

A General Inspection Plan For Critical Multicharacteristic Components

Duffuaa, SO; AlNajjar, HJ

TAYLOR FRANCIS LTD, INTERNATIONAL JOURNAL OF PRODUCTION

RESEARCH; pp: 2723-2736; Vol: 35

King Fahd University of Petroleum & Minerals

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

Summary

In this paper, a general inspection plan for critical multicharacteristic components is presented. In this plan the assumption in the literature that characteristics are inspected equal number of times for such components is relaxed and allowed for different number of inspections for different characteristics depending on characteristic's defective rates and inspection cost. A mathematical model that depicts and represents the plan has been developed. A decent type algorithm is proposed to determine the optimal number of repeat inspections and sequence characteristics for inspection that minimizes the expected total cost. The expected total cost consists of the cost of false acceptance (cost of type II error), cost of false rejection (cost of type I error), and the cost of inspection. Empirical comparisons with the model in the literature on randomly generated problems has been conducted. The results have shown that the proposed plan performs better in terms of the expected total cost on 87 percent of the generated problems for the assumed specific parameters. The reduction in the expected total cost is up to 23.5%.

References:

1. AYOUB MM, 1975, HUM FACT SOC M BALT
2. BENNETT GK, 1974, NAV RES LOG, V21, P431
3. CASEY R, 1973, BOREAL LOWER CRETACE, V5, P193
4. COLLINS RD, 1972, P 23 ANN C CONV AIIE
5. DUFFUAA SO, 1987, P 9 INT C PROD RES E, P738
6. DUFFUAA SO, 1989, APPL MATH MODEL, V13, P408
7. DUFFUAA SO, 1990, J OPTIMIZ THEORY APP, V67, P79
8. DUFFUAA SO, 1994, INT J PROD RES, V32, P1897

© Copyright: King Fahd University of Petroleum & Minerals;
<http://www.kfupm.edu.sa>

9. DUFFUAA SO, 1994, J OPERATIONAL RES SO, V46, P930
10. JAIN JK, 1977, THESIS U WINDSOR CAN
11. LEE HL, 1988, IIE TRANS, V20, P392
12. RAOUF A, 1983, IIE TRANS, V15, P187
13. RAOUF A, 1983, P 1 SAUD ENG C JEDD

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