

# System Availability Model Subject to Multi-State Failure

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## Abstract

The performance capability of manufacturing system is determined generally based on the system RAM (reliability, availability, and maintainability) and its system cost. For the system performance improvement, we have to consider a system availability model subject to multi-state failures where a component or subsystem may fail completely or may continue to operate at a level below the original design specifications. This research is expanded from conventional two-state RAM model in to three-state RAM model. This research includes quantitative model of system availability, system costing and its software model. First, we developed three-state availability model, and related life cycle costing model. Finally, we have developed a software program to calculate all algorithms of proposed model and the model is applied to an example of three-state availability. Through this analysis, we are able to select and design an optimal system configuration for manufacturing system.