Use careful management to lower maintenance costs, minimize risks, prioritize maintenance plans, identify critical assets and extend transformer life through near real-time monitoring. With ABB’s dynamic algorithms, perform fleet management as if you were a transformer expert with decades of experience.

Background
Because of the enormous number of transformer installations from 1950 through the 1970’s, most transformers on the grid are at least 30 years old. Transformer design life is 30 years, so asset managers must deal with the possibility of decreased reliability for these key assets. Transformer failures have increased in the recent years, and a failure peak is expected to occur towards the end of the 2010 decade according to Green Tech Media (http://www.greentechmedia.com/). Additionally, many utilities follow reactive or time-based maintenance, which leaves high opportunities for catastrophic transformer failures, does not minimize maintenance costs and does not extend transformer life.

Challenges
Some of the challenges necessitating a near real-time dynamic management program include:
- Aging infrastructure - The average age of a transformer is now more than 40 years.
- Aging workforce - Transformer owners are potentially at a huge disadvantage in losing operational technology and knowledgeable engineering and maintenance crews due to the high retirement rates currently seen in the industry.
- High cost of transformer failures - Unplanned failures can cost ten times the value of the transformer.
- Grid complexity - As more and more elements get added to the grid, transformers have to become more reliable in handling those additional loads.
- Smart grid - As we move to a smarter grid, staying informed of constantly changing transformer conditions will be a necessity to maximize flexibility.

Expertly manage transformer fleets with the DTMProgram™
The DTMProgram™ aims to have the highest level of condition understanding, including the ability to continuously monitor dynamically changing data. Incorporate over 700 years of transformer design and manufacturing expertise from legacy brands that form over 70 percent of the installed base in North America, by allowing ABB to dynamically manage your transformers using near real-time information and sophisticated analytics.

Continuously reviewing data collected by both online monitoring devices and periodic off-line test results and observations, maintenance becomes more effective, cheaper and less reactive. Without the DTMProgram™, maintenance can be expensive and time-consuming and can provide limited benefits. With the DTMProgram™, transformer data is automatically analyzed and maintenance is only performed when needed or to enhance reliability. This way, unnecessary maintenance expenditures are not wasted on low-risk assets. Also, when an issue or alarm does arise, the maintenance crew can enter the site fully prepared with the asset's history; the condition status, and the right tools, equipment and replacement parts needed to accomplish the task. The goals of DTMProgram™ include:
- Dynamically calculate the risk of failure for individual transformers and monitor the entire fleet
- Dynamically handle new data and new data types
- Provide actionable information and recommendations
- Implement solutions through user-friendly dashboards and communication systems while meeting IT requirements.
Creating the risk of failure baseline
An assessment, known as the Mature Transformer Management Program (MTMProgram™), is used to create a baseline from which the DTMProgram™ can start. ABB has performed the MTMProgram™ on over 10,000 transformers globally. There are four steps to the MTMProgram™:
1) Fleet Assessment
2) Condition assessment
3) Life profiling
4) Implementation
Only the first two steps are used to create the DTMProgram™ risk of failure baseline.

Constant integration of new information for near real-time condition analysis
In the DTMProgram™, the MTMProgram™ steps are automatically updated when any new sensor or periodic offline information becomes available. This allows an action plan to be developed and executed any time the condition of the transformer begins to show signs of degradation. Only then can maintenance crews implement true and optimal condition improvement actions.

Ventyx’s intuitive platform FocalPoint is used as the display and control dashboard for the DTMProgram™. FocalPoint creates a central monitoring point for the fleet. By integrating information from the transformer’s sensors, the MTMProgram™ assessment data, SCADA management system data and periodic (or off-line) data, the most recent and accurate condition status can be provided so that the most effective maintenance actions may be developed.

ABB offering
Reduced maintenance costs and increased reliability are usually inversely related. With ABB’s DTMProgram™, however, the two can be achieved simultaneously. The DTMProgram™ provides a constant watchdog running continuously in the background protecting your valuable assets while providing timely maintenance recommendations for the entire fleet. DTMProgram™ can also help extend transformer life by recommending system actions, upgrades, rebuilds and mitigation actions when the value added will be significant. While time is a factor in transformer aging, it is not the most influential, so it is important to continuously monitor all factors that impact reliability and aging. Only with a near real-time, dynamic program, can maintenance actions be performed at exactly the right time to optimize reliability and savings.

ABB Inc.
TRES – Transformer Remanufacturing and Engineering Services
4350 Semple Avenue
Saint Louis, MO 63120-2241
Phone: +1 800 HELP 365
Email: Transformer.service@us.abb.com
http://www.abb.com/transformerservice

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