

A TWO DISSIMILAR UNIT STANDBY SYSTEM WITH THREE MODES OF PRIORITY UNIT AND CORRELATED FAILURE AND REPAIR TIMES

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Abstract—*The paper deals with the analysis of a system model consisting of two non-identical units. One unit is named as priority (p) unit and other as non-priority or ordinary (o) unit. So, initially priority unit is operative and the ordinary unit is kept into cold standby. Priority unit has three modes-Normal (N), Partial failure (P) and total failure (F) whereas ordinary unit has two modes-Normal (N) and total failure (F). The priority unit can't enter into F-mode without passing through the P-mode. The operation and repair of priority unit in P-mode are possible simultaneously. A single repairman is always available with the system to repair priority unit failed partially or totally as well as the repair of totally failed ordinary unit. The preference in repair is being given to priority unit in both its partial and total failure mode over the ordinary unit. The joint distribution of failure and repair times of each unit is taken as bivariate exponential. Various economic related measures of system effectiveness are obtained by using regenerative point technique-*

- i. Transient-state and steady-state transition probabilities.
- ii. Mean sojourn time in various regenerative states.
- iii. Reliability and mean time to system failure (MTSF).
- iv. Point-wise and steady-state availabilities of the system as well as expected up time of the system during time interval $(0, t)$.
- v. The expected busy period of repairman in time interval $(0, t)$.
- vi. Net expected profit earned by the system in time interval $(0, t)$ and in steady-state.