

TRANSFORMERS MAGAZINE

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Dear Readers,

At the moment of writing this Editorial message, we are approaching the end of 2016, and I would like to summarize most important facts from 2016 and share with you some updates and likely scenarios for the near future.

The Transformers Magazine team has worked throughout the year aiming to bring relevant public information to our community. We participated at fairs, conferences, international working groups and paid visits to our customers, meeting people from all parts of the world, from Australia to Canada and from South America to Korea. A few photos included in this message illustrate this. In total, we have published roughly 800 transformers-related news items in 2016.

From all the novelties we have seen, I would single out the world's first 1,100 kV DC power link to be built in China, for which converter transformers have been ordered from Siemens and ABB. We have also witnessed a solid progress of resilience transformers, particularly in the U.S. The concept of pluggable transformers has progressed to the point where it has the potential to redefine how we use transformers. You can learn more about this concept in one of the interviews in this issue.

In the field of tap-changers we have seen also a lot of improvements, promising a matured technology for distribution transformers, and bringing some completely new concepts for power transformers, such as direct drive, enhanced switching, etc.

As far as materials are concerned, it is definitely worth mentioning the cellulose paper which ensures the system

thermal class of 130 °C in mineral oil and 140 °C in ester liquid.

The concept of Industry 4.0 has marked a new phase in manufacturing technology, offering more automation, precise and more accurate manufacturing processes, better quality assurance by integrating in-line measurements, etc. We can expect to see penetration of this concept in transformer manufacturing processes, particularly core cutting and stacking, winding, etc. We have also published information about solutions for quality brazing using innovative methods; measures to ensure longevity of transformer tanks and other constructions for the harshest environmental conditions, etc.

This year we have seen a high-temperature superconducting transformer successfully designed and tested in New Zealand, but we are yet to see a solution which would be usable in practice.

For anyone who needs more convincing, it is high time we all noted that safety (physical, but also cyber safety) is of the utmost importance for end users. They will not only expect EPC companies, substation builders and special solution providers to make their transformers safer, but also transformer manufacturers will be required to provide safer and more robust transformers. Some transformer OEMs have already made such transformers available in their offering.

Businesswise, 2016 was not as successful in mergers and acquisitions as was 2015, which was marked by the acquisition of Alstom by GE, as the most remarkable example. In 2016 we saw some smaller M&As, but also some unsuccessful attempts, such as that of CG,



who in the end failed to sell their overseas power business, or Tata Steel's failure to sell its UK-based business just as yet.

In 2016 we informed about nearly 60 different transformer market related reports. Some of the reports analyse particular types of transformers, others inspect transformer components or materials. The problem with these reports is that there is a noticeable discrepancy among them. For example, one of the recently published reports assesses the global power transformer market in 2016 at \$33.4 billion, while another forecasts reaching that level in 5 to 6 years from now. To shed more light on these ambiguities, an esteemed expert in this field, Steve Aubertin, in his column dedicated to transformer market provides more insight into the current market trends.

This issue of Transformers Magazine brings an overview of most important recent news, and features three interviews, four columns, and several technical articles and advertorials.

In this issue, the magazine is introducing two new columns. One is dedicated to transformer monitoring, a flourishing area today, and I am glad to introduce to our readers a contribution by a renowned expert in the field, Dr. Tony McGrail from Doble.

The other, by Dr. Jos Wetzer from DNV GL, former KEMA, will focus on transformer lifecycle. The first contribution discusses the stage in the transformer lifetime where most of transformer failures origin – the pre-service stage.

I encourage you to send any comments on columns, or any other materials that we publish either to me or directly to the respective author.

All of the materials presented provide a lot of technical and business-related content, which I hope you will enjoy.

Have a pleasant reading and a successful 2017!

Mladen Banovic, Editor-in-Chief



Mladen Banovic moderating MY TRANSFO conference in Turin, Italy, November 2016
In the picture, from left to right: Vander Tumiatti, Founder of Sea Marconi and President of MY TRANSFO (Italy); Mladen Banovic, Editor-in-Chief of Transformers Magazine (Croatia); Jimmy Rasco, Vice President-Global Base Oil Technology at Ergon (USA); Tom Larney, Director at Electrical Oil Services (UK); Carl Wolmarans, Development Engineer at Nynas (Sweden)



Transformers Magazine team at the International Workshop on Power Transformers, Equipment, Substations and Materials in Recife, Brazil, November 2016
In the picture, from left to right: Wilson de Andrade, Regional Market Manager at Transformers Magazine (Brazil) and Marin A. Dugandzic, Director of Sales and Marketing at Transformers Magazine (Croatia)



Transformers Magazine team (Mladen Banovic, Jason Song and George Jiang) visited SPECO, world's largest transformer factory, in Jinan, China, for the second time in one year, October 2016