

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, Utility, France
Jin Sim, Jin Sim & Associates, Inc., USA
Juliano Montanha, SIEMENS, Brazil
Craig Adams, TRAFIX, Australia
Arne Petersen, AP Consulting, Australia
Michael Krüger, OMICRON electronics GmbH, Austria
Zhao Yongzhi, Shandong Electrical Engineering & Equipment Group Co., Ltd, China
Barry M. Mirzaei, LargePowerTransformers Inc., Canada

Art Director: Momir Blazek
Photo: Shutterstock.com
Cover image by M&I Materials
Language Editor: Marina C. Williams

ADVERTISING AND SUBSCRIPTION

Marin A. Dugandzic
+44 20 373 474 69
marin.dugandzic@merit-media.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 don't 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.

Subscription rates:

Print edition: \$115 (1 year, 4 issues)
Digital edition: \$54 (1 year, 4 issues)
Online edition - full access: \$19 (1 year, 4 issues)
Online edition - free access: free of charge for registered users
www.transformers-magazine.com

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
Contact: +44 20 373 474 69 UK
VAT number: HR09122628912
www.transformers-magazine.com
Bank name: Zagrebacka banka
Bank identifier code: ZABHR2X
Bank IBAN: HR8023600001102375121
Director: Ana Jelcic



Dear Readers,

2017 was a very dynamic year, both in terms of technology and business.

If we talk about technological advancements, a development that stands out is definitely the news about successful testing of the 1,100 kV DC converter transformers at Siemens and ABB. Both transformers were developed and manufactured for the sending and receiving stations of the Changji-Guquan UHVDC link in China, which will be able to transmit 12 GW of electricity over the distance of 3,284 kilometres from Xinjiang region in the Northwest to Anhui province in the east – a project worth \$10 billion. Transformers Magazine has been following the progress of this project, reporting regularly on new developments, and I have been honoured to personally see the production of one of the first units to be installed at the Changji sending station, considering how advanced and complex these units are. Interestingly enough, while most economies would be looking at ways to maximally use the new, recently developed technology, the Chinese are already contemplating how to advance to 1,500 kV DC! This is the mentality of growth which is also behind the efforts to develop the Internet of Things, which we also wrote about in our earlier editions (see the Interview with Zhou Xiong in Vol 3, Issue 1).

Last year we also saw some important developments in design aiming to improve the resilience and safety of the network through the development of bullet resistant transformers, and mobile pluggable transformers to bypass failed units. It is also worth mentioning the advancements in the development of low cost monitoring systems for distribution transformers,

transformer protection against space weather, development of transformers for tidal electricity generation, etc.

Looking at business developments over the last year, we can see that the market is becoming quite consolidated.

ABB is consolidating its transformer production in Poland, moving even the traction transformers production from Geneva, Switzerland to its Polish facility in Lodz. In the United States, the company will discontinue production in St. Louis, Missouri and will consolidate power transformers manufacturing in South Boston and Crystal Springs. Last April, the company closed its distribution transformer factory in New Plymouth, New Zealand, moving the production to Vietnam. Across the ocean, they opened a new traction transformers facility in Johannesburg, South Africa.

ABB also announced the acquisition of GE Industrial Solutions. This business would also include distribution and dry-type transformers.

SGB-SMIT has been taken over by One Equity Partners after the sale to China's State Grid and a merger with Schneider Electric both fell through. Recently we also reported that SGB-SMIT formed a consortium with Power Matla Group and acquired an 80 % stake in Powertech Transformers, South Africa's largest transformer manufacturer, from Allied Electronics Corporation Limited (Altron).

At the end of the last year, GE announced it will be closing its Moenchengladbach transformer manufacturing plant in Germany in 2019. Siemens acquired Infolytica, the vendor of simulation software, while Doble (ESCO) welcomed Morgan Schaffer and Vanguard as new subsidiaries.



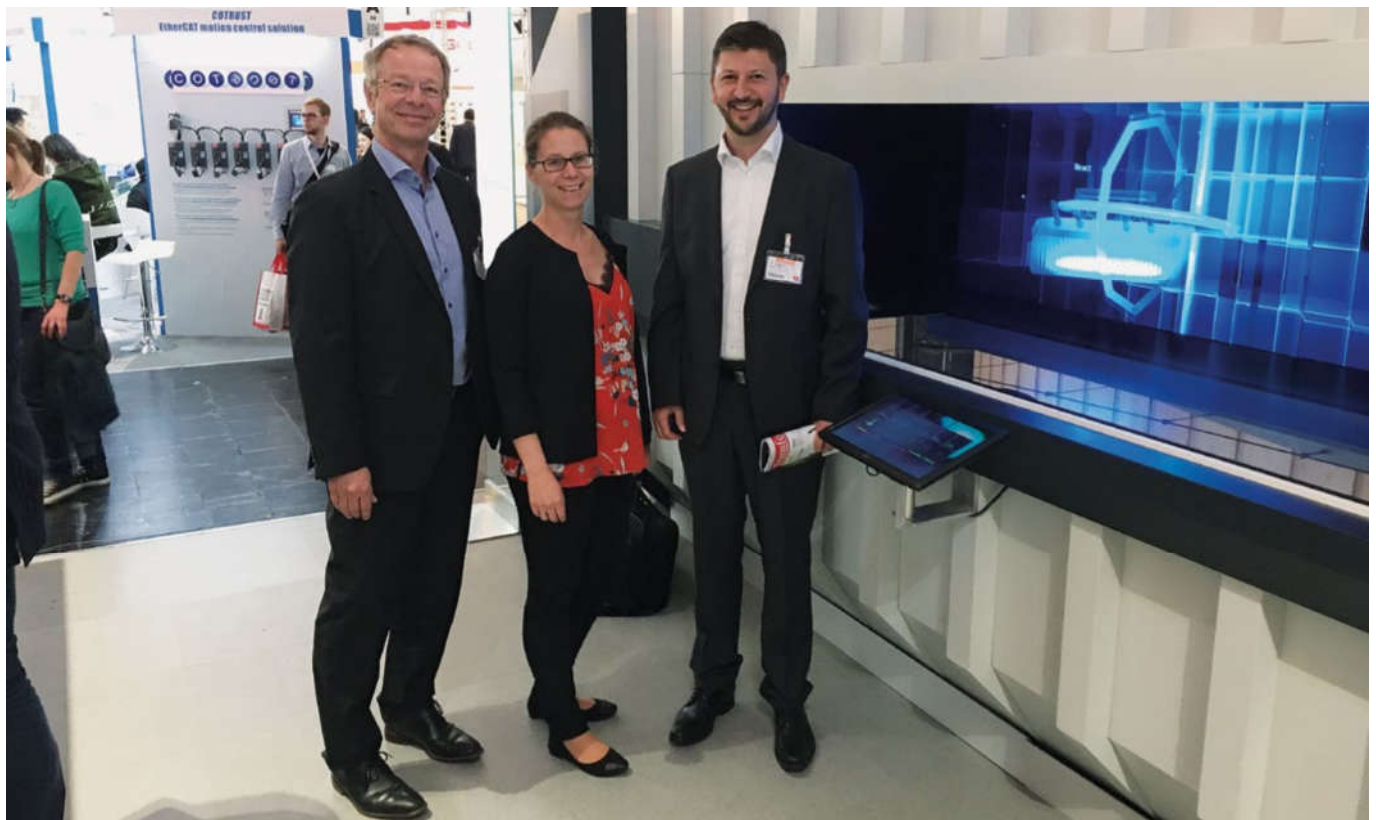
World's first $\pm 1,100$ kV transformer developed and manufactured for the Changji-Guquan UHVDC link in China (Photo credit: www.siemens.com/press)

Steel producer Thyssenkrupp and Tata Steel made a preliminary agreement to merge their European steel operations, which will position them as Europe's No.2

steel producer after ArcelorMittal.

It should be noted there were several local producers that managed to invest into

acquisitions and production expansion, owing to their strong position in the local market as well as their competitiveness and flexibility.



Hannover fair, Siemens booth, April 2017. From left: Tomas Arenius (Transformers Magazine EMEA), Dr. Emily Abold (Siemens Transformers), Mladen Banovic



Weidmann seminar, Wuhan, China, October 2017. From left: Mladen Banovic and Jason Song (Transformers Magazine China)

articles on a range of relevant topics in the industry – from new trends in technology and market, through the components and transformer testing and diagnostics, to insulation materials and examples from field experiences, brought in a very interesting success case story. I hope you will enjoy this content and perhaps opt to present some of your research and experiences to our global readership. Experts with long-time experience have an opportunity for a regular presence in the magazine by becoming our columnists. An overwhelming impression that most of our authors have shared with us is that they found the publication process and publishing experience with us very inspiring. All you need to do is contact us and we will guide you through the process.

I wish you a fruitful New Year!

Mladen Banovic, Editor-in-Chief

We open this edition of the magazine with an interview with an executive from one of the Europe's largest transmission operator companies, and an interview

with one of the leading manufacturers of magnet wire used in transformers. The interviews are followed by three regular columns and a wide selection of

Think about the environment while developing, manufacturing and operating transformers.