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Admission Control Policy for Remanufacturing Activities with Quality Variation of Returns

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Abstract : This paper develops a model for the optimal disposition decision for product returns in a remanufacturing system with limited recoverable inventory capacity. In this model, a constant demand is satisfied by remanufacturing returned products which are up to the minimum required quality grade. The quality grade of returned products is uncertain and remanufacturing cost increases as the quality level decreases, and remanufacturer wishes to determine which returned product to accept to be remanufactured for reselling, and any unaccepted returns may be salvaged at a value that increases with their quality level. Accepted returns can be stocked for remanufacturing upon demand requests, but incur a holding cost. A Markov decision problem is formulated in order to evaluate various performance measures for this system and obtain the optimal remanufacturing policy. A detailed numerical study reveals that our approach to the disposition problem outperforms the current industrial practice ignoring quality grade of returned products. In addition, we identify conditions under which this improvement is the highest.

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