IEEE PES Transformers Committee
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Optimizing Efficiency of Transformer Cores to Meet DOE 2029

— Technical Presentation —
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1. Abstract

Distribution transformers are required to improve their efficiency, pushed by different regulations worldwide, specifically in the U.S. from the Department of Energy (DOE) as per new energy efficiency rules which take effect in 2029. Core material is an important factor to be considered, along with processing equipment to ensure the optimization of higher performance materials and a process which will allow measuring and monitoring of no-load losses (also referred to as core losses).

This panel examines several factors to support transformer manufacturers on their path towards designing higher efficiency transformers to meet the new DOE regulations.

2. Learning Objectives

This tutorial provides the following learning opportunities:

- Innovation exchange: Join a dynamic tutorial where technical innovations are shared.
- Synergistic solutions: Experience firsthand synergies of grain-oriented electrical steel (GOES), advanced processing techniques and cutting-edge testing methods, designed to optimize your operations and enhance your products.
- Strategic Impact: Engage in discussions that not only address the challenges of today but also pave the way for a sustainable, greener world through informed strategies and impactful investments.

3. Learning Outcomes

By attending this tutorial, attendees will gain an understanding of the following:

- Sustainability Roadmap: Discover how all of us can contribute to a greener, more sustainable world and learn about the strategies that are making this vision a reality.
- Regulatory Guidance: Stay ahead of the curve with a detailed roadmap to meet the upcoming DOE regulations, informed by our successful experiences with Europe's Ecodesign directives.

4. Presenters' Biographies

Ales Bertuzzi has worked in the transformer industry since 1991. After completing his technical education, he started working at his family-owned company in Italy. Over the years, he held various roles, including sales manager and general manager, thanks to his language skills and interest in strategic marketing and negotiations.

In 2007, he expanded the company's business to international markets and later sold the company. Ales developed an alliance of companies to work at a process level and holds a patent on a revolutionary core manufacturing process called TWINCORE, which aims to increase core filling factor and productivity in distribution transformers. He then founded his own company, Transformer Process, collaborating with leading German machine manufacturers. Currently, Ales Bertuzzi is the vice president of sales for GEORG Transformer Division in North America.

Stefan Siebert is the managing director of Brockhaus Messtechnik GmbH & Co., a company specializing in the manufacture of data processing devices, electronic and optical products. He has been actively involved in the company's leadership.

Stefan has made significant contributions to the field of magnetic materials and their measurement technologies. Here are some of his notable achievements:

1. Development of advanced measurement systems: Stefan has been instrumental in developing advanced measurement systems for characterizing the magnetic properties of soft and hard magnetic materials used in electric motors. These systems help in evaluating and optimizing the performance of electric motor components.
2. Coil mapping system: He played a key role in the development of the EBA-CoilMap system, which provides continuous monitoring of local variations in magnetic properties across the material width and length of electrical steel coils. This system helps in identifying low-quality areas within a coil and optimizing production processes.
3. Research on manufacturing processes: Stefan has conducted research on the influence of manufacturing processes, such as stamping and welding, on the magnetic properties of stator cores. His work has helped in understanding the detrimental effects of these processes on power loss and permeability, leading to improvements in electric motor performance.
4. Publications and presentations: Stefan has been actively involved in presenting his research findings at conferences and publishing papers on magnetic measurements and their impact on electric motor performance.