

Department of Electrical and Computer Engineering

Title: «The effect of branch parameter errors on voltage stability enhancement schemes»

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Room KENTP. A019, Old Campus – University of Cyprus

Abstract:

Power system security and control is the backbone of the reliable and uninterrupted operation of power systems. Designing, monitoring and controlling such systems is becoming increasingly more challenging as their size, complexity and interactions are steadily growing. In this context significant results in the fields of security, monitoring, and control of power systems have been derived. Algorithms for identification of errors in line parameters were developed and the effect of measurement errors and of inadequate system modelling on the accuracy of state estimators was investigated. The information gained from synchronized measurement technology was used to monitor the voltage stability mainly in terms of margins to instability. A probabilistic approach was also developed that takes into account the probabilities of various contingencies and their potential impact. These information and approaches were used towards increasing the situational awareness at each stage of the development of a potentially dangerous situation and towards developing algorithms that take into account the sensitivity of the voltage stability margin with respect to control parameters. Controlled islanding methodologies for power systems to ride-through severe faults were also developed.

In the technical presentation, the potential effect of branch parameter errors on voltage stability enhancement is shown. The applied voltage stability enhancement scheme is based on monitoring individual branches and on load shedding, for various thresholds of the applied stability indices. The state estimators used, incorporate synchronized phasor measurements. Errors of varying sign and size in the parameters of the branches are considered. IEEE test systems are used as case studies. Approaches to alleviate the investigated effect of branch parameter errors are discussed.

Biography:

Petros Mavroeidis was born in Athens, Greece in 1980. He holds an MEng and a PhD in Electrical and Computer Engineering awarded from the Aristotle University of Thessaloniki, Greece, in 2002 and 2010 respectively and a BSc in Economic Sciences awarded by the National and Kapodistrian University of Athens, Greece in 2012. His research work includes air and surface discharges with an emphasis on composite insulation. Currently, he focuses on power systems monitoring and stability enhancement.