Abstract

The need to train power system operators to quick restore their electric system is very essential to ensure the continuity of the supply. In this thesis, general restoration guidelines and three different restoration plans using different strategies are developed and organized in a knowledgebase structure to represent the core of a proposed expert system for power system restoration. The proposed expert system is developed using Knowledgebase and Inference Engine mechanism. The expert system is developed to provide sequential steps for system restoration after total or partial blackouts taking into account the correct figures of the generating units merit order, loads priority, voltage control, frequency control, spinning reserve requirements, transmission limitations, and utilization of tie lines with neighboring utilities. The dispatcher can use the expert system via a visual basic interface, which submits a very reliable way to assist the operators by his fastened interactive judgment to restore the power system during actual restoration process or during their training session. As a practical study case, the developed algorithm is applied to restore the Egyptian power system after a total blackout using the three different plans.

Keywords

Power system restoration, Expert system, Power system stability,