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The latest trends in transformer components





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Sustainability is not just a buzzword, trend, or fad. An increasing number of companies, governments and individuals believe in sustainable practices and are trying to imbibe sustainability into their lives. Compared to previous decades, the world is more aware of the concept of sustainability, and globally, many

companies are engaged in responsible and sustainable production, procurement, and supply. A lot of cosmetics, food, fashion, mining, and electricity companies are using sustainable practices to acquire raw materials and produce and market goods in an attempt to reduce their companies' carbon footprint by minimizing damage to the environment. Hitachi Ener-

gy is, of course, no exception and is ahead in its commitment to advancing a sustainable future for all.

Advancing a sustainable energy future for all

As a pioneering technology leader, Hitachi Energy collaborates with its



customers and partners to enable a sustainable energy future – for today’s generations and those to come. Hitachi Energy is investing heavily in a sustainable future and is engaged in making sustainability a part of its daily operations and entire product range. With the vision to build and operate sustainable transformers and transformer components, the company is committed to enabling its partners and stakeholders to participate, build, and operate in a sustainable future.

Synergy in energy – T-Sync™ tap-changers

Achieving top performance in the face of future energy demands is a massive challenge, and Hitachi Energy is helping its customers to meet it. As a world leader in transformer components, the company offers a unique combination of tap-changer technology, deep expertise and support that adapts to its customer’s needs: it is only by working in sync that synergy in energy is generated.

T-Sync™ tap-changers are developed and designed for a long lifetime: simple and open designs pave the way for further synergy – with stringent maintenance processes. Customers are offered training to enable self-sufficiency. For the more complex work, Hitachi Energy’s global network of service units and certified service providers are always available to step in and assist, offering close cooperation and support. Starting from aiding tap-changer selection through the online selection tool, [Compas](#), assistance is available through delivery and easy installation.

The power of a thousand bushings – AirRIPflex®

Hitachi Energy’s bushings platform AirRIPflex makes it easy for our customers to find the right dry bushing for their needs. These are explosion-proof, fire-resistant, and allow

TXpert is designed to deliver data-driven intelligence and decision making in operation and maintenance of transformers

a wide range of application temperatures. AirRIPflex enables compact transformers’ superior operational safety. It is the best-in-class solution for advancing both manufacturer and operator’s sustainability goals.

The AirRIPflex dry transformer bushing platform has now been extended for use in biodegradable transformer fluids, such as ester oils and other alternative fluids. A wide variety of designs ranging from 52 to 550 kV and up to 5000 A matches almost all transformer specifications. This new offering combines environmental friendliness, superior fire resistance and quick and simple installation with Hitachi Energy’s rich heritage of pioneering bushing technologies.

AirRIPflex for alternative fluids is based on Hitachi Energy’s proven Resin Impregnated Paper (RIP) technology, assuring reliable and safe operation over the entire transformer lifetime. It is tested and certified for synthetic esters and approved for natural esters, and other alternative transformer fluids.

The entire world of electrical insulation – Insulation material

One of the most important parts of a transformer is the insulation material. It withstands high temperatures and electrical and mechanical stresses. Adequate insulation is necessary for isolating the various transformer components like the coils, core, and tank and for ensuring the safety of the transformer against accidental overvoltage.

For wind farms and solar application transformers, insulation plays an even more important role due to

the demanding requirements onsite. Hitachi Energy has developed the press paper DDP-Xtherm 140, specifically designed for liquid-filled transformers used in wind and solar applications to withstand harsh environments.

Hitachi Energy makes some of its insulation materials from pressboard or insulation paper with unique properties: superior mechanical and electrical performance, compatibility with transformer oils, and thermal and aging stability.

A wide range of products made from pressboards are used in different applications and transformer components; kits comprising pre-assembled insulation parts developed for a specific oil-filled transformer design are available.

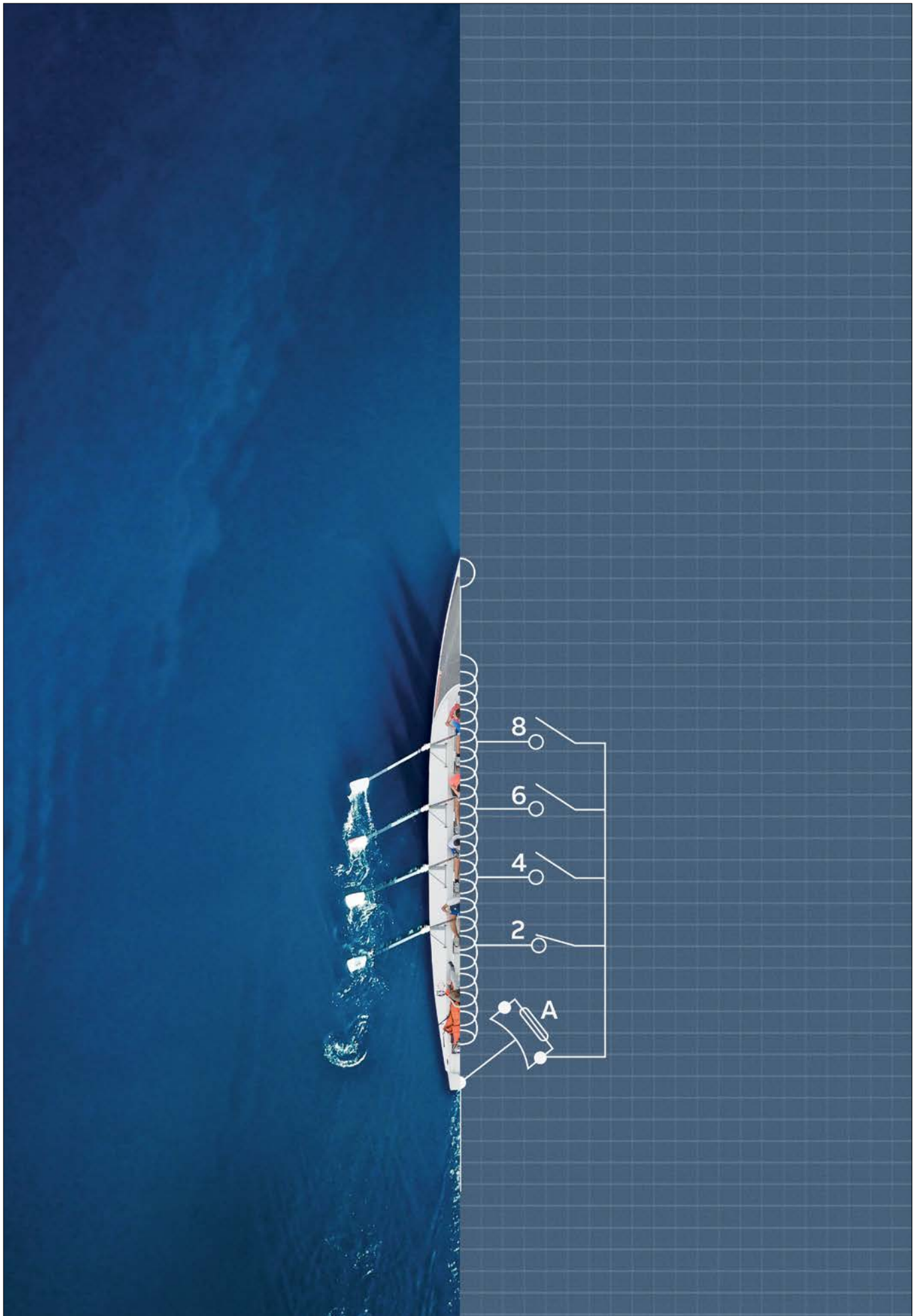
This enables the transformer manufacturer to increase production efficiency and capacity, minimize efforts in purchasing insulation parts, reduce warehousing expenses and achieve cost transparency for insulation materials.

This facilitates long-term supply agreements with pulp suppliers, ensuring vertical integration of the supply chain and full reliability.

Transforming performance – TXpert™ Ecosystem

The world and the grid are becoming increasingly digital. TXpert is an open, scalable, and manufacturer-agnostic ecosystem. It improves a transformer’s performance and unlocks the potential of a digital grid.

TXpert is designed to deliver data-driven intelligence and decision



making in operation and maintenance of transformers. The complete suite of products, software, services, and solutions can be integrated with new transformers, retrofit solutions and upgrades on existing fleets of transformers.

Customers with a fleet of existing transformers can be upgraded to a “TXpert enabled transformer” by using “TXpert ready sensors” connected to the TXpert Hub. Alternatively, new Hitachi Energy transformers can come pre-equipped with TXpert Hub. Hitachi Energy also offers service contracts boosted by our Luma-da Asset Performance Management (APM) software, supporting our customers to interpret their data and take action when needed.

TXpert reduces both costs and risk by constant monitoring; coupled with advance warning of potential threats. The actionable intelligence delivered by TXpert can result in 50 percent lower risk of serious failures, 60 percent reduction in revenue loss due to unanticipated problems / outages, and 75 percent reduction in repair costs due to early detection.

The TXpert Ecosystem is applicable for all transformer applications across the energy value chain – generation, transmission, distribution, industries, and infrastructure.

Peace of mind - tap-changer and bushing maintenance packages

The typical operational life of a transformer is estimated at 35 years; as an essential asset in every substation, attention to its upkeep and regular maintenance is imperative. According to Cigre (2015), 31 percent and 18 percent of transformer failures arise from tap-changer and bushings issues, respectively. As an OEM bushing and tap-changer manufacturer, Hitachi Energy supports its customers through its deep domain knowledge, condition-based assess-

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ments, advanced diagnostic methods, and experienced personnel.

Hence, the company has created pre-defined tap-changer and bushing maintenance packages and service contracts for asset managers' convenience as part of the TXLife service bundles.

With the aim to maximize transformer operational life by evaluating bushing and tap-changers' condition, Hitachi Energy's team of experts provide relevant know-how and the appropriate service plan to keep tap-changers updated and in excellent condition.

The TXLife Transformer Replacement packages help in the environmentally safe disposal and recycling of aged transformers while providing a matching replacement design, thus ensuring practical, sustainable solutions. Hitachi Energy's specialist teams conduct feasibility studies and can assist with retrofitting, upgrading and the disposal and dismantling of old units in an environmentally appropriate manner.

Hitachi Energy's commitment to enabling its partners to build and operate more sustainable and digital transformers

Strategic changes to transformers and their components' design can minimize electricity losses and reduce the environmental impact of the power grid. One of the most important ways that transformers can be more sustainable, and resource-efficient is by implementing technology that reduces their failure rate increases maintenance intervals and expands their lifespan.

Humanity is facing global challenges which require global solutions; climate change and despoiling of ecosystems are key examples connected to the electricity industry. As technology and market leaders, we have an obligation to find solutions and enact them, as Hitachi Energy attempts to do in leading by example.

Going forward, higher levels of electrification will significantly enhance sustainability in the world's energy systems.

Author



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