

System Security Impact on the Dynamic Characteristics of Measurement Sensors in Smart Grids

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Abstract : Smart grid is a term used to describe the next generation power grid. New challenges such as integration of renewable and decentralized energy sources, the requirement for continuous grid estimation and optimization, as well as the use of two-way flows of energy have been brought to the power grid. In order to achieve efficient, reliable, sustainable, as well as secure delivery of electric power more and more information and communication technologies are used for the monitoring and the control of power grids. Consequently, the need for cybersecurity is dramatically increased and has converged into several standards which will be presented here. These standards for the smart grid must be designed to satisfy both performance and reliability requirements. An in depth investigation of the effect of retrospectively embedded security in existing grids on its dynamic behavior is required. Therefore, a retrofitting plan for existing meters is offered, and its performance in a test low voltage microgrid is investigated. As a result of this, integration of security measures into measurement architectures of smart grids at the design phase is strongly recommended.

Keywords : cyber security, performance, protocols, security standards, smart grid

Conference Title : ICSGEE 2018 : International Conference on Smart Grids and Electrical Engineering

Conference Location : Rome, Italy

Conference Dates : May 03-04, 2018