ABSTRACT

State Estimation is responsible for constructing a complete and reliable database, which will be used by other functions in an Energy Management System. Data redundancy is crucial for the success of state Estimation. With an adequate redundancy, State Estimation can detect, identify and suppress bad data. Besides, the quality/reliability of the estimated quantities is not affected in case of a temporary loss of measurements. Redundancy level is evaluated considering the number, type and location of meters in the network.

Metering systems with a high redundancy level are always desirable. As it is related to the investments on metering and communication equipments, many times redundancy level is reduced due to financial constraints. On the other hand, during power systems operation, topology changes or data acquisition system malfunctions may also reduce the data redundancy for State Estimation. Even critical levels may be reached, where loss of observability is imminent and bad data processing routines do not work properly.

This work describes the development of a computational tool for the design and evaluation of metering systems. The developed tool aims to help the designer on the analyses of different metering plans, taking into account the need to establish adequate trade-offs between the expected performance of the State Estimation function employs and the associated investments costs.