

## TRANSFORMERS MAGAZINE

ISSN 1849-3319 (Print) ISSN 1849-7268 (Digital)

## EDITORIAL BOARD

## Editor-in-Chief:

Mladen Banovic, PhD, Merit Services Int., Croatia  
mladen.banovic@transformers-magazine.com

## EXECUTIVE EDITORS

Michel Duval, PhD, Hydro Quebec, Canada

Jean Sanchez, PhD, EDF, France

Michael Krüger, PhD, OMICRON electronics, Austria

Jin Sim, Jin Sim &amp; Associates, Inc., USA

Juliano Montanha, SIEMENS, Brazil

Craig Adams, TRAFIX, Australia

Arne Petersen, Consulting engineer, Australia

Zhao Yongzhi, Shandong Electrical Engineering &amp; Equipment Group Co., Ltd, China

Barry M. Mirzaei, LargePowerTransformers Inc., Canada

Bhabha P. Das, PhD, Dynamic Ratings Australia, New Zealand

## EDITORS

Daosheng Liu, Jiangxi University of Science and Technology, China

Mislav Trbusic, University of Maribor, Slovenia

Dr. Mohammad Yazdani-Asrami, University of Strathclyde, United Kingdom

Dr. Shuhong Wang, Xi'an Jiaotong University, China

Nam Tran Nguyen, PhD, TT Electronics, USA

## ASSISTANT EDITOR

Pedro Henrique Aquino Barra, MSc,  
EESC/USP - University of São Paulo, Brazil

Art Director: Momir Blazek

Photo: Shutterstock.com

Front page image: Hitachi Energy

Language Editor: Ena Tomičić

## ADVERTISING AND SUBSCRIPTION

+385 1 7899 507

sales@merit-media.com

## SUBSCRIPTION RATES:

**Print edition: \$130** (1 year, 4 issues)**Digital edition: \$65** (1 year, 4 issues)**Online edition - full access: \$20** (1 year, 4 issues)**Online edition - free access:** free of charge for registered users

www.transformers-magazine.com

## TRANSFORMERS MAGAZINE

Transformers Magazine is published quarterly by Merit Media Int. d.o.o., Setaliste 150. brigade 10, 10 090 Zagreb, Croatia. Published articles do not represent official position of Merit Media Int. d.o.o. Merit Media Int. d.o.o. is not responsible for the content. The responsibility for articles rests upon the authors, and the responsibility for ads rests upon advertisers. Manuscripts, photos and other submitted documents are not returned.

## REPRINT

Libraries are permitted to photocopy for the private use of patrons. Abstracting is permitted with credit to the source. A per-copy fee must be paid to the Publisher, contact Subscription. For other copying or republication permissions, contact Subscription. All rights reserved. Publisher: Merit Media Int. d.o.o.

Setaliste 150. brigade 10,

10 090 Zagreb, Croatia

Contact: +385 1 7899 507

VAT number: HR09122628912

www.transformers-magazine.com

Bank name: Revolut

Bank IBAN: LT343250038251836452

SWIFT / BIC: REVOLT21

Intermediary BIC: CHASDEFX

Director: Mladen Banovic, PhD



## Dear readers,

This edition of Transformers Magazine presents an insightful exploration of industry advancements, innovative solutions, and key market trends that are shaping the global transformer sector. A comprehensive overview of the industry's current landscape and future directions is provided through a variety of interviews, technical articles, and expert columns.

We begin with exclusive interviews with respected industry leaders. Gordan Kolak, CEO of KONČAR Group, shares the company's strategic initiatives for 2024, highlighting the key trends and developments that will shape its future direction. Alberto Cracco, CEO of Westrafo, provides insights into the establishment of a global transformer company, emphasising investments in sustainable energy and the company's strategic expansion into the US market. Juan Pedro Gracia, Global Renewables Segment Leader at Hitachi Energy Transformers, provides valuable insights into the role of transformer technology in the integration of renewable energy and addresses the challenges and opportunities presented by the transition to a sustainable grid.

### With the growing importance of offshore wind farms, the need for efficient transformers that can withstand the harsh marine conditions has become a priority

In this edition's expert columns, we are pleased to welcome Jim Dukarm, who presents a fresh perspective on dissolved gas analysis, showing how a scientific approach can transform this art into a precise diagnostic tool. Meanwhile, Vitaly Gurin and Marius Grisar's ongoing analysis of the statistical scattering of transformer oil breakdown voltages continues with a focus on area and volume effects, revealing new perspectives on insulation performance and reliability.

This edition also features articles that push the boundaries of transformer innovation.

One of the most pressing topics in this edition is the role of wind power in accelerating the journey to net zero. With the growing importance of offshore wind farms as a key component of the renewable energy landscape, the need for transformers that can withstand the harsh marine conditions while ensuring efficient energy transmission has become a priority. The focus on resilient transformer design is also of great significance, with a particular emphasis on solutions that enhance reliability in extreme weather conditions, improve noise reduction, and optimise safety in modern power systems.

The industry's shift towards intelligent transformer solutions is another central theme. The integration of IoT-enabled monitoring and sustainable designs is redefining transformer operations, enabling better asset management, predictive maintenance, and enhanced efficiency. These technological advancements contribute to a more responsive and adaptive grid, ensuring reliability in an era of fluctuating energy demand.

### In modern power systems, the focus is on resilient transformer design, reliable in extreme weather conditions, with reduced noise, and optimised safety

Sustainability remains a key priority in current discussions, with the emergence of bio-based ester fluids as a significant innovation in transformer insulation being particularly noteworthy. These advanced fluids offer enhanced fire safety, extended transformer lifespan and a reduced environmental footprint, positioning them as a compelling alternative for the next generation of power grid solutions. The edition also covers new industry collaborations that aim to strengthen global supply chains and facilitate the distribution of high-performance components.

From a technical perspective, this issue explores digital innovations that are enhancing transformer performance. Algorithms are transforming capacity utilisation, enabling transformers to operate more efficiently without exceeding thermal limits. This advancement not only increases operational flexibility but also contributes to significant reductions in material use and CO<sub>2</sub> emissions. The life cycle of dry-type distribution transformers is also examined, offering a comprehensive look at how sustainable practices can be integrated from design to disposal, thus minimising environmental impact.

As the energy sector undergoes rapid transformation, this edition provides essential perspectives on the technologies and strategies driving the future of power grids. By embracing innovation, collaboration, and sustainability, the industry is paving the way for a more resilient and efficient electrical infrastructure. I hope you enjoy reading it.

Sincerely yours,

Mladen Banovic, PhD

Editor-in-Chief, *Transformers Magazine*