

## **Inventory System Analysis by Markov Renewal Processes**

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### **Abstract**

This paper presents an application of Markov Renewal process for the study of a continuous review (s,S) inventory system in which depletion of stock takes place due to random demand as well as random failure of items. The replenishment of stock is assumed to instantaneous. Inventory level constitute a Markov chain with state space  $(s+1, s+2, \dots, s+M)$ , where  $s \leq S-1$ . The transient solution of the model, Average annual cost, Probability generating function and Joint distribution function of the number of replenishment have been obtained.

*Keywords:* Markov Renewal process, Markov Chain, Inventory System.