Abstract

In industrial systems some components are kept in spare to cope up with the failures of operating components. The failure of these spares too, significantly affects the functioning and outputs of the system. The current paper investigates a semi-Markov model for a redundant system consisting of two identical units and a repair facility. The system starts operating with one unit in operation and remaining in redundancy mode. The failure rate of unit in redundancy is zero, initially. After crossing a pre specified time the redundant unit is expected to fail and thereafter it goes under inspection to check feasibility of maintenance or replacement so that necessary remedial action can be taken. Under this framework the expressions for various measures of system performance are derived exploring the regenerative point technique of renewal theory. A numerical example, for a particular case, illustrates the practical importance of the study graphically.


**Index Terms**

Computer Science  
Information Sciences

**Keywords**

Stochastic system, standby failure, maintenance, regenerative point, performance measures.