Replenishment lot sizing with failure in rework and an enhanced multi-shipment policy

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This study determines the optimal replenishment lot size for a manufacturing system with failure in rework and an enhanced multi-shipment policy. An economic lot size problem incorporated a multi-delivery policy and quality assurance was examined in a recent study\textsuperscript{1}, with the primary intention of reducing a producer’s inventory holding cost, this paper formulated an enhanced multi-shipment distribution policy to improve the solution for such a specific problem. With a help of mathematical modelling and optimization technique, the optimal replenishment lot size for the proposed system is obtained. As a result, not only the holding cost but the entire expected system cost per unit time is minimized. A numerical example was provided to show practical applicability of the obtained results and to demonstrate significant savings in a producer’s stock holding cost.

\textbf{Keywords:} Replenishment lot size, Optimization, Manufacturing system, Multiple shipments, Cost reduction, Imperfect rework

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