Optimal Replacement Policy for Cold Standby System

TAN Lin[1,*], YANG Jian[2], CHENG Zhijun[3], and GUO Bo[3]

1 College of Humanities and Social Sciences, National University of Defense Technology, Changsha 410073, China

2 Guilin Airforce Academy, Guilin 541003, China

3 College of Information System and Management, National University of Defense Technology, Changsha 410073, China

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Abstract: Investigators are attracted by the complexity and significance of preventive maintenance problem, and there are hundreds of maintenance models and methods to solve the maintenance problems of companies and army, going with a lot of investigative harvests. However, one-component system or series system is focused by most of the literature. The problem of preventive maintenance (PM) on cold standby repairable system does not attach importance despite the fact that the cold standby repairable system is ubiquitous in engineering systems. In this paper, an optimal replacement model for gamma deteriorating system is studied. This methodology presented in this paper uses a gamma distribution to model the material degradation, and the impact of imperfect maintenance actions on system reliability is investigated. After an imperfect maintenance action, the state of a degrading system is assumed as a random variable and the maintenance time follows a geometric process. A maintenance policy ( ) is applied by which the system will be repaired whenever it experiences the Nth PM, and an optimal policy ( ) could be determined numerically or analytically for minimizing the long-run average cost per unit time. A numerical example about how to confirm the optimal maintenance time by the inspecting information of liquid coupling device is given to demonstrate the use of this policy. This paper presents a condition-based replacement policy for cold standby repairable system under continuous monitoring. Its contribution embody in two aspects, relaxing the restrictions of hypothesis and investigating the condition-based maintenance policy of the cold standby repairable system which is ignored by others.

Key words: cold standby system, maintenance policy, gamma process, geometrical process, imperfect maintenance

*Corresponding author. E-mail: tanlin_2010@126.com
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E-mail: cjme@mail.machineinfo.gov.cn **http:** // www.cjmenet.com.cn