to rely on
When failure hurts
The traction transformer is a crucial component in the traction chain. If the transformer fails, it can affect train performance and operator services - passengers are inconvenienced, train schedules are disturbed and costly penalties may be incurred.

Given that the average age of on-board traction transformers in locomotives and EMUs in Europe is over 25 years and that aging assets increase the risk of failure, it is imperative for rail operators to know the state of their traction transformers and the life extension possibilities available to them.

Planning ahead makes business sense
Rather than reacting to problems when it's too late, choosing ABB makes it possible to predict and rely on traction transformer performance with confidence. Maintaining the traction transformer at the peak of operational health:

- Eliminates unexpected problems
- Reduces the risk of power outages
- Ensures the optimal use of equipment
- Provides knowledge on the status and availability of assets
- Provides access to uniquely skilled teams all over the world and a complete portfolio of service solutions

ABB TransForLife Solutions™
ABB TransForLife Solutions is a proven service package of fast, reliable and cost-effective solutions, tailor-made to fit individual needs.

ABB TransForLife Solutions are designed to meet the service requirements of individual traction transformers and entire fleets, and are performed in accordance with international standards.

Our service package includes:
- ABB TrafoAssetManagement™
- Factory Remanufacturing/Repair
- Field Service/ABB TrafoSiteRepair™
- Engineering Solutions
- Fleet Midlife Refurbishment/Overhauling
- Advanced Field Service
- Spare parts ‘Safety Kit’

Competence makes all the difference

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<th>Traction transformer life cycle (years)</th>
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Time based maintenance:
- Advanced diagnostics
- Periodic factory revision / On-site revision
- Warranty extension

Based on ABB expertise:
- Life cycle cost study (LCC)
- Maintenance planning (MTBF calculation)
- ABB ServIS database

Condition based maintenance:
- ABB midlife fleet overhaul
- ABB Railway overhaul package
- ABB TransForLife™ maintenance program

Corrective maintenance:
- Factory repair
- Winding supply
- ABB TrafoSiteRepair™

Consultancy:
- Power upgrade
- Technical studies
- Design modification
A complete portfolio of service solutions

**ABB TrafoAssetManagement™**

ABB TrafoAssetManagement defines and implements condition-based management in proactive steps. It assesses the status of transformer assets and is available for fleets or individual units.

**Features**
- Evaluates the condition, remaining service life and risk of failure
- Enables planned maintenance and equipment operations
- Enables planned investment in the right equipment
- Schedules preventive maintenance actions for the asset manager
- Increases visibility and predictability

**Benefits**
- Life assessment/profiling
- Design and condition assessment
- Traction transformer fleet screening
- Modular analysis in three steps:
  - Defines actions to mitigate risk and risk of failure

**Engineering Solutions**

Our engineering solutions provide a new level of intelligent services that improve the performance, availability, efficiency and predictability of a traction transformer fleet or single unit.

**Diagnostics and testing, condition assessment, training, engineering and consulting services**, and innovative solutions that meet diverse environmental requirements all form an integral part of our engineering solutions portfolio for railway customers.

**Knowing the condition of a traction transformer fleet or single unit is the key to success for an optimal fleet maintenance program.**

**Factory Remanufacturing/Repair**

ABB transformer factories and workshops are characterized by their orderliness, cleanliness and the presence of specialist teams in each technical field and process area. They are equipped with heavy lifting equipment, special tools, drying facilities and test bays.

ABB improves transformer performance and increases the value of existing equipment by assessing the state of the components and performing a full technical refurbishment of the transformer.

Repairing a traction transformer instead of replacing it can substantially reduce investment costs and provide a faster turnaround than buying a new transformer.

**Field Services/ABB TrafoSiteRepair™**

Drawing on 120 years of transformer manufacturing experience, ABB TrafoSiteRepair is often the best solution when time or transportation difficulties are restrictive. ABB offers identification and traceability of equipment, periodic status assessment, condition-based maintenance, repair and performance improvement, asset optimization, material recycling, and user training.

**Fleet Midlife Refurbishment/Overhauls**

An extensive overhaul after 15-20 years extends the traction transformer’s operating life and increases reliability. Refurbishment includes:
- Visual inspection of the active part of the traction transformer
- Dissolved gas and oil analysis
- Analysis of events, maintenance and operation history
- Transformer and active part drying
- Advanced diagnostics to check mechanical, thermal and electrical condition
- New/refurbished accessories such as onload tap changers, bushings, pumps, temperature sensors, valves, gaskets, water coolers
- Refurbishment of the active part - including cleaning, winding reclamping and connection retightening - and new installation parts

**Advanced Field Service/Diagnostics**

Oil reclaiming – Water, acids and sludge are oxidation products that cause the most concern in oil aging. Reclaiming the transformer oil restores the oil’s properties close to those of new oil.

Advanced diagnostics - Close observation of dissolved gases in the oil and other oil properties provides valuable information on transformer health. ABB’s advanced diagnosis analysis typically reveals the severity of the problem, locates the fault and provides expert advice on what action to take.

**Spare Parts “Safety Kit”**

Having critical parts on hand can significantly reduce the downtime associated with traction transformer maintenance and failure. Some of these parts can be purchased ‘off-the-shelf’ from the manufacturer. Other parts can take months to obtain.

It is therefore essential to have readily available critical parts and components such as bushings, relays, gaskets, fan motors and pumps. These parts should be kept in stock at the customer’s warehouse in order to avoid long outages.

ABB has the original design documents for an impressive number of transformer brands that now belong to the ABB family: ABB, ASEA, Ansaldo Breda, BBC, CGE, Eléctrico Bureau, Elta, GE, Gould, IEL, ITE Indalve, Italtimbro, Lappin, MFO, Marelli, Moloney, National Industris, Oceans, OEL, OTE, Richard Pfeiffer, Sicharon, Stimberg, TBB, Thrige, Westinghouse and others.

This makes it possible to trace part numbers and rapidly obtain original parts for replacement. We can also provide additional engineering support to find equivalent parts or to redesign parts to replace the ones that are no longer available.

**Recommended solutions**

1. Regular Asset Services
2. Early Life Inspection
3. Midlife Refurbishment
4. End of Life or Remanufacturing for Life Extension

**Benefits**
- Shorter lead times from correct project scheduling
- Reduced maintenance costs
- Upgraded components improve reliability and reduce the risk of outages
ABB’s global transformer expertise

**ABB, a pioneer in traction transformers**

ABB has been a pioneer in traction transformer design since the early 1900s and has a long and proven track record in a broad range of state-of-the-art traction transformer technologies.

**Global experience - local solutions**

ABB has more than 30 transformer service centers worldwide, backed up by a permanent research and development program to ensure a constant stream of benefits for railway customers and operators.

Our service and repair teams are available 24 hours a day, ready to share their knowledge and expertise, and ensure that customers receive the support they need quickly and effortlessly.

Dedication to service is a rare phrase nowadays; at ABB it is still alive.