

## Stochastic Behaviour of $k$ -out-of- $n$ System with Different Types of Failures and Repair: $T$ -Policy

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### Abstract

Stochastic behaviour of  $k$ -out-of- $n$  system with common-cause failures and human errors is analysed under repair  $T$ -policy. The lifetime of each component is exponentially distributed with parameter  $\lambda$ , whereas it is  $\beta(\beta')$  for common-cause failure and  $\gamma(\gamma')$  for human errors in model I (model II). The repairman is called to the system after the elapse of  $T$  units of time, since his departure after completion of repair of all failed units in the previous cycle or until accumulation of  $(n - k)$  failed units, whichever occurs first. The repair time is also exponentially distributed with rate  $\mu$  for all types of failures. Further  $T$  is exponentially distributed with parameter  $\alpha$ . System state probabilities in finite time and steady-state probabilities are derived for cold and warm systems. Several statistical characteristics are obtained and the total expected profit per unit time for both cold and warm systems are also obtained.

*Keywords:* Common-Cause Failures, Human Errors,  $k$ -out-of- $n$  System,  $T$ -Policy.