

Production/Maintenance Optimization problem with random repair time

Zied Hajej, Sofiene Dellagi and Nidhal Rezg

LGIPM laboratory
University of Lorraine
Metz, 57045, France

zied.hajej@univ-lorraine.fr, sofiene.dellagi@univ-lorraine.fr, nidhal.rezg@univ-lorraine.fr

Abstract

This study deals with an industrial problem of a manufacturing system satisfying a random demand, during a finite horizon, under service level and random repair time of machine. In most repair models for manufacturing system, the repair time of machine is assumed to be negligible, and so the length of repair time has not been an influence in developing the production and maintenance models. However, in industrial problem, it is more realistic to take into account the influence of a certain amount of repair time. The key of this study is to consider the influence of production rate on the failure rate of machine, consequently on the average number of failure as well as the influence of repair time on the production plan and customer satisfaction. We prove with a constrained stochastic production problem under hypotheses of service level, an optimal production and maintenance plans, which minimizes the total production, inventory and maintenance cost.

Keywords

Production plan, Maintenance plan, random demand, service level, random repair time, preventive maintenance, optimization.

Biography

Zied Hajej is a associate professor at the University of Lorraine, Metz platform since September 2012. it operates research in the laboratory LGIPM Metz. After obtaining his doctorate at the University of Paul Verlaine - Metz in 2010, he was employed at the University of Metz as contract research engineer until August 2012. His main areas of research on the optimization of maintenance policies coupled to production and the development of methods and support the design and control tools in the production systems of goods and services. He is the author of numerous articles in international community of industrial engineering. Her teaching areas include modeling and organization of manufacturing and logistics systems, the practice of simulation, automation, and quality system production.

Sofiene Dellagi is a associate professor, empowered to direct research in industrial engineering at the University of Lorraine, Metz platform since September 2008. After obtaining his doctorate at the University of Paul Verlaine - Metz in 2006, he was employed at the University of Metz as contract temporary teaching and research during 2006-2007. Since February 2008, Dr. Dellagi Sofiene is a member of the team Reliability & Maintenance Laboratory of Industrial Engineering and Production of Metz (LGIPM). His main areas of research on the optimization of maintenance policies coupled to production and the development of methods and support the design and control tools in the production systems of goods and services. He is the author of numerous articles in international community of industrial engineering.

Nidhal Rezg is a professor at the University of Lorraine; he is a Doctor of Industrial Automatic from the National Institute of Applied Sciences (INSA) in Lyon in 1996. Accreditation to supervise research at the University of Metz in 2003. he was Professor at the Faculty of Engineering of the University of Moncton, New Brunswick Canada from 1997 to 1999 and Associate professor at the University of Metz until 2004, and currently holds the position of Professor of University. He is director of LGIPM laboratory since October 2006 and scientific responsible of the

INRIA CusTom team from 2007 to 2011. His research interest is the optimization of maintenance policies coupled to production, the optimal control SED. He is the author of sixty papers in international journals, directors of 12 theses and 4 Accreditation to supervise research. Keywords researches are modeling, simulation and optimization of stochastic processes, reliability and maintenance and Petri nets.