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1. Please, tell us a little bit about yourself.

You could say I was born into the Hitachi ABB Power Grids world, which for many of us is much more than a job, it really does feel like a family. I joined after leaving the university and have now completed more than 23 years. I consider myself very fortunate to have been given the opportunity to work across the globe in different roles and teams from many of our 60 transformer factories and 30 service centers. This has also allowed me to meet many of our customers and learn from their challenges and needs.

2. You have mentioned customers' needs, how have you seen those needs changing during your time in the transformer industry?

The core needs of a reliable and dependable infrastructure have not changed, but you can see the expectations of power consumers are continually increasing, and any problem a TSO or DSO may have can cause major consequences for modern industrial processes or quickly become exposed and criticized via social media. On a more positive front, both consumers and network operators are increasingly living in the knowledge-based economy, looking to educate themselves with respect to the energy they are using, how it is produced and how they can prevent waste.

The general consumption of electricity has been increasing over time, but with the switch to renewable sources, there have been both an increase in the demand as well as changes in the grid dynamics with power flows, changing from bulk unidirectional models to distributed generation and now even to virtual power plants.

3. Renewables are a hot topic, what does this mean for transformers?

Renewables are a broad topic themselves. At the utility level, there are significant investments in large-scale wind parks, many of which are offshore. These represent benefits of a more consistent power availability but bring many challenges with respect to the environmental conditions and focus on low size and weight, not to mention transportation and maintenance. Solar is also showing dramatic levels of investment, so we expect to see many more "prosumers" and virtual power plants I mentioned, bringing along the need for managing high levels of flexibility, re-dis-

patches and maintaining the power quality.

4. What part does technology, in particular digitalization, play in meeting those challenges?

Technology makes a big difference. Right from the base concept, it is vital to be able to use state-of-the-art tools for simulation and validation of any design. This is not unique to renewables, but those working in the renewables business areas are typically looking to push innovation and benefit from best-in-class technology. Hitachi ABB Power Grids are world leaders not only in terms of design tools and monitoring options but also in the validation models and tools available to interpret a transformer's condition and potential overload. Digital Twins are now becoming fashionable, but this is something we have been doing for many years.

A technology sector where we are very active is data centers, and this is another demanding technology segment where

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any small problem is seen by thousands if not millions of consumers. This segment is another example that we have been particularly successful, as unplanned outages are not an option and the consumers are keen to ensure they have the best possible insights into the condition of their assets and how they are operating.

5. You have mentioned insights. How does this differ from monitoring?

Sensing, monitoring and converting electrical signals into data points are not new, even in the power industry, however the data points themselves bring a limited value and if unchecked they may even create a fog of data when trying to find the most important parameters at a particular point in time. The value comes not from a digitized information source, but from the digitalization of an operation or process to achieve a goal. The value will typically improve with multiple sources of information and the interpretation of what this combination

or trend really means. Hence the importance of not just lots of data, but the domain knowledge to turn all this data into insights that enable better decision making – as the saying goes, “in order to make an informed decision, first you must be informed.”

6. What does this mean in practical terms?

First and foremost, any solution needs to be forward-thinking, i.e. able to meet the needs not just from changing generation sources, but also loading profiles and power flows. As most transformer focused solutions are stand-alone today, they need to be able to provide insights into the trends we are already seeing, but also flexible enough to accommodate future needs both in terms of an increased number and performance of field or sensor level devices, and also upstream connectivity. Any digital ecosystem needs to be much broader than just an aggregator bolted onto a transformer. It needs to be considered a hub that itself forms part of a wider substation or fleet, and it must

work seamlessly with higher-level systems. This is a vehicle to provide asset owners and operators with an insight to make decisions regarding the asset utilization or prioritization of maintenance investments. Hitachi ABB Power Grids tools are already able to provide operators with prescriptive insights into what actions should be completed in which timeframe, at an attractive price point.

7. This all sounds good, but what does it mean for those who are affected?

People are and will remain at the core of any successful business. The above-mentioned tools bridge the gap between IT and OT, enhancing decision-making and support an industry which is currently experiencing a generation change and struggling to attract new talent. From a Hitachi ABB Power Grids perspective, it means we are growing and at the same time providing career paths for colleagues to combine their many years of transformer knowledge with state-of-the-art digital technologies. We are very proud of having both local and global digital teams, supporting the sales and technical side of the business.

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