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**Multivariate maintenance policy for unrevealed failures**

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**ABSTRACT**

A large part of reliability theory deals with replacement of single-unit systems, nevertheless, it quite common to find systems consisting of $n$ components which are related. Ebrahimi's work [1997] is concerned with maintenance policies for multi-component systems which are suitable for revealed failures, that is, failures that are detected as soon as they occur. However, technology presents many examples of units whose failures are not revealed unless some type of inspection is performed; Nakagawa and Yasui [1991] and Vaurio [1999] study replacement policies useful in the latter case.

In this work we present a new maintenance policy, useful for series and parallel systems subject to unrevealed failures. This new policy, considered in Berrade [1999], results to be more general than those showed in the previous references. We propose periodic inspections of the units being the cost per unit of time, for an infinite time span, the objective function considered. We attempt to find optimum policies giving sufficient conditions which guarantee that such policy exists. The theoretical results are illustrated by means of several examples where the times to failure are assumed to have some multivariate exponential distributions.

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