



Management Science

Publication details, including instructions for authors and subscription information:
<http://pubsonline.informs.org>

Note—Comments on “Shortest Route Models for Allocation of Inspection Effort on a Production Line” by Leon S. White

Edward P. C. Kao,

To cite this article:

Edward P. C. Kao, (1976) Note—Comments on “Shortest Route Models for Allocation of Inspection Effort on a Production Line” by Leon S. White. *Management Science* 22(10):1169–1169. <https://doi.org/10.1287/mnsc.22.10.1169>

Full terms and conditions of use: <https://pubsonline.informs.org/Publications/Librarians-Portal/PubsOnLine-Terms-and-Conditions>

This article may be used only for the purposes of research, teaching, and/or private study. Commercial use or systematic downloading (by robots or other automatic processes) is prohibited without explicit Publisher approval, unless otherwise noted. For more information, contact permissions@informs.org.

The Publisher does not warrant or guarantee the article's accuracy, completeness, merchantability, fitness for a particular purpose, or non-infringement. Descriptions of, or references to, products or publications, or inclusion of an advertisement in this article, neither constitutes nor implies a guarantee, endorsement, or support of claims made of that product, publication, or service.

© 1976 INFORMS

Please scroll down for article—it is on subsequent pages



With 12,500 members from nearly 90 countries, INFORMS is the largest international association of operations research (O.R.) and analytics professionals and students. INFORMS provides unique networking and learning opportunities for individual professionals, and organizations of all types and sizes, to better understand and use O.R. and analytics tools and methods to transform strategic visions and achieve better outcomes. For more information on INFORMS, its publications, membership, or meetings visit <http://www.informs.org>

Notes*

IV

COMMENTS ON "SHORTEST ROUTE MODELS FOR ALLOCATION OF INSPECTION EFFORT ON A PRODUCTION LINE" BY LEON S. WHITE*†

EDWARD P. C. KAO

University of Wisconsin-Milwaukee

This note points out an omission in the above paper. It also suggests a modification in the problem formulation.

In [2], White has proposed a shortest route formulation for the production line inspection problem considered by Pruzan and Jackson [1]. In the paper [2, pp. 253–254], the expected cost associated with arc $(m, L + 1)$, $m = 0, 1, \dots, L$, did not include the cost of processing an item after it has incurred a nonrepairable defect subsequent to stage m . To rectify the situation, we define $cp_{L+1} = 0$ and $cd_{m, L+1} = 0$, and use the equations yielding $s(m, n)$ and $c(m, n)$ also for the case in which $n = L + 1$. With the above change, portion of the $c(m, n)$ given on p. 257 of [2] should read $c(0, 6) = 7720$, $c(1, 6) = 5060$, $c(2, 6) = 3560$, and $c(3, 6) = 3059$. The optimal inspection policy derived for the example remains the same.

In computing the expected cost of wasted processing effort, White, as well as Pruzan and Jackson, included the cost of processing an item *after* it has incurred a nonrepairable defect up to the stage at which it is removed by the inspector. We will now argue that the handling of this cost element is inadequate. Suppose that inspection at stage m is followed by inspection at stage n and no inspection is performed between m and n . Then it is more reasonable to assume that processing costs from stage $m + 2$ to stage n for *all* nonrepairable units made between stage m and stage $n - 1$ will be wasted. Therefore the equation for the expected cost of scrapping items shown on p. 253 of [2] should read:

$$s(m, n) = [B(m) - B(n - 1)] \sum_{j=m+2}^n cp_j + cd_{mn} [B(m) - B(n)].$$

Finally we note in passing that the formulation of Pruzan and Jackson can not accommodate the prescribed modification.

References

1. PRUZAN, P. M. AND JACKSON, J. T. R., "A Dynamic Programming Application in Production Line Inspection," *Technometrics*, 9, 1967, pp. 73–81.
2. WHITE, L. S., "Shortest Route Models for the Allocation of Inspection Effort on a Production Line," *Management Science*, 15, 1969, pp. 249–259.

* All notes are refereed.

† Processed by Professor Morton Klein, Departmental Editor for Network Flows and Location Analysis; received February 1975.