

This paper presents a decentralized emergency control approach for preventing voltage instability by controlling the reactive power and voltage of the system. The proposed control algorithm is based on a distributed architecture of intelligent agents to identify the affected region and to activate timely countermeasures to achieve a fast and accurate response. By dividing the network into several areas, the voltage instability problem can be localized and countermeasures can be directed to the most affected area by the authorized local agent. This facilitates quick decision making within the system. To achieve effective voltage and reactive power support, a sensitivity based zone formation is proposed. The Nordic32 74-bus test system has been used for testing the proposed multi-agent emergency control (MAEC). The results from the case studies demonstrate the effectiveness of the proposed MAEC approach.

