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Conservation of filtering in manufacturing systems with unreliable machines and finished goods buffers. (English) | Zbl 1200.91160 |

Summary: This paper addresses the issue of reliable satisfaction of customer demand by unreliable production systems. In the framework of a simple production-storage-customer model, we show that this can be accomplished by using an appropriate level of filtering of production randomness. The filtering is ensured by finished goods buffers (filtering in space) and shipping periods (filtering in time). The following question is considered: how are filtering in space and filtering in time interrelated? As an answer, we show that there exists a conservation law: in lean manufacturing systems, the amount of filtering in space multiplied by the amount of filteringin time (both measured in appropriate dimensionless units) ispractically constant. Along with providing an insight into the nature of manufacturing systems, this law offers a tool for selecting the smallest, that is, lean, finished goods buffering, which is necessary and sufficient to ensure the desired level ofcustomer demand satisfaction.

MSC:

91B38	Production theory, theory of the firm
91B70	Stochastic models in economics

Cited in **3** Documents

Full Text: DOI

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