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SURVEILLANCE APPLICATION USING PATTERN RECOGNITION
SOFTWARE AT THE EBR-II REACTOR FACILITY

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Denny L. Olson
IFR Operation Division
Argonne National Laboratory
P.O. Box 2528
Idaho Falls, Idaho 83403-2528, U.S.A.

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ABSTRACT

The System State Analyzer (SSA) is a software based pattern recognition system. For the past several years this system has been used at Argonne National Laboratory's Experimental Breeder Reactor II (EBR-II) reactor for detection of degradation and other abnormalities in plant systems. Currently there are two versions of the SSA being used at EBR-II. One version of SSA is used for daily surveillance and trending of the reactor delta-T and startups of the reactor. Another version of the SSA is the QSSA which is used to monitor individual systems of the reactor such as the Secondary Sodium System, Secondary Sodium Pumps, and Steam Generator. This system has been able to detect problems such as signals being affected by temperature variations due to a failing temperature controller.

INTRODUCTION

It is imperative that the engineers and operators of a nuclear power plant be aware of the changing plant parameters and individual signal changes or failures in the plant systems. The SSA is being used as an engineering surveillance tool at Argonne National Laboratory's EBR-II reactor to provide this type of information. The SSA has proven to be both useful and flexible in daily surveillance to detect plant system changes and individual signal changes or failures. It is also being used for detection of long term degradation and other abnormalities in plant systems. The SSA is used for surveillance of the Intermediate Heat Exchanger (IHX), reactor delta-T, primary sodium pumps and several other plant systems. This paper describes the SSA and results of current applications at the EBR-II reactor facility.

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