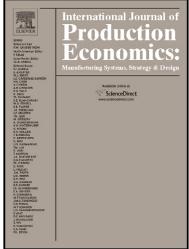
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R. Hlioui, A. Gharbi, A. Hajji



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### eplenishment, production and quality control strategies in three-stage supply chain

#### R. Hlioui<sup>a</sup>, A. Gharbi<sup>a\*</sup>, A. Hajji<sup>b</sup>

<sup>a</sup> Department of Automated Production Engineering, Production System and Control Laboratory, École de technologie supérieure. Université du Quebec, Montreal, QC, Canada

<sup>b</sup> Department of Operations and Decision Systems & CIRRELT, Laval University, Québec, QC, Canada SCI

#### Abstract

In this paper, we propose to jointly integrate and coordinate production, replenishment and quality inspection decisions in a three-stage supply chain control problem. The transformation stage produces one final product type and responds to a stable market demand. After a random lead time, the supplier delivers raw materials in batches which may each contain a certain proportion of defective items. When a lot of raw materials is received, a lot-by-lot acceptance sampling plan is applied, and then a decision is taken with regards to a 100% screening or discarding of the sampled lot. In this article, we focus on the existing interaction between the applicable quality control decisions and the replenishment and production control decisions. The objective is to determine a control policy for production, replenishment and quality activities which minimizes the total cost, including purchasing costs, production and quality inspection costs, as well as the inventory/backlog costs. A simulation model and a response surface methodology are used to find the optimal parameters of the proposed policy. The obtained results show that the integration of 100% screening or discarding decisions in a new "hybrid" one is more beneficial, and guarantees a better coordination at a lower cost.

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