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Transformation of the Grid – A Transmission Efficiency Perspective

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Abstract

Restructuring and regulatory changes, proliferation of renewable resources, and integration of smart grid technologies are the key drivers of the transformation of the electric utility industry. These trends are driving the need for higher system efficiency including more optimal utilization of the grid resources. This presentation highlights various stages of this transformation and underscores how the need for higher efficiency is pushing the grid closer to its edge. It is observed that an ideal mix of smart grid resources such as demand response and storage leads to a flatter net demand that eventually accentuates congestion resulting in the grid being operated at its edge more often and in more locations. Thus more advanced methodologies are needed for on-line determination of the grid edge and for enabling operation of the grid closer to its limits. Some recent advances in this area will be presented and their respective methodologies and approaches will be discussed.