

Diagnosis System for Power Rectifiers Using the Tree of Faults Method

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Abstract— The static power converters are essential equipment for adapting the type and parameters of the electric energy, placed between sources and loads. During the exploitation of the static power converters, the experience of an expert is absolutely necessary for competitive operation. Minor faults or defects of this equipment can lead to ravaging effects. The most part of the monitoring and diagnosis systems are developed around expert systems. The paper deals with a diagnosis system dedicated to the power rectifiers using the tree of faults method. Based on the effects noted in the behavior of the power rectifiers, an expert system for the diagnosis and the functional testing was developed, by considering the abnormal compartments and the faults which determine these. For building the inference mechanism, the faults tree method applied to the converters was used. The database is comprehensive and takes into account the most frequent faults which occur during the converters operation. The designed expert system was developed by using the CLIPS 6.0 language. The diagnosis system of the bridge rectifier analyses and identifies the causes of the faults which occur during the operation and reduces the displayed results if two sets of values of the sources which determine the same answer differ by a single input. The paper presents the results of the system running and the conclusions resulted after the expert system was executed in order to qualitatively and quantitatively analyze the tree of faults corresponding to the considered equipment.