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Dear readers,

This issue dedicated to new trends arrives with perfect timing. After the past two drought years, so to speak, we are finally seeing a rising trend in new innovations. For some of those I have wondered how come they have not turned up even sooner.

In this interview, **Stephane Schaal** of Hitachi Energy discusses in detail some major trends, primarily with regards to energy efficiency standards, decarbonization and digitalization, which now shape our industry and will continue to do so for a long time. One of his conclusions is that *only the most agile and innovative players will be able to transform the challenges into opportunities.*

Among the significant and noteworthy innovations mentioned by S. Schaal, I would like to emphasise Hitachi Energy's CompactCool™ technology, blending dry and liquid cooling transformer technologies, which was extensively reported by Transformers Magazine in the April 2022 edition.

Another major innovation I would especially highlight here is related with Narrowband Dielectric Frequency Response, which is basically DF/PF testing at 1 Hz (in addition to a test at line frequency), described by **Diego Robalino** et al. of Megger.

A new important product to mention is certainly presspaper DDP-Xtherm 140, designed for liquid-filled transformers used in wind and solar applications, designed to withstand harsh conditions. The related article by **Helmut Bockshammer** of Hitachi Energy includes a lot of other useful details. I must admit that I still find this topic particularly interesting, as some ten years ago I worked in the former ABB, in insulation and components product group.

Furthermore, another thing especially worth emphasising, as one of the innovations I would expect to turn up much earlier, is CAREPOLE – a dry-type cast-resin pole-mounted transformer from Siemens Energy. These are practically the smallest transformers used in the distribution of electricity. Up until now, those have always been liquid-filled transformers, however, now they are also available in a dry-type version. This topic will be covered in the upcoming issues of the magazine.



In any case, these are all extremely valuable innovations, and it is highly expected that the market will recognise and accept them.

In brief, this edition brings two interviews, four columns, and no less than eight articles. In addition to the already mentioned interview with Stephane Schaal, I also recommend the interview with **Joy Ditto**, President and CEO of the American Public Power Association.

Of our regular columnists, this edition features articles by **Vitaly Gurin**, **Marius Grisaru**, **P. Ramachandran**, and **Tony McGrail**.

The remaining articles deal with the following topics: physical security, temperature detection and reduction, diagnostics related to exciting current and power factor, transformer components, varistors, monitoring of sealed transformers, and monitoring of transformer transport.

Finally, what can we expect from all these new trends and innovations? Systemic development is impossible without a good vision, and here I would like to add one particularly good vision, also from the interview with Stephane Schaal:

It is interesting to observe that the power distribution grid is characterized by more and more DC generation and, at the same time, more and more DC consumption. In this context, one may reconsider the process of converting electricity from DC to AC for transmitting it from the point of generation to the point of consumption and then again converting it from AC to DC for consumption. Going forward, it may become viable to overcome this repeated conversion process by replacing the MVAC grid with a possibly more energy efficient MVDC grid. This is a vision that requires investing in innovation, leveraging technologies like solid-state transformers, including power electronics, artificial intelligence, additive manufacturing and software, among others.

I hope you will find a wealth of useful information in this edition, perhaps even ideas for new innovations. 😊

Mladen Banovic, Editor-in-Chief



Dr. Mohammad Yazdani-Asrami

Dr. Mohammad Yazdani-Asrami holds a PhD in electrical power engineering. He spent the last 12 years on research works and projects related to transformers, electric machines, and harmonics in four different countries, including Iran, Italy, New Zealand, and the UK. His transformer related research was focused on hot spot temperature determination and loss evaluation of conventional transformers under voltage and current harmonics, as well as optimal design of transformers for power and high frequencies. He also worked on a project for the design development and fabrication of a fault-tolerant superconducting transformer at Robinson Research Institute, Victoria University of Wellington, New Zealand, which holds the world record on fault withstanding time for HTS transformers. His current research interests are electromagnetic design and development of conventional and superconducting electrical machines such as superconducting transformers, fault current limiters, and permanent magnet machines for terrestrial power network and aircraft applications. He is currently working as „lecturer in electrically powered aircraft and operations“ at University of Glasgow, Glasgow, United Kingdom.

He is a member of IEEE (MIEEE), member of IET (MIET), member of British Cryogenic Council (BCC), member of Cryogenic Society of America (CSA). He is editor at Transformers Magazine (TM). He also served as guest editor for several special issues in „IEEE Transactions on Applied Superconductivity“ and „Superconductor Science and Technology“ journals.



Saqib Saed

Saqib Saed is the Executive Director of Research and Consulting at Power Technology Research. Coming from an industry background, Saqib currently leads research teams in developing coherent methodologies for PTR's syndicated services and custom consulting projects for various clients across North America, Europe, and Japan.

He has been involved in the power sector for more than 10 years now working with T&D Equipment OEMs and utilities to conduct online and offline market research and identify business opportunities for market segments including HVDC, FACTS, power / distribution transformers, gas insulated substations and EV charging infrastructure. Prior to founding PTR, Mr. Saed has worked as a maintenance engineer at a large fertilizer plant looking after the secondary distribution network incl. transformers. He holds a master's degree in power engineering from the Technical University of Munich (TUM).



Bubathi Muruganatham

Bubathi Muruganatham acquired a BE degree (electrical engineering) in from Anna University India in 2007 and a PhD (engineering science) from Homi Bhabha National Institute, India (Indira Gandhi Centre for Atomic Research, Kalpakkam) in 2013.

Currently, he is working as a Lead Engineer in Eaton Research Labs at Eaton India Innovation Centre, Pune, developing prognostic and health monitoring solutions for electrical and aerospace business. Previously, he has worked with GE Global Research Centre, Bangalore and ONYX Insight, Chennai. Overall, he has 8 years of work experience and 7 years in the domain of Industry 4.0.

His expertise includes condition monitoring of electrical and mechanical systems, signal processing and machine learning.



Dinesh Iyappan

Dinesh Iyappan is fascinated by the true gift of humanity - electricity, which has performed wonders in making life much easier. His interest in concept of electro-magnetism grew more when he encountered electrical machines during his college days. Soon after getting his bachelor's degree in electrical and electronics engineering, he started his career with a leading transformer manufacturing company Prolec GE.

Dinesh is currently a Commercial Engineer working with Indo Tech Transformers Limited. He has acquired experience in transformer industry for the past 4 years. He is a professional energetic electrical and electronics engineer with the ability to identify opportunities, result-oriented, effective communicator and a good team player.

He was in transformer design and proposals in his early 2 and half years for his professional carrier where he was involved in projects globally with ratings of up to 100 MVA 220 kV. He has expertise in design optimization, tender cost estimation and selection of transformer fittings and accessories. He is now in a sales and marketing role with the area of expertise in pre-sales technicalcommercial assistance, product education, market analysis and forecasting.

He is passionate about keeping himself updated with the current trends in the transformer industry. He is pursuing data science during his leisure time. He likes to volunteer for serving the needy. He also loves networking with like-minded peers and industry professionals. His hobby is playing Football, chess and public speaking.