FUZZY RELIABILITY AND FUZZY AVAILABILITY OF A THREE UNIT DEGRADABLE SYSTEMS

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Abstract

Research in traditional reliability theory is based mainly on Probist reliability, which uses binary state assumption and modules governed by classical probability distributions. In the present paper binary assumption has been replaced by a fuzzy state assumption, thereby leading to Profust reliability estimates. It is also recognized that estimates of system parameters, such as failure rates, is vital in reliability estimation. Available methods for such estimation do not cover the underlying uncertainty in the failure data collection involving human judgment, evaluation and decision. In this paper we introduce a new approach based on fuzzy set theory to estimate such system parameters. In the Present paper we have calculated the profust reliability and profust availability of a three unit degradable system. The paper also obtains the classical reliability estimates for the system and examines the effect of fuzziness on system reliability. Mean time to fuzzy failure of the system has also been calculated.

Key Words: Fuzzy reliability, Profust Availability, Fuzzy numbers, Defuzzification.