

## Retrofit with DuPont™ NOMEX<sup>®</sup> boosts transformer flexibility and reliability, lowers maintenance costs

**Application:**

- Hydroelectric plant.

**Requirements:**

- Transformer manufactured in 1982 (non ABB unit); liquid-filled, 6,3 MVA; 21 kV/6,3 kV.

**Configuration:**

- Liquid-filled, hybrid\* insulation systems with NOMEX<sup>®</sup> brand paper and cellulosic pressboard.

**Characteristics:**

- Extended life time;
- lower losses;
- higher reliability, rating upgraded to 7 MVA (+10% compared to nominal power);
- lower maintenance costs over life time.

\*only conductors were wrapped with NOMEX<sup>®</sup> paper

Regular oil testing and visual inspection of transformers can yield benefits beyond extending their working life and increasing their reliability in critical conditions. This is the rationale behind the Transformer Retrofit and Engineering Service (TRES) offered by ABB Halle, part of the Swiss-Swedish ABB Group, a world leader in transformer design, manufacture, retrofit and repair.

Although there is nothing new about preventive maintenance, its importance and cost-effectiveness may be overlooked or underestimated in the case of high-cost capital equipment. During a recent condition assessment performed by ABB Halle engineers in the transformer park of a hydroelectric power plant, they found a liquid-

filled 6,3 MVA 21 kV/6,3 kV Trafo Union unit made in 1982, in which the insulating paper and oil had degenerated to a considerable degree due to aging. Paper and oil in transformers normally age only slowly, but the process may be significantly accelerated in case of high moisture in the oil-paper insulation system and/or high operating temperature.

ABB Halle's retrofit experts modernised the unit with NOMEX<sup>®</sup> Thermal Technology for protective insulation. The upgrading to semi-hybrid insulation, with DuPont™ NOMEX<sup>®</sup> brand paper on the conductors, yielded several benefits. ABB Halle's customer reports improved operational flexibility due to higher overload



*Illustrations show Transformer before (upper right photo) and after retrofit using NOMEX® Thermal Technology for protective insulation (left photo).*

capacity, enhanced reliability under demanding operating conditions, and reduced maintenance costs. Less maintenance will be required because NOMEX® materials show negligibly low thermal aging over extended working lifetimes resulting in significant improvement in oil quality.

ABB Halle, near Leipzig, Germany, is now the ABB Group's Service Centre for transformers in central Europe. ABB workshops in Halle and other German cities (Dortmund, Neusass, Nauen) offer a comprehensive range of repair, retrofit and maintenance services.

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