Preliminary Analysis of Queues with an Imperfectly Repaired Server

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Abstract

We consider a queueing system where the server is subject to failures and can be repaired within a random period of time. After an "imperfect" repair, the server (machine) will be in a state between "as good as new" and "as bad as old". The server state will determine either the failure rate or the service rate or both. A Quasi Birth Death process is developed for modeling such a system. We investigate the effect of maintenance policy on the queue or overall performance. Under a cost structure, we illustrate the search for the optimal maintenance policy to minimize the costs. Queueing effects on the average cost of operating such a system are examined with numerical analysis.