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# Identification and Mitigation of Ferranti Effect on High Voltage Transmission Lines for Power Systems Reliability Improvement

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## Abstract

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Power systems reliability is a function of transmission line performance. External as well as internal factors influence the ability of transmission lines to transport electrical energy as expected when demanded. External factors such as weather-related events are well investigated and documented in modern scientific and technological databases but same is not true for factors which result from the intrinsic physical properties of conductors such as Ferranti effect. The Ferranti effect is a phenomenon occurring in long continuous transmission lines carrying high voltages whereby the receiving end voltage is greater than the sending end voltage such that it could be undesirably up to an amount that the survivability of the power system is threatened, or further protection devices are required, or maintenance action is needed. A holistic approach to power systems reliability means that research effort must be devoted to fill identified critical gaps by extending investigations to these neglected factors. This paper seeks to establish the importance of Ferranti effect in the overarching reliability objective associated with electrical energy dispatch from the point of generation to the point where the energy is utilized by consumers, and it further proposes a mitigating scheme that deploys the use of shunt reactors overvoltage suppression devices.

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