



TLM™

Transformer Lifecycle Management™
Transforming your assets into best-agers. Your one stop shop solution

Siemens Transformer Lifecycle Management™

A unique set of solutions, combined with the experience and expertise of the leading transformer manufacturer helps maintain the operation of your transformers at its maximum operating level.

Power Transformers are long lasting capital investment goods. Purchasing and replacement require long periods of engineering planning, resource and procurement. Each individual conception is specifically adapted to the individual requirements. The corresponding high replacement value and long delivery time are important considerations in addition to the cost of outages.

The Solutions

Maintaining your power transformers and your entire transformer fleet at maximum operational level, is the prime objective of the Siemens TLM™ set of solutions. For that the most effective TLM™ Lifecycle set of solutions apply independently of the original manufacturer, and the age of the equipment.

The situation

Power transformers usually perform their work, humming quietly for decades without any interruption. Owners have thus come to rely on their safe transformer capacity, often performing only minimal maintenance using traditional and reckoned techniques.

In most countries, over 70% of the transformer population has been in operation since more than 25 years now. The average life of power transformers in operation is exceeding the design-life in an increasing number of cases. The majority of redundancies have been utilized for normal operation, and spare capacities are often completely used-up. Today, load requirements, environmental constraints and sustainability objectives are in conflict with budget restrictions and long replacement lead-times.

Transport cost for large power transformers are an important factor, while shipping risks are increasing with the equipment age. In addition, road, rail and port conditions are such that the transport operation is taking more time, and is getting increasingly expensive with higher risks involved.

TLM™

Siemens is pooling with TLM™ (Transformer Lifecycle Management™) the most reputed and well experienced transformer experts, providing the most effective Lifecycle Service solutions to all of your power transformers – independently of their age and their original manufacturer.

The Siemens TLM™ is based on the appreciated competencies in all Siemens transformer factories, which are well-known for their high quality and low failure rates. Additionally, TLM is progressively expanding with new TLM™ Service entities in your vicinity, and is providing any service on-site with it's state of the art mobile workshops and unique on-site test facilities.

The TLM™ – Service Portfolio

The Condition Assessment and Diagnostics is a comprehensive, three-level and modular approach to evaluate the operational value of your transformers with a quality second to none. The process comprises non-invasive diagnostics, special measures and tests during the normal operation (level 1), and particular analysis which require minimum outages (level 2). We also provide High-Voltage-Tests on-site with a unique performance level (level 3).

- Oil laboratory services
- Condition assessment
- Fleet screening
- Lifecycle assessment
- Enhanced diagnosis
- High-Voltage-Tests on-site

Transforming Service into reliability –
with TLM™ – Transformer Lifecycle Management™

Answers for energy.

SIEMENS

Siemens TLM is adapting the most accurate analysis methods and is suggesting the corresponding remedial actions according to conditions and priorities, specifically tuned to each power transformer individually.

Transport, Installation & Commissioning

- Disassembly and transport preparation
- Shipping & transport management
- Installation & commissioning

When it comes to installing new transformers, or change locations of already existing units, make use of the decades of experience of our TLM™ technical experts and engineers. Disassembly and preparation for transport, storing and handling of delicate components, assembly until the complete reconstruction of transformers shipped in pieces is our daily work. We offer our exhaustive experience for complete solutions for you, so that our expert intervention assists you to keep the equipment at peak value for a long time.

Online Monitoring

- Guards
- Condition Monitor
- Integrated Condition Monitoring System

With increasing interest, on-line monitoring systems are requested to have a clear track of all events that may affect the ageing, the operational availability or that may give important information on upcoming possible failures so that those can be avoided.

Lifecycle Maintenance and Extension

- Long-term maintenance
- Preventive & curative maintenance
- Corrective maintenance
- On-line drying & degassing
- Drying active parts on-site
- Transformer oil regeneration
- Life extension procedures
- End-of-life management, scrapping

An increasing need is recognized for any solutions how to assure that the transformers will continue to work without

any incident. Here again, the Siemens TLM™ is offering a whole set of approved and well experienced solutions. All TLM™ solutions are tailor-made for ideal fit for each transformer, according to the assessed condition and the operator's expectations.

Repairs & Retrofit

- Failure root cause analysis
- Comprehensive diagnosis
- Repair and modification in house, and on-site
- Refurbishment
- Retrofit
- Upgrading
- Modernization

One of the technological highlights of the Siemens TLM™ is the complete repair "as good as new", and the modifications of any brand, and any age power transformers. This is performed in our own, and other certified workshops as well as on-site with our new completely equipped workshops and fully operational High-Voltage-Test Systems. This serves to assess the precise failure and to prove the efficiency of the repair. The full backing from our experienced engineering is guaranteeing prime performance and quality in project management and execution.

Consulting & Expertise

- Engineering service
- Advice & recommendations for preventive, curative corrective actions
- Educational seminars
- Custom-tailored workshops

The Siemens TLM™ set of solutions integrates a wide range of services which aim to considerably extend the life of your transformers.

Each of these solutions comes along with a portion of expertise. Our preferred approach however, is to integrate all transformers from any age and any brand in the reflections and considerations that we feel are important for your decisions for replacement/extension and any related service action.

As a support of your team of specialists, Siemens TLM™ is offering as well a series of standardized customer trainings. These programs are specifically designed to broaden the awareness of the various conception and design options. Of course, as an integrative part of the training, a special focus is addressed to the subjects of lifecycle management.

Spare Parts & Accessories

The supply of spare parts is another strong point of Siemens TLM™. Upon request we may advise you on what accessories will best fit the needs for your power transformers. Those could be Buchholz relays of various sizes, temperature sensors, oil-flow alarm and oil level indicators, just to name a few. In order to provide the best solution for you, Siemens TLM will verify alternative products and thrive for technical improvements with additional state-of-the-art functionalities. This we feel is an indispensable service in case that the original spare part is no longer available.

Recommendations

You should start with a TLM™ diagnostics for a complete condition assessment of all of your transformers. Based on the results of the TLM™ fleet-assessment and TLM™ diagnostics, a plan for preventive curative corrective actions and replacements shall assist you in your decisions. The result for you will be a complete, comprehensive and detailed master-plan for any brand and any age power transformers. This shall serve as a solid and approved operational data basis so that your decisions for preventive, curative, and corrective or replacement actions are most economical and can be justified and verified at any time.

Modular items of the TLM™ Service Portfolio have been defined under the SITRAM label, Siemens Transformer Asset Management. Please ask for more details about the SITRAM® set of solutions:

The SITRAM® set of solutions

- SITRAM® DIAG – condition assessment & diagnosis
- SITRAM® HVT – on-site high voltage tests
- SITRAM® MONITORING – online monitoring
- SITRAM® DRY – continuous online drying
- SITRAM® REG Oil Regeneration – oil regeneration
- SITRAM® COOL Transviso Cooling – cooler control system

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