

A Novel Software Model for Enhancement of System Performance and Security through an Optimal Placement of PMU and FACTS

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Abstract : Secure operation of power systems requires monitoring of the system operating conditions. Phasor measurement units (PMU) are the device, which uses synchronized signals from the GPS satellites, and provide the phasors information of voltage and currents at a given substation. The optimal locations for the PMUs must be determined, in order to avoid redundant use of PMUs. The objective of this paper is to make system observable by using minimum number of PMUs & the implementation of stability software at 220kV grid for on-line estimation of the power system transfer capability based on voltage and thermal limitations and for security monitoring. This software utilizes State Estimator (SE) and synchrophasor PMU data sets for determining the power system operational margin under normal and contingency conditions. This software improves security of transmission system by continuously monitoring operational margin expressed in MW or in bus voltage angles, and alarms the operator if the margin violates a pre-defined threshold.

Keywords : state estimator (SE), flexible ac transmission systems (FACTS), optimal location, phasor measurement units (PMU)

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