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A model of the failure detection based on fuzzy inference system for the control center of a power system.

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Summary: Power network stability requires a timely failure detection and operator reaction. The protection devices and operators have responsibilities for the failure detection in a power system. In other words, alarms being received from the protection devices are displayed to the operator by SCADA to respond to the respective appropriate and timely actions to be done. This article is a part of a risk assessment study on the alarm of power system control centers using the Failure Modes and Effects Analysis (FMEA) that seeks to assess the failure detection in power system. Failure detection evaluation is a subjective case and experts have usually problems with that. In this research, we identify factors that may influence the failure detection, so that experts could assess a failure detection score with an objective criterion. In this study a new definition for the detection scale is presented and relay performance probability is formulated from the viewpoint of the signal detection theory and the Bayes rule. In this paper we treat the effective factors as fuzzy variables and evaluate them using fuzzy inference system. The main advantages of the proposed fuzzy detection score are involving human reliability factors in addition to relay performance and modifying detection score.

Keywords: failure mode and effects analysis; detection score; fuzzy inference system; control center of power system; Bayes rule
http://www.m-hikari.com/ams/ams-2012/ams-33-36-2012/index.html