

State Estimator Performance Enhancement: Methods For Identifying Errors In Modelling And Telemetry

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Abstract : State estimation output of EMS forms the base case for all other advanced applications used in real time by a power system operator. Ensuring tuning of state estimator is a repeated process and cannot be left once a good solution is obtained. This paper attempts to demonstrate methods to improve state estimator solution by identifying incorrect modelling and telemetry inputs to the application. In this work, identification of database topology modelling error by plotting static network using node-to-node connection details is demonstrated with examples. Analytical methods to identify wrong transmission parameters, incorrect limits and mistakes in pseudo load and generator modelling are explained with various cases observed. Further, methods used for active and reactive power tuning using bus summation display, reactive power absorption summary, and transformer tap correction are also described. In a large power system, verifying all network static data and modelling parameter on regular basis is difficult. The proposed tuning methods can be easily used by operators to quickly identify errors to obtain the best possible state estimation performance. This, in turn, can lead to improved decision-support capabilities, ultimately enhancing the safety and reliability of the power grid.

Keywords : active power tuning, database modelling, reactive power, state estimator

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