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Distributed *LINK*-based operational architecture – The foundation of power systems of the new electricity age

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Traditional power system architecture has enabled, for more than a century, a reliable, stable and efficient grid operation. However the rise of distributed generation and the usage of the volatile energy resources like wind and photo voltaic have created big operation challenges on all parts of grids: i.e. in distribution as well as in transmission. The coordinated operation of the transmission and distribution grid has now become more and more difficult. *LINK*-based architecture is a new technical-functional architecture that overcomes challenges, which are induced by the integration of the distributed generation. This new architecture is derived from the “Energy Supply Chain Net” holistic model of power systems and the *LINK*-Paradigm. Having a standardized structure, *LINK*-Paradigm can be applied to any partition of power system: Electricity production entity, storage entity, grid or even the customer plant. From this paradigm are derived three architecture components: The “Grid-Link”, the “Producer-Link” and the “Storage-Link”. Each of them has its own operator Grid- or system operator, producer operator and storage operator respectively. The distributed *LINK*-based architecture is designed on the basis of these three components. The new architecture allows a flat business structure across the electrical industry, which facilitates a holistic power market model. It minimizes the amount of the data, which needs to be exchanged. The interfaces between the all three architecture components are well defined. The minimum of exchanged data are extracted from power system operation processes. The *LINK*-based architecture is in compliance with high requirements of data privacy and narrows cyber attacks down.

Biography

Albana Ilo, after completing her PhD, was with Siemens AG Austria. She has been working as an Expert and Project Lead in many research, development and implementation projects. Distributed generation integration and their effects on transmission and distribution networks are her research interests. Her holistic model of power systems, which includes customer plants, were crucial to her promotion to Principal Key Expert Consultant. Since October 2013, she is employed at TU Wien and is responsible for Smart Grids from Power Grid point of view. In addition, she was an Independent Expert Reviewer near the EU commission, Energy Sector.

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