

Imperfect Production Systems With Imperfect Preventive Maintenance, Inflation, And Time Value Of Money

Darwish, MA

**WORLD SCIENTIFIC PUBL CO PTE LTD, ASIA-PACIFIC JOURNAL OF
OPERATIONAL RESEARCH; pp: 89-105; Vol: 23**

King Fahd University of Petroleum & Minerals

<http://www.kfupm.edu.sa>

Summary

A model that integrates the issues of production, quality, maintenance, inspection, inflation, and time value of money is proposed in this paper. It is assumed that the production system starts in the in-control state producing items of high or perfect quality. However, the process may deteriorate with time and shifts at a random point in time to an out-of-control state and begins to produce non-conforming items. The elapsed time for the process to shift to the out-of-control state is assumed to follow a general distribution. Imperfect preventive maintenance, restoration, and inspection errors are taken into account. Also, inflation, time value of money, and shortage are considered in the proposed model. Numerical examples are presented to illustrate important aspects of the integrated model.

References:

1. ALSULTAN KS, 1997, EUR J OPER RES, V103, P198
2. BARLOW RE, 1960, OPER RES, V8, P90
3. BAZARAA MS, 1993, NONLINEAR PROGRAMMIN
4. BENDAYA M, 2001, INTEGRATED MODELING
5. BENDAYA M, 2002, INT J PROD ECON, V76, P257
6. BIERMAN H, 1977, DECISION SCI, V8, P151
7. BOSE S, 1995, J OPER RES SOC, V46, P771
8. BUZACOTT JA, 1975, OPNL RES Q, V26, P553
9. CHANDRA MJ, 1985, INT J PROD RES, V23, P723
10. DARWISH M, 2000, MODIFIED TABU SEARCH
11. DATTA TK, 1991, EUR J OPER RES, V52, P326

12. ELSAYED EA, 1983, INT J PROD RES, V21, P449
13. HARIGA MA, 1996, EUR J OPER RES, V89, P313
14. HOLLIER RH, 1983, INT J PROD RES, V21, P813
15. HOOKE R, 1961, J ASSOC COMPUT MACH, V8, P212
16. HOROWITZ I, 2000, INT J PROD ECON, V65, P217
17. HUANG, 1996, INT J QUALITY RELIAB, V8, P212
18. LEE HL, 1987, MANAGE SCI, V33, P1125
19. LEE HL, 1989, IIE TRANS, V21, P368
20. LIN TM, 1991, J CHINESE I IND ENG, V8, P73
21. MIRSA RB, 1975, LOGISTICS SPECTRUM, V9, P260
22. MIRSA RB, 1979, NAV RES LOG, V26, P161
23. NAKAGAWA T, 1980, RAIRO-RECH OPER, V14, P249
24. PHAM H, 1996, EUR J OPER RES, V94, P425
25. PORTEUS EL, 1986, OPER RES, V34, P137
26. RAHIM MA, 1993, NAV RES LOG, V40, P787
27. RAHIM MA, 1994, IIE TRANS, V26, P2
28. RAY J, 1997, INT J PROD ECON, V53, P171
29. ROSENBLATT MJ, 1986, IIE TRANS, V18, P48
30. SARKER BR, 1994, INT J PROD ECON, V34, P65

For pre-prints please write to: mdarwish@ccse.kfupm.edu.sa