

The transmission of the future: the impact of Distributed Energy Resources on the network

J.I. Pérez Arriaga

Abstract-

The Massachusetts Institute of Technology (MIT) study «The Future of the Electric Grid,» published in December 2011, examined challenges for power systems and concluded with a number of findings and recommendations. The study carefully separated recommendations for transmission from those meant for distribution. Transmission analysis focused on the lack of comprehensive planning at interconnected system levels, siting governance shortcomings, new technologies to enhance grid observability and security, and cybersecurity issues. It also stressed the additional flexibility requirements imposed by the growing presence of intermittent wind and solar generation in the generation mix. At the distribution level, in addition to concerns related to privacy and cybersecurity, recommendations focused on the need for a transition to dynamic pricing for end consumers, promotion of innovation in network design and management, data availability and ownership, and tariff reforms to support distribution network cost recovery.

Index Terms- Electricity supply industry; Energy resources; Load flow; Power distribution; Power generation; Power grids; Power system economics; Power system planning; Substations

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