IN-HOUSE VALUE ENGINEERING ON MATTRESS, BED, INNERSPRING

James E. Mello, et al

Army Natick Laboratories
Natick, Massachusetts

May 1974

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER 75-21	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER AD 786 517
4. TITLE *(and Subtitle)* IN-HOUSE VALUE ENGINEERING ON INNERSPRING MATTRESS		5. TYPE OF REPORT & PERIOD COVERED Technical Report 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) James E. Mello and Edward P. Sylvia		8. CONTRACT OR GRANT NUMBER(s) CE&MEL 126
9. PERFORMING ORGANIZATION NAME AND ADDRESS Clothing Equipment & Materials Engineering Laboratory US Army Natick Laboratories Natick, MA 01760		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 40342003 Job #2
11. CONTROLLING OFFICE NAME AND ADDRESS Clothing Equipment & Materials Engineering Laboratory US Army Natick Laboratories, Natick, MA 01760		12. REPORT DATE May 1974 13. NUMBER OF PAGES 6
14. MONITORING AGENCY NAME & ADDRESS *(if different from Controlling Office)*		15. SECURITY CLASS. *(of this report)* Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT *(of this Report)*

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Mattress	Mattresses (innerspring)	Maintainability
Value Engineering	Performance	
Straps	Quality	
Handles	Reliability	

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

The application of value engineering (VE) techniques to the innerspring mattress produced several areas in which material, labor and money savings could be accomplished without affecting the function of the item. This report deals with the VE proposal to eliminate handles (lifting straps) from the type II, size 4 innerspring mattress of Federal Specification V-M-96 Mattresses, Bed, Innerspring. It is hoped that handles can be deleted from all sizes of mattresses covered by V-M-96, as a result of this report.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE 1 UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

PREFACE

In response to the Department of the Army's emphasis on cost reduction, the Clothing and Personal Life Support Equipment Laboratory has increasingly turned to the use of Value Engineering as a prime method in meeting cost reduction goals. Since Value Engineering places emphasis on achieving essential requirements at minimum cost, it contributes to the efficient use of the nation's resources. It is just as wasteful to pay for quality features that are not required to achieve essential requirements as it is to receive defective items that cannot meet essential operational requirements. Value Engineering can help in achieving maximum performance for a limited amount of available resources.

IN-HOUSE VALUE ENGINEERING ON MATTRESS, BED, INNERSPRING

I. INTRODUCTION

Value Engineering (VE) is defined as an organized effort directed at: (1) identifying the functions of an item, a system, equipment, facilities, procedures and supplies; (2) establishing a value for that function; and (3) achieving that function at the lowest overall cost, consistent with the required performance, reliability, quality and maintainability characteristics. Today, Value Engineering is recognized as an invaluable technique for meeting one of the most compelling contemporary military problems - increasingly higher costs. This report covers some experiences that demonstrate the effectiveness of Value Engineering in reducing cost, without compromising the quality and reliability of defense items.

II. OBJECTIVE

Items produced in high volume and which utilize various components offer good potential for substantial savings resulting from a moderate amount of VE effort. Items of Federal Specification V-M-96 Mattresses, Bed, Innerspring fall within this category.

III. VALUE ENGINEERING STUDY OF MATTRESSES

Our review indicated that there were several areas which contain VE potential. It was decided that we should expend our efforts on one specific area.

VE Proposal: Elimination of handles on the type II, size 4 innerspring mattress (V-M-96).

IV. BACKGROUND

The type II, size 4 mattress was selected as it is the most popular size and is the standard for use by all the Services in barracks and dormitories. Innerspring mattresses have traditionally been manufactured with handles. The primary purpose of the handles is to facilitate the lifting and turning of mattresses (required to extend a mattress's life expectancy). They are not intended for use in transporting mattresses from one area to another. Several handle failures were reported, and in one instance an activity requested that the cloth vertical handle be removed prior to use. The findings of our evaluation revealed that the handles were failing due to improper use, i.e., mattresses were being routinely moved from one area to another, with the handles as the only means of support (see attached photo for positions of handles).

This misuse of their intended purpose resulted in the handles being torn and ripped from the mattresses (see attached photo). The resultant condition renders the mattress as unusable or severely shortens the mattress's life expectancy. Action was then taken to eliminate the vertical handles from the specification and to leave only horizontal cord handles in the document. It was also decided to investigate whether it would be feasible to delete all handles from the innerspring mattress specification. This action prompted the VE Proposal.

V. COORDINATION

This VE proposal was coordinated with the mattress industry. The industry concurred with our proposal. Recent industry trends indicate that commercial mattresses of this size have eliminated handles. Some companies have already eliminated handles of this size of mattresses without any consumer complaints. The industry agreed that the elimination of handles would not cause any hardship at all and that this size mattress can very easily be turned without handles. The National Industries for the Blind (the primary manufacturers of Government mattresses) tell their people not to use the handles when handling mattresses. In addition, in use each mattress is covered with a mattress cover to protect it from soiling. This cover which is an envelope style completely covers the mattress and reduces the effective use of handles in lifting and turning the mattresses. It was further considered that both our servicemen and women would be capable of lifting and turning a mattress (bunk size) without the use of handles and without the need to remove the mattress cover to do so. Mattresses covered by specification V-M-81 Mattresses, Bed, Felted Cotton and ZZ-M-91 Mattress, Bed, Foam are constructed without handles. In view of the foregoing, it was decided that a test would not be needed to evaluate this VE proposal.

Subsequently the VE proposal was coordinated with all Services. All Services concurred with the proposal with the exception of the Navy. The Navy desires to retain horizontal cord handles on their mattresses. Accordingly, specification V-M-96 has been revised to show Class 1 - Without handles, Class 2 - With handles.

VI. RESULTS OF THE VALUE ENGINEERING STUDY

The monetary savings to the Government resulting from the approval of this value engineering proposal by all Services except the Navy is as follows:

Procurement during FY 1974 of the type II, size 4 mattresses was 109,100, out of which the Navy drew only about 5.3% or approximately 5,800 mattresses. The estimated savings per mattress is $0.4235. This figure reflects a savings in material, labor, and overhead.

Cost Analysis:

Total procurement FY74	109,100	mattresses
Less: Navy use of 5.3%	-5,800	mattresses
Balance to other Services	103,300	mattresses

103,300 mattresses X $0.4235/mattresses=approximate savings of $43,747.55

NOTE: The savings were determined from information received from various manufacturers who aided in our evaluation of the proposal. Due to fluctuations in the

textile market and through competition in the industry, the savings may vary from one procurement to another. However, it can be stated with full confidence that if this value engineering change had not been adopted, then future contract prices for these mattresses would be unnecessarily higher than required for the mattresses.

VII. VALUE ENGINEERING SPIN-OFF

It is hopeful that within the near future the fruits of this value engineering proposal can be made applicable to all mattress sizes and types cited in Federal Specification V-M-96. A project will be initiated shortly to determine the feasibility of eliminating handles from all sizes and types of mattresses where they are not essential for purposes other than routine turning.

VIII. CONCLUSION

Through the use of value engineering, the unnecessary costs associated with the attachment of lifting straps on the mattresses have been eliminated. This VE has not lowered the overall quality of the end item by eliminating the handles as it may appear. This is a common fallacy shared by many who are unfamiliar with the virtues of value engineering. Actually, in this case, as in every other case of careful, well organized Value Engineering Study, the overall performance and quality of the end item have been enhanced. By eliminating the handles which cause premature mattress failure (tears and rips in ticking), the overall service life expectancy of these mattresses has been extended. This Value Engineering Study has resulted in an item which is less expensive for the Government to procure initially, yet one which will give greater value for the dollar spent through longer length of service.

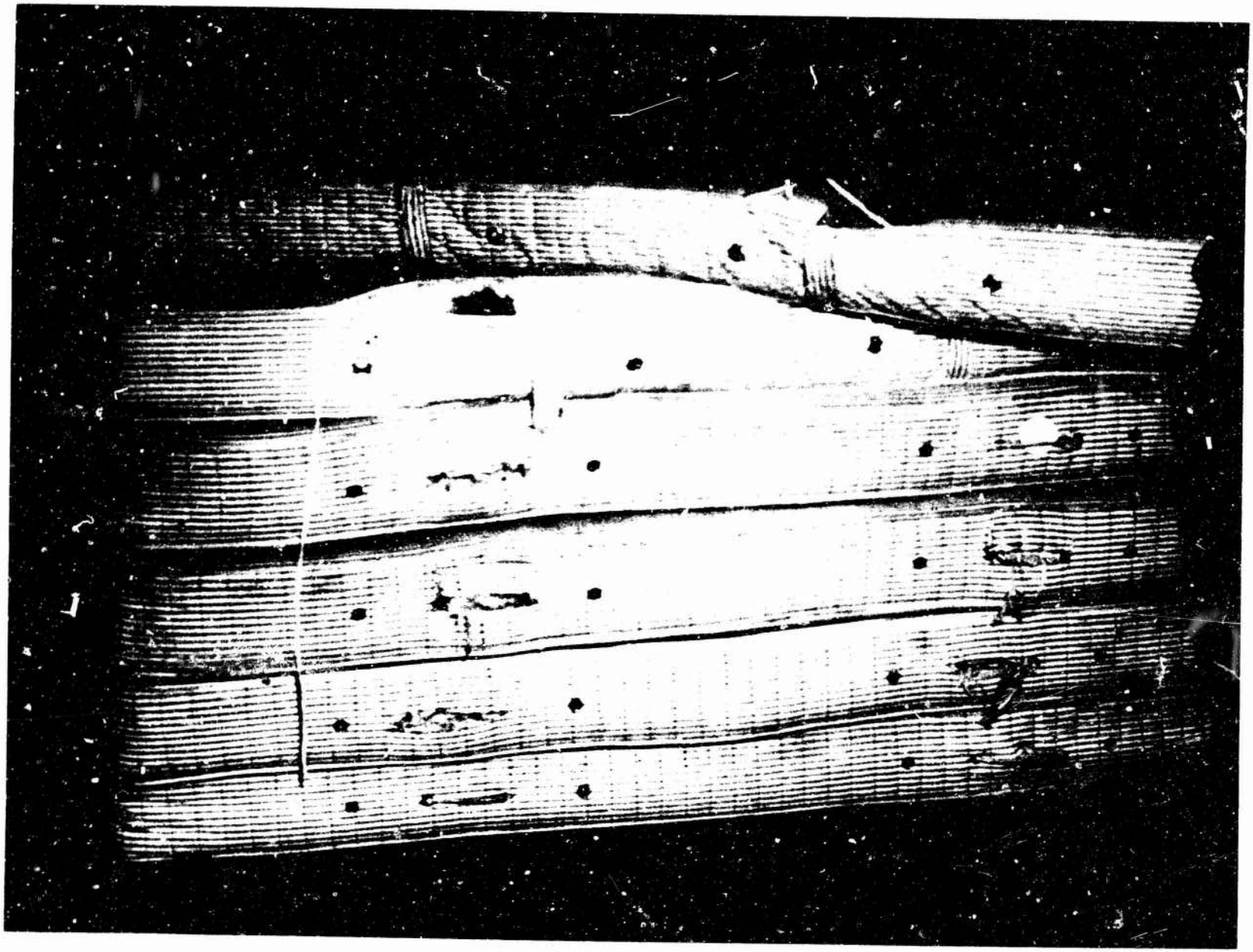

Figure 1. Damaged mattresses.