Optimal Replacement Period for a One-Unit System with Double Repair Cost Limits

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Abstract : This paper presents a periodical replacement model for a system, considering the concept of single and cumulative repair cost limits simultaneously. The failures are divided into two types. Minor failure can be corrected by minimal repair and serious failure makes the system breakdown completely. When a minor failure occurs, if the repair cost is less than a single repair cost limit L1 and the accumulated repair cost is less than a cumulative repair cost limit L2, then minimal repair is executed, otherwise, the system is preventively replaced. The system is also replaced at time T or at serious failure. The optimal period T minimizing the long-run expected cost per unit time is verified to be finite and unique under some specific conditions.
Keywords : repair-cost limit, cumulative repair-cost limit, minimal repair, periodical replacement policy