

A Standby Redundant System with F -policy

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Abstract

This paper studies the availability and reliability issues of the standby redundant repair system consisting of M operating machines and S warm standbys. Each operating machine fails independent of the state of the others and has an exponential time-to-failure distribution. When an operating machine breaks down, it is instantly replaced by a standby machine. In the system, a controlling arrival policy (F -policy) for failed machines is employed to maintain the repair quality of maintenance facility. The operation of control policy is that when the number of failed machines reaches the maintenance facility's capacity, no further arriving failed machines are allowed to enter the maintenance facility until the maintenance facility capacity decreases to a certain threshold value. The server requires an exponential startup time as the system is permitted accumulation of failed machines. For such system, we derive the explicit expressions for the steady-state availability, the steady-state busy period, and the mean time to system failure. We also analyze several cases to study the effect of various parameters on the reliability and mean time to system failure of the system.

Keywords

F - policy; startup time; steady-state availability; steady-state busy period; mean time to system failure

Biography

Jau-Chuan Ke is a Professor of Applied Statistics at the National Taichung Institute of Technology, Taiwan (e-mail: jauchuan@nutc.edu.tw). He received his MS in Applied Mathematics from the National Cheng-Kung University, Taiwan, and his PhD in Applied Mathematics from the National Chung-Hsing University, Taiwan. His research interests include queueing theory, applied probability, statistics and reliability. He has published a number of papers in international journals such as *Journal of Computational and Applied Mathematics*, *Computers & Industrial Engineering*, *International Journal of Computer Mathematics*, *International Journal of Industrial Engineering - Theory, Applications and Practice*, *International Journal of Services Operations and Informatics*, and *Applied Mathematical Modeling*.

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