AD-A045 515 DEFENSE LOGISTICS ANALYSIS OFFICE ALEXANDRIA VA F/G 15/5
MATERIEL RETURNS CRITERIA.(U)
AUG 77

UNCLASSIFIED NL

| OF |
AD
A045515



END
DATE
FILMED
11-77
DDC

AD A045515

DDC FILE COPY

FTEGG027125001873808 PG 00252FB205962650486A A6C

FIRGG027125001873808 PG 00252FB205962650486A A

(1)
B.S.

(6)

MATERIEL RETURNS CRITERIA

(12) 87 p.

DDC
RECEIVED
OCT 20 1977
A

DEFENSE LOGISTICS AGENCY

DEFENSE LOGISTICS ANALYSIS OFFICE

(11) August 1977

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

410 426

DEFENSE LOGISTICS AGENCY
HEADQUARTERS
CAMERON STATION
ALEXANDRIA, VIRGINIA 22314

DLAO

15 August 1977

FOREWORD

In a memorandum dated 29 November 1976, the Deputy Assistant Secretary of Defense (Supply, Maintenance and Services) requested the Defense Logistics Analysis Office to conduct a review and analysis of policy, criteria, and processes for excess materiel reporting and returns determination. The DASD(SM&S) memorandum and its attached study plan established the following study objectives:

** Ascertain how DoD and GSA materiel returns are processed;

** Determine the cost of effecting materiel returns;

** Evaluate the cost versus the value of returning materiel to store; and

** Recommend criteria for making credit return decisions and submit the criteria to the DoD and GSA for consideration.

This Report contains the results of analyses pertaining to the excess materiel returns processes for materiel managed by DoD Components and the General Services Administration. The data used for the analyses was obtained from published reports, DoD Component and GSA briefings, data submissions and on-site research. Conclusions and recommendations based on these analyses are included in the Report.

Eugene B. Sterling

EUGENE B. STERLING
Major General, USAF
Assistant Director
Plans, Programs and Systems

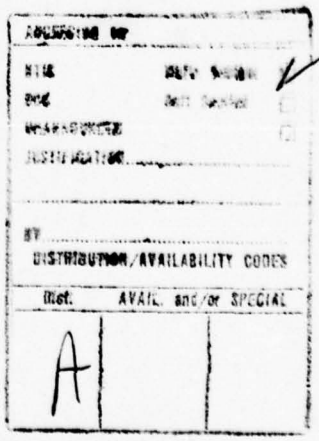


TABLE OF CONTENTS

MATERIEL RETURNS CRITERIA

Chapter		Page
	FOREWORD	i
	TABLE OF CONTENTS	iii
	LIST OF TABLES AND FIGURES	vii
I	INTRODUCTION	1
	A. Background	1
	B. Study Objectives	2
	C. Study Scope	2
	D. Study Team Composition	2
	E. Study Approach	3
	F. Report Organization	3
II	POLICIES AND PROCEDURES	5
	A. Introduction	5
	B. Policies	5
	1. DoD	5
	2. GSA	6
	C. Procedures	6
	1. Current Basic Processes	7
	2. Unique Practices	7
	3. Current and Projected Procedural Developments	9
	D. Key Observations and Conclusions	9

PRECEDING PAGE NOT FILMED
BLANK

Chapter		Page
III	PROGRAM PERSPECTIVE	11
	A. Introduction	11
	B. Materiel Return Document Volume	11
	C. DoD Components and GSA	12
	D. GSA Credit Returns Financial Statement	14
	E. Inventory Manager Responses to Reports of Excess	15
	1. General	15
	2. Type of Response	15
	F. Potential Impact of Modified Materiel Returns	18
	1. GSA	18
	2. DoD	22
	G. Key Observations and Conclusions	24
IV	CRITERIA FOR REPORTING ACTIVITY EXCESS, MAKING MATERIEL RETURN DECISIONS, AND GRANTING CREDIT	25
	A. Introduction	25
	1. Range of Options	25
	2. Assumptions	25
	3. Basic Approach	25
	4. Data	26
	B. Value of Materiel Returns	27
	1. Procurement Costs Avoided	27
	2. Inventory Holding Cost	29
	3. Present Value Concept	29
	4. Present Value of Return with a Current Requirement	30
	5. Present Value of Materiel Returned to Satisfy a Future Requirement	31

Chapter		Page
C.	Cost to Return	32
	1. Document Processing Costs	32
	2. Transportation Costs	33
	3. Wholesale Depot Costs	34
	4. Recap of Cost to Return	34
D.	Net Cost of Disposal	34
	1. Introduction	34
	2. Excess Line Items to Disposal Line Items	35
	3. Property Disposal System Data	35
	4. Impact of Net Disposal Cost	36
E.	Breakeven Point	37
	1. Basic Approach	37
	2. Alternative Approach	38
F.	Sensitivity Analysis	38
	1. Introduction	38
	2. Discussion	38
	3. Summary	40
G.	Practical Return and Reporting Criteria	40
	1. General	40
	2. Return Limits	41
	3. Reporting Limits	41
	4. Impact of Revised Criteria	42
H.	Credit Returns Policy and Practices	42
	1. Background	42
	2. Application of Credit Based on Value of Materiel	43
	3. Methods for Applying Credit	44
	4. Practical Credit Return Criteria	46
	5. Impact of Modified Criteria	46
I.	Key Observations and Conclusions	48

Chapter		Page
V	SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS (EXECUTIVE BRIEF)	51
	A. Introduction	51
	B. Policies and Procedures	51
	C. Program Perspective	52
	D. Criteria for Reporting Activity Excess, Making Materiel Return Decisions and Granting Credit	52
	1. DoD-Managed Materiel	52
	2. GSA-Managed Materiel	54
	E. Recommendations	54

Appendix

	A. DASD(SM&S) Memorandum, Subject: Criteria for Return of Materiel for Credit, 29 November 1976	57
	Study Assignment	57
	Study Plan	59
	B. Statistical Data	63
	C. Glossary of Terms and Definitions	73
	D. Alternative Method for Calculation of Breakeven Points	75

LIST OF TABLES AND FIGURES

Tables		Page
III-1	Materiel Returns Documents	11
III-2	DoD Wholesale Stock Fund Returns With Credit	12
III-3	DoD Wholesale Stock Fund Returns Without Credit	13
III-4	DoD and GSA Wholesale Stock Fund Materiel Returns	14
III-5	GSA Credit Returns Program Operating Statement	14
III-6	DoD Response to Reports of Excess	15
III-7	GSA Response to Reports of Excess	16
III-8	Rationale for GSA Rejections	17
III-9	GSA Credit Returns Processing	18
III-10	Excess Materiel Offers to GSA, Documents	19
III-11	Excess Materiel Offers to GSA, Dollars	19
III-12	Excess Materiel Offers to GSA Within Current Reporting Criteria, Documents	20
III-13	Excess Materiel Offers to GSA Within Current Reporting Criteria, Dollars	20
III-14	Total Materiel Authorized for Return	22
III-15	Materiel Authorized for Return with Credit	23
IV-1	Procurement Cost Avoidance Per Dollar of Materiel Returned to Wholesale Inventory	28
IV-2	Inventory Holding Cost and Associated Present Value Factors	30
IV-3	Cost Avoidance Per Dollar of Materiel Returned	31
IV-4	Net Gain or Loss on Disposal of Batch Lots	36
IV-5	Computation of Breakeven Values	38
IV-6	Variables Sensitized	39
IV-7	Estimated Cost of Proportional Credit Policy	47
IV-8	Impact of Credit Policy Change	47

******

Figures		
IV-1	Declining Materiel Value	43
IV-2	Methods for Applying Credit	45

CHAPTER I

INTRODUCTION

A. BACKGROUND

In November 1975, the General Services Administration (GSA) Federal Supply Service proposed a change to the Federal Property Management Regulations (FPMRs) which would raise the minimum dollar values required for items to be eligible for return to GSA for credit. The minimum dollar values proposed were: $50 (vice $25) for hand tools, Federal Supply Group (FSG) 51, and measuring tools, FSG 52; and $100 (vice $50) for items in certain other FSGs and Federal Supply Classes (FSCs).

During the Department of Defense (DoD) review of the proposed FPMR change, two Military Departments protested the increased minimum values required for return of materiel to GSA for credit. The Department of the Army said that the change "would permit more materiel... to be automatically referred to disposal or unnecessarily retained by field commands." The Department of the Navy stated that credit returns, approximating $700 thousand in Fiscal Year 1975, "could be reduced by one-half" and "cause the use of NSF cash to finance the requirements historically paid for with credit billings." Each of these Departments protested and pointed out that DoD Directive 4100.37, "Retention and Transfer of Materiel Assets" authorizes returns of materiel for credit with a minimum line item value of $10. The Army indicated that DoD and GSA policy regarding materiel returns with credit should be more consistent and suggested a study of the situation.

Subsequent to the DoD review of the proposed FPMR change, GSA informed the Defense Logistics Agency (DLA) that the new "minimums were developed as a result of a thorough analysis of the costs involved in returning items to stock." However, GSA deferred publication of the changes and suggested a joint DLA and GSA study aimed at (a) "identification of all cost factors relating to the return of items to inventory" and (b) "development of credit return procedures which reflect the maximum practical degree of uniformity."

In a memorandum dated 24 August 1976, DLA forwarded the GSA suggestion for a study to the Deputy Assistant Secretary of Defense (Supply, Maintenance and Services) (DASD(SM&S)) and proposed that such a study, if undertaken, would be an appropriate task for the Defense Logistics Analysis Office (DLAO). By a memorandum of 29 November 1976 (Appendix A) the DASD(SM&S) requested this Study.

B. STUDY OBJECTIVES

The DASD(SM&S) memorandum of 29 November 1976 and its enclosed study plan stated that the intent of the Study is "to resolve differences between Department of Defense (DoD) and General Services Administration (GSA) credit returns programs and develop rationale for establishing a consistent, practical credit return policy." Specific objectives were listed as follows:

a. Ascertain how DoD and GSA materiel returns are processed;

b. Determine the cost of effecting materiel returns;

c. Evaluate the cost versus the value of returning materiel to store; and

d. Recommend criteria for making credit return decisions and submit the criteria to the DoD and GSA for consideration.

C. STUDY SCOPE

The Study Plan indicates that the Study should:

-- Encompass "all stock fund materiel determined to be excess by an owning activity or Component and involve the decision criteria for determining whether the excess materiel shall be reported to the materiel manager (GSA, a Military Service or DLA) or automatically transferred to disposal"; and

-- Include a review and analysis of the "policies, criteria, and practices, and related costs, for reporting excess materiel, making return determinations, and returning materiel."

As the Study progressed, it became clear that the policies, criteria, and practices for reporting excess materiel, making return determinations, and returning materiel do not consistently differentiate between stock fund and other materiel. Therefore, the Study's data accumulation and analyses include other than stock fund transactions whenever such transactions could not be separately identified or were of value to the analysis.

The Study excludes consideration of why materiel becomes excess.

D. STUDY TEAM COMPOSITION

The Study Team was composed of two full-time members of the Defense Logistics Analysis Office Staff, including a Team Leader, plus a team member from the General Services Administration.

E. STUDY APPROACH

During the course of the Study, the team:

a. Reviewed DoD and GSA publications, reports, studies and issuances pertaining to the policies and practices for reporting excesses and processing materiel returns.

b. Obtained briefings from the Military Services, DLA, and GSA regarding the nature and scope of their programs for reporting excesses and processing materiel returns.

c. Conducted on-site field research at the following DoD and GSA activities:

- -- U.S. Army Missile Command, Huntsville, Alabama;
- -- Fort Eustis, Virginia;
- -- New Cumberland Army Depot, New Cumberland, Pennsylvania;
- -- Naval Supply Center, Norfolk, Virginia;
- -- Naval Air Station, Norfolk, Virginia;
- -- Ships Parts Control Center, Mechanicsburg, Pennsylvania;
- -- Warner Robins Air Logistics Center, Warner-Robins, Georgia;
- -- Langley Air Force Base, Virginia;
- -- Marine Corps Logistics Support Base Atlantic, Albany, Georgia;
- -- Defense Automatic Addressing System Office, Dayton, Ohio;
- -- Defense Electronics Supply Center, Dayton, Ohio;
- -- Defense Depot, Mechanicsburg, Pennsylvania; and
- -- General Services Administration Supply Distribution Division, Region 2, Bayonne, New Jersey.

d. Evaluated the costs and benefits of various alternatives as prescribed by the Study Objectives and made recommendations. Because of the nature of the Study, the Study Team approach was aimed at maximizing benefits to the Government as a whole, but not necessarily to DoD, a particular DoD Component, or GSA.

F. REPORT ORGANIZATION

The findings, analyses, observations or conclusions, and recommendations of this Study are presented in the following Chapters:

-- Chapter II provides a brief description of DoD and GSA policies and practices applicable to materiel returns.

-- Chapter III displays the dollar value and transaction volume within the DoD and GSA materiel returns programs, the relative magnitude of the two programs, and the potential impact of changing materiel return criteria.

-- Chapter IV delineates: (1) costs associated with reporting activity excesses and returning or disposing of materiel, (2) the potential value of materiel under each circumstance, and (3) the relative value of materiel return vice disposal.

-- Chapter V summarizes key factors and conclusions from the preceding Chapters and sets forth the Report's recommendations.

To the extent used directly for specific analyses, data is displayed with the findings and analyses of the applicable chapter. More detailed backup data is displayed in Appendix B which is cited when data is used in the Study.

Certain terminology used in the report (for example, "Approved Force Acquisition Objective") is listed and defined in Appendix C.

CHAPTER II

POLICIES AND PROCEDURES

A. INTRODUCTION

The primary policy guidance for the Department of Defense (DoD) materiel returns program is contained in DoD Directive 4100.37 of June 7, 1974, subject: Retention and Transfer of Materiel Assets. The returns policy of the General Services Administration (GSA) is promulgated by GSA in the Federal Property Management Regulations (FPMRs). It is the purpose of this Chapter to outline briefly the DoD and GSA policies and related procedures as they apply to this Study.

B. POLICIES

1. DoD. DoD policies for determining DoD excess, reporting it, and granting credit, contained in DoD Directive 4100.37, are summarized as follows:

-- DoD activities holding retail assets will retain stocks of secondary items pending issue, equivalent to the sum of their approved Prepositioned War Reserve Requirement (PWRR), Requisitioning Objective (RO) and a minimum of two and a maximum of three years' worth at anticipated issue or wear-out rates.

-- Retail assets which are in excess of the retention limit will be stratified as potential DoD excess.

-- Each activity will report the potential DoD excess to the wholesale manager if the on-hand quantity is totally excess and is over $10 in value, or if part of the on-hand quantity is excess and is over $50 in value. Totally excess materiel valued at $10 or less will be processed to disposal while partial excess under $50 will be retained in stock.

-- Inventory managers will retain wholesale assets up to the sum of the Approved Force Acquisition Objective (AFAO), Approved Force Retention Stock (AFRS), Economic Retention Stock (ERS) and Contingency Retention Stock (CRS).

-- Inventory managers will give credit for returned materiel when the stock is within the AFAO, less the unfunded portion of the war reserve requirement.

-- The shipper normally pays packing, crating, handling and transportation costs to return materiel to the wholesale system with or without credit.

-- Activities outside the Continental United States (CONUS) subject to the operation at the Defense European and Pacific Redistribution Activity (DEPRA) are exempted from the above policies to the extent excess materiel can be redistributed within the overseas theaters.

2. GSA. The GSA policies for return of materiel are summarized from the FPMR as follows:

-- The item must be a stores item; i.e., an item normally stocked in a GSA depot.

-- The minimum dollar value per line item based on the current selling price must be:

* $25 for Federal Supply Groups (FSGs) 51 and 52, hand tools and measuring tools.

* $300 for furniture, shelving materiel, cleaning compounds, preservatives, and other materiel in Federal Supply Classes (FSCs) 7105, 7110, 7125, 7195, 7930, 8010, 8030, and 8040.

* $50 for all other items, except subsistence (FSG 89), tires (FSC 2610), standard forms (FSC 7540), boxes, crates, cartons (FSC 8115) which shall be considered excess by the holding activity and shall not be reported to GSA.

-- Credit will be given at 80% of the current selling price for Condition Code A (serviceable) or 30% for Condition Code F (reparable) and Condition Code C (requires parts).

-- Materiel will be authorized for credit return only if a requirement exists within the Requisitioning Objective.

C. PROCEDURES

The technique for reporting potential DoD excess materiel to the respective wholesale managers was developed in 1963 by the Defense Supply Agency (now the Defense Logistics Agency (DLA)). Document Identifier Codes (DICs) "FTE" for the report and "FTR" for the response were originated. Auxiliary DICs were established to be used

in submitting and responding to follow-ups. These initial procedures developed by DLA were adopted, with many significant variations, by the DoD Components and GSA.

1. Current Basic Processes. The basic DoD and GSA processes are described in general terms in the following paragraphs.

a. DoD activities review requirements and on-hand assets periodically. Assets above requirements are stratified as either "total" or "partial" excess and reported to an inventory manager in accordance with the levels described in DoD Directive 4100.37. These assets are reported through submission of an Excess Report. Normally, this report is transmitted to the inventory manager via the Automatic Digital Network (AUTODIN) and the Defense Automatic Addressing System (DAAS). Excess reports submitted by European and Pacific activities are first subject to redistribution by DEPRA to fill requisitions originating overseas.

b. Upon receipt of these excess reports, the inventory manager compares wholesale assets against wholesale requirements and authorizes returns to fill deficiencies. Disposition instructions, in response to the excess report, are made with an advice code authorizing return for credit, return without credit, or disposal. The depot to which the materiel is to be returned is indicated in the response document.

c. Upon receipt of disposition instructions from the inventory manager, the reporting activity either returns the materiel to a wholesale depot or turns the materiel into property disposal; in some cases, the reporting activity decides to hold the materiel.

2. Unique Practices. While the materiel returns program has a set of basic processes, a number of practices vary significantly among the DoD Components and GSA. Several of these are described in the following paragraphs.

a. DoD and GSA

DoD wholesale depots normally receive and process materiel returns in the same physical location and in the same general manner as receipts from other sources. Inspection is limited to receipts with obvious damage. Repackaging and re-marking is done only when the old packaging cannot be used. A separate cost accounting system is not maintained for receipts from returns. Cost and workload data for returns are consolidated with all other receipts.

On the other hand, at GSA activities, returns are processed in an area physically separated from normal receipt processing with most returns subjected to 100% inspection. In Fiscal Year 1976, 18% of these returns were subsequently transferred to disposal, and this rate increased to 26% for the period July 1976 through March 1977. Most of the materiel is repacked, relabeled and re-marked so that the materiel and its packaging are in like-new condition. A separate cost accounting system for materiel returns is maintained at each credit return activity.

Two other significant differences between DoD and GSA are: (1) GSA grants credit only for requirements up to the RO; and (2) GSA does not authorize return of materiel without credit.

b. Army. The Army is currently involved in several programs which are outside of the "normal" materiel returns process. For example, materiel excess generated from the drawdown of Okinawa has been returned to CONUS for subsequent redistribution within the Army. DLA and GSA stocks have been placed in Army depots and Army requisitions intended for DLA and GSA are being filled with these stocks. The same general procedure is planned for materiel being returned as a result of the European depot system drawdown. The Army has also instituted a moratorium on disposal of excesses being generated by CONUS activities pending final evaluation of a plan for redistribution of those excesses.

c. Navy and Marine Corps. The Navy and Marine Corps are receiving materiel at wholesale supply depots as a result of "Materiel Turned Into Store (MTIS)" and "Rollback" from ships, operating units, and other supported customers which had not been reported previously to the wholesale manager for disposition instructions. The usual procedure is to take up the materiel in stock and then report the receipt to the inventory manager. Although the inventory manager may not have a requirement, the receipt and storage expense has already been incurred when the inventory manager receives the report. On occasion, a pre-interrogation procedure is used to preclude turn-in of materiel which obviously exceeds wholesale requirements. When used, this procedure does identify obsolete and terminal items.

d. Air Force. Air Force limits for return of Air Force managed materiel are different from DoD prescribed limits. In general, the Air Force first reviews reports of excess and directs redistribution where the excess can satisfy an existing backorder. If the report is for total excess, disposal is directed if available wholesale assets exceed the AFAO. A $10 return limit is used if wholesale assets are below the reorder level and a $25 return limit is used if wholesale

assets are above the reorder level and below the AFAO. For reports of partial excess a return is authorized only if the item is in a buy position, otherwise the base is advised to report the excess again during the next cycle. Credit is not normally granted to Air Force bases, since the excess materiel is already carried in the Air Force stock fund. Credit is granted to other Components, but only for materiel required to fill the wholesale Requisitioning Objective.

e. Defense Logistics Agency. A minimum return limit of $7 is being used by DLA inventory managers instead of the $10 limit specified by DoD Directive 4100.37.

3. Current and Projected Procedural Developments

As the procedures developed by the DoD Components and GSA became more varied, problems began to occur with the interchange of data and the need for a standard system for returns was realized. As a result, a standard DoD and GSA Materiel Returns Program (MRP) was developed for inclusion in MILSTRIP. Formal MRP procedures were published in September 1974 and scheduled for DoD implementation in September 1976 and GSA implementation in July 1977.

The Department of the Army, however, advised that due to other developing programs, implementation of the MRP procedures would have to be delayed. Due to the differences between the old procedures and the new procedures, the DoD Components determined that MRP must be implemented DoD-wide at the same time. Thus, implementation of MRP in September 1976 was cancelled and materiel returns continue to flow using the nonstandard procedures. In conjunction with moving their inventory control point from Pennsylvania to Georgia, the Marine Corps programmed for the use of MRP procedures; but until the MRP is effected the Marine Corps Logistics Support Base Atlantic is handling materiel returns transactions manually. MRP implementation is now scheduled for 1 September 1978.

D. KEY OBSERVATIONS AND CONCLUSIONS

The review of DoD and GSA policies and procedures used for reporting excesses and effecting materiel returns decisions indicates that:

1. Materiel returns policies, procedures and practices vary significantly between DoD and GSA.

2. DoD materiel return policy is interpreted and implemented through varying procedures and practices by the DoD Components.

3. The different policies, procedures and practices directly and indirectly effecting materiel returns can be expected to yield varying results within the materiel returns programs.

4. Implementation of standard DoD/GSA Materiel Returns Program procedures within MILSTRIP should be expedited, as one step toward more consistent materiel returns program results.

CHAPTER III

PROGRAM PERSPECTIVE

A. INTRODUCTION

The purpose of this Chapter is to display the magnitude of the Department of Defense (DoD) and General Services Administration (GSA) materiel returns programs and examine the potential impact of changing excess reporting criteria and return levels.

B. MATERIEL RETURN DOCUMENT VOLUME

Chapter II discussed the document flow associated with reporting and returning excess materiel. Table III-1 lists the Document Identifier Codes, document title, and the number of documents associated with the materiel returns processes.

Table III-1

MATERIEL RETURNS DOCUMENTS
(April 1976 through March 1977)

Document Identifier Code	Document Title	Number of Documents
FEN	Excess Notification Card	390
FES	Response to Excess Notification Card	39
FTC	Cancellation Reports	603,161
FTE	Excess Reports	2,550,654
FTF	Follow-up to Excess Report	628,114
FTK	Follow-up to Customer	110,152
FTL	Customer Response to Follow-up	12,923
FTQ	DAAS Notification Reroute	252,389
FTR	Customer Excess Materiel Reply	2,938,482
FTS	Customer Excess Follow-up Reply	391,750
FTZ	Dollar Value Granted; Materiel Received	586,953
Other FT-	Customer Excess Other	3,275
Total		8,078,282

Source: DAAS Logistics Information Data Service (LIDS) Report of March 1977

Of the over eight million transaction documents displayed in Table III-1, about 2.5 million (32%) are excess reports; about 2.9 million (36%) are basic responses to submitters; and about 0.6 million (7%) are reports indicating credit will be granted.

In addition to the eight million "FT" series documents shown in Table III-1, an estimated three million documents are generated when excess materiel is authorized for return. For example, for each materiel return that is authorized, the inventory manager forwards a prepositioned materiel receipt card to the depot designated to receive the materiel. Upon receipt of the returned materiel, the depot forwards a receipt card to the inventory manager who then generates billing documents for those receipts for which credit is granted.

C. DoD COMPONENTS AND GSA

Tables III-2 and III-3 show stock fund returns, with credit and without credit, to DoD wholesale inventory managers for Fiscal Years 1975 and 1976.

Table III-2

DoD WHOLESALE STOCK FUND RETURNS WITH CREDIT
($ millions)

Component	FY 1975		FY 1976	
	Value	%	Value	%
Army	$48.4	31.6	$57.5	27.4
Navy	18.0	11.8	45.3	21.6
Air Force	31.5	20.6	32.0	15.3
Marine Corps	0.4	0.3	0.4	0.2
DLA	54.7	35.7	74.3	35.5
Total	$153.0	100.0	$209.5	100.0

Source: Appendix B, Table B-1

Table III-3

DoD WHOLESALE STOCK FUND RETURNS WITHOUT CREDIT
($ millions)

Component	FY 1975		FY 1976	
	Value	%	Value	%
Army	$178.0	47.1	$205.7	40.7
Navy	66.2	17.5	133.0	26.3
Air Force	48.5	12.8	52.8	10.4
Marine Corps	11.3	3.0	3.0	0.6
DLA	73.8	19.6	111.3	22.0
Total	$377.8	100.0	$505.8	100.0

Source: Appendix B, Table B-1

These tables demonstrate that each of the Components having a major inventory management program has a significant volume of materiel returned — with credit and without credit. The magnitude of returns with credit and without credit was significant in Fiscal Years 1975 and 1976; data for Fiscal Year 7T (one quarter) indicates a continuing high volume of returns ($59 million with credit and $137 million without credit) to DoD wholesale inventory managers.

During the same time period returns to GSA were as follows:

Fiscal Year	Value
1975	$4.8 million
1976	3.7 million
7T	0.7 million (one quarter)

Table III-4 displays the relative values and percentage of the DoD and GSA returns programs.

Table III-4 data illustrates that during each of the three periods:

-- DoD returns with credit represented about 29% of the DoD-GSA returns value;

-- DoD returns without credit represented about 70% of the DoD-GSA returns value;

-- GSA returns (with credit) represented less than 1% of the DoD-GSA returns value, and

-- The DoD segment of the overall program is very large and, possibly increasing; while

-- The GSA returns volume is decreasing.

Table III-4

DoD AND GSA WHOLESALE STOCK FUND MATERIEL RETURNS
($ millions)

Return Category	FY 1975		FY 1976		FY 7T 1/	
	Value	%	Value	%	Value	%
DoD Returns with Credit	$153.0	28.6	$209.5	29.1	$59.0	30.0
GSA Returns	4.8	0.9	3.7	0.5	0.7	0.4
DoD Returns without Credit 2/	377.8	70.5	505.8	70.4	137.0	69.6
Total	$535.6	100.0	$719.0	100.0	$196.7	100.0

Source: Appendix B, Table B-1

1/ Data for one quarter.
2/ GSA does not have a "returns without credit" program segment.

D. GSA CREDIT RETURNS FINANCIAL STATEMENT

Table III-5 displays GSA summary operating statements for Fiscal Years 1974-1976 for the overall GSA credit returns program.

Table III-5

GSA CREDIT RETURNS PROGRAM OPERATING STATEMENT
($ millions)

Description	FY 1974	FY 1975	FY 1976
A Standard Price of Materiel Placed in Inventory	$5.8	$4.8	$3.7
B Estimated Commercial Purchase Price (89% of A)	5.2	4.3	3.3
C Less Credit Granted	3.9	3.3	2.5
D Estimated Value of Materiel to GSA (B - C)	1.3	1.0	0.8
E GSA Operating Expense	1.7	1.8	1.3
F Profit or (Loss) (D - E)	(0.4)	(0.8)	(0.5)

Source: GSA Headquarters Briefing and subsequent data submissions.

The table reflects small ($0.4 to $0.8 million) net losses for each of the three fiscal years; however, it also shows that materiel valued at $3.3 to $5.2 million was placed into inventory during each fiscal year at an operating cost of $1.3 to $1.8 million. Thus, from a GSA perspective the credit returns program shows a loss, but from a Federal Government viewpoint the materiel placed in store has value greater than GSA program costs.

E. INVENTORY MANAGER RESPONSES TO REPORTS OF EXCESS

1. General. Specific information concerning the dollar value of individual line items of excess materiel being reported and returned is not generally available. Therefore, to determine the potential workload and financial impact of any change to existing materiel returns limits, the Defense Automatic Addressing System (DAAS) Office was requested to retain all materiel returns documents processed from August through December 1976. Inventory manager responses to reports of excess were then stratified by dollar value and type of response for this period and are the source of data for several analyses in this Report.

2. Type of Response

a. DoD

Table III-6 displays inventory manager response to activity excess reports, aggregated by Component and type of action: return with credit; return without credit; or disposal authorized.

Table III-6

DoD RESPONSE TO REPORTS OF EXCESS 1/
($ millions)

Component	Credit	No Credit	Disposal	Total
Army	$90.6	$362.4	$162.8	$615.8
Navy	40.2	153.5	15.3	209.0
Air Force	9.2	171.4	44.4	225.0
Marine Corps	0.0	0.3	13.8	14.1
DLA	136.3	89.3	169.8	395.4
Total	$276.3	$776.9	$406.1	$1,459.3

Source: DAAS Service Report #512, 3 March 1977 and HQ DLA for DPSC

1/ Data extrapolated to an annual basis using actual data for August through December 1976.

Analysis of the reports of excess authorized for return indicates the following:

Type of Return	Value	%
Credit	$276	26
No Credit	777	74

Since credit is normally granted for materiel requirements within the Approved Forces Acquisition Objective (AFAO), about one-fourth of the returned materiel is expected to be required within two years. The remaining three-fourths of the materiel returns, without credit, are normally to fill requirements expected to occur from two to six years in the future. The eventual utilization of materiel returned without credit is dependent on the accuracy of long range demand forecasts. Even when the requirement is accurately predicted the materiel may incur up to six years inventory holding costs before it is issued.

b. GSA

Table III-7 shows GSA responses to reports of activity excess from Fiscal Year 1974 through Fiscal Year 1976.

Table III-7

GSA RESPONSE TO REPORTS OF EXCESS
($ millions)

	FY 1974	FY 1975	FY 1976
Excess Reported	$136.0	$181.0	$76.1
Credit Return Authorized	12.0 (9%)	11.0 (6%)	5.5 (7%)
Rejected	124.0	170.0	70.6

Source: GSA Headquarters Briefing and GSA Data Submission

Table III-7 indicates that less than 10% of the value of materiel reported excess has been authorized for return with credit. GSA does not authorize return of materiel without credit.

Table III-8 displays the reasons reported excesses were not authorized for return.

Table III-8

RATIONALE FOR GSA REJECTIONS
($ millions)

Reason for Rejection Code	FY 1974		FY 1975		FY 1976	
	Value	Percent	Value	Percent	Value	Percent
No Requirement	$26.5	21	$57.0	34	NA 1/	NA 1/
Not Stocked	86.0	70	95.0	56	NA	NA
Other 2/	11.5	9	18.0	10	NA	NA
Total Rejected	$124.0	100	$170.0	100	$70.6	100

Source: GSA Headquarters Briefing

1/ Not available. GSA has discontinued accumulation of data used to develop the breakout by reason.

2/ Other includes garbled data, unrecognizable National Stock Numbers (NSNs), and reports less than minimum levels.

During the period depicted in Table III-8, two major policy changes were implemented by GSA:

-- In January 1975, the maximum return quantity was reduced from requisitioning objective (RO) deficiencies plus two years demand to RO deficiencies.

-- In August 1975, the minimum returns limits were changed from the $25, $50, and $300 limits published in the Federal Property Management Regulations (FPMR) to the $50, $100, and $300 limits currently being proposed by GSA. In January 1977, the old limits were reinstated pending completion of this Study.

The exact impact of these two changes cannot be determined; however, these changes are factors influencing the decreased amount and percentage of materiel authorized for return. Offers rejected for "no requirement" increased from 21% to 34% in Fiscal Year 1975. This 13% increase in six months equates to over $23 million, nearly double the amount of materiel actually authorized for return. Table III-8 also shows that well over half the offers made in Fiscal Year 1974 and Fiscal Year 1975 were rejected because the materiel was not stocked, that is, materiel managed by GSA, but purchased directly from commercial sources.

F. POTENTIAL IMPACT OF MODIFIED MATERIEL RETURNS CRITERIA

1. GSA

Table III-9 displays the value of excess materiel offered to GSA for each of three fiscal years. Also displayed are: the value of credit returns authorized by GSA, the value of materiel actually received by GSA return sites, the value of materiel actually placed into inventory at GSA depots, and the value of credit actually granted. According to GSA data approximately 95% of the excess offered to GSA for return is offered by DoD activities. It is assumed, in displaying and using Table III-9 data, that 95% of each category, "offers" through "credit granted," is associated with DoD transactions.

Table III-9

GSA CREDIT RETURNS PROCESSING
($ millions)

Description	FY 1974		FY 1975		FY 1976	
	Value	%	Value	%	Value	%
Excess Offered	$136.0	100	$181.0	100	$76.1	100
Credit Return Authorized	12.0	9	11.0	6	5.5	7
Received by GSA	6.9	5	5.5	3	4.5	6
Placed in Inventory	5.8	4	4.8	3	3.7	5
Credit Granted	3.9	3	3.3	2	2.5	3

Source: GSA Headquarters Briefing

Table III-9 shows that over three fiscal years only about 5% of the excess materiel being offered is eventually placed in inventory, and that the credit granted is about 2 to 3% of the value of excess offers.

Tables III-10 and III-11 show the number of line items and the value of excess materiel being reported to GSA, arrayed by dollar strata for the categories of materiel having separate return limits: $25 for hand and measuring tools; $300 for furniture, shelving materiel, and cleaning compounds; and $50 for all other items authorized for return. The data includes all submissions via the Defense Automatic Addressing System, including those below current reporting criteria.

Table III-10

EXCESS MATERIEL OFFERS TO GSA [1/]
(Documents)

Dollar Strata	$25 Limit ($50 Proposed)	$50 Limit ($100 Proposed)	$300 Limit	Total Reports
0-25	16,082	5,515	1,320	22,917
26-50	7,906	2,635	919	11,460
51-100	11,614	8,501	1,822	21,937
101-300	10,574	11,769	3,518	25,861
over 300	5,774	13,294	6,245	25,313
Total	51,950	41,714	13,824	107,488

Source: DAAS Service Report Number 512

1/ Data extrapolated to an annual basis using actual data for August through December 1976.

Table III-11

EXCESS MATERIEL OFFERS TO GSA [1/]
($ millions)

Dollar Strata	$25 Limit ($50 Proposed)	$50 Limit ($100 Proposed)	$300 Limit	Total Value Offered
0-25	$0.24	$0.06	$0.02	$0.32
26-50	0.19	0.10	0.03	0.32
51-100	0.82	0.62	0.13	1.57
101-300	1.80	2.09	0.63	4.52
over 300	7.49	56.41	9.40	73.30
Total	$10.54	$59.28	$10.21	$80.03

Source: DAAS Service Report Number 512

1/ Data extrapolated to an annual basis using actual data for August through December 1976.

Analysis of data in Tables III-10 and III-11 demonstrates that strictly enforcing the current criteria of $25, $50, and $300 would have resulted in reduced line item and dollar value reporting of:

Line Items	$ Value
31,811	$1.2 million
29.6%	1.5%

Tables III-12 and III-13 show the excess offers without the erroneously submitted items.

Table III-12

EXCESS MATERIEL OFFERS TO GSA 1/
WITHIN CURRENT REPORTING CRITERIA
(Documents)

Dollar Strata	$25 Limit ($50 Proposed)	$50 Limit ($100 Proposed)	$300 Limit (No Change)	Total Reports
26-50	7,906	XXX	XXX	7,906
51-100	11,614	8,501	XXX	20,115
101-300	10,574	11,769	XXX	22,343
over 300	5,774	13,294	6,245	25,313
Total	35,868	33,564	6,245	75,677

Source: DAAS Service Report Number 512

1/ Data extrapolated to an annual basis using actual data for August through December 1976.

Table III-13

EXCESS MATERIEL OFFERS TO GSA 1/
WITHIN CURRENT REPORTING CRITERIA
($ millions)

Dollar Strata	$25 Limit ($50 Proposed)	$50 Limit ($100 Proposed)	$300 Limit (No Change)	Total Value Offered
26-50	$0.19	XXX	XXX	$0.19
51-100	0.82	$0.62	XXX	1.44
101-300	1.80	2.09	XXX	3.89
over 300	7.49	56.41	$9.40	73.30
Total	$10.30	$59.12	$9.40	$78.82

Source: DAAS Service Report Number 512

1/ Data extrapolated to an annual basis using actual data for August through December 1976.

Analysis of data in Tables III-12 and III-13 indicates that modifying FPMR reporting criteria for GSA materiel as proposed by GSA would have the following impact:

** Reduce the number of line items reported by 16,407 (21.7% of the line items submitted within current criteria).

** Reduce the dollar value reported by $810 thousand (1.6% of the line items value submitted within current criteria).

Further analysis of the data indicates that modifying the FPMR reporting criteria for GSA items to $100 and $300 would:

** Reduce the number of line items reported by 28,021 (34.0% of the line items submitted within current criteria).

** Reduce the dollar value reported by $1.6 million (2.1% of the line items value submitted within current criteria).

Continued analysis of the data indicates that modifying the FPMR reporting criteria for GSA items to $300 across the board would:

** Reduce the number of line items reported by 50,334 (66.5% of the line items reported within current criteria).

** Reduce the dollar value reported by $5.5 million (7.0% of the line items value submitted within current criteria).

GSA to DoD actual credit returns for Fiscal Year 1976 had a value of $3.7 million. GSA has indicated that approximately 90% of the return value ($3.3 million) was in the handtools (FSG 51) category; the remaining 10% (about $0.4 million) of the return value was in the other categories. Applying this distribution (90% and 10%) to the "offers" as distributed in Table III-13 indicates that the maximum credit return loss (GSA to DoD) expected would be as follows:

Under GSA Proposed Criteria ($50/$100/$300) - - - - $63 thousand
Under $100/$300 Criteria - - - - - - - - - - - - - - $224 thousand
Under $300 Across-the-Board Criteria - - - - - - - $914 thousand

In aggregate, data demonstrate that of itself, modifying the FPMR criteria for reporting excess GSA materiel to GSA for credit as suggested by GSA would not have a significant financial impact on any single activity, DoD Component, or the DoD as a whole.

Also, based on this analysis alone, modification to other criteria such as $100/$300 may not have a significant impact.

2. DoD

Tables III-14 and III-15 array DoD inventory manager responses to reports of excess, aggregated by dollar strata of the return "authorization" transaction, for total return authorizations and for return with credit authorizations, respectively.

Table III-14

TOTAL MATERIEL AUTHORIZED FOR RETURN 1/

Dollar Strata	Dollar (millions)			Documents		
	Value	Actual %	Cum %	Number	Actual %	Cum %
0-25	$4.3	0.4	0.4	268,250	18.3	18.3
26-50	7.6	0.7	1.1	206,320	14.2	32.5
51-100	19.2	1.8	3.0	265,778	18.2	50.7
101-300	60.4	5.7	8.7	341,128	23.3	74.0
over 300	956.4	91.3	100.0	380,025	26.0	100.0
Total 2/	$1,047.9	100.0	100.0	1,461,501	100.0	100.0

Source: Appendix B, Tables B-2 and B-3

1/ Data extrapolated to an annual basis using actual data for August through December 1976.

2/ Excludes medical responses from DPSC due to data problem.

Table III-15

MATERIEL AUTHORIZED FOR RETURN WITH CREDIT [1]

Dollar Strata	Dollars (millions)			Documents		
	Value	Actual %	Cum %	Number	Actual %	Cum %
0-25	$2.0	0.7	0.7	126,604	19.3	19.3
26-50	3.6	1.3	2.0	97,490	14.9	34.2
51-100	9.6	3.5	5.5	133,320	20.4	54.6
101-300	27.9	10.2	15.7	158,935	24.2	78.8
over 300	231.0	84.3	100.0	139,308	21.2	100.0
Total [2]	$274.1	100.0	100.0	655,657	100.0	100.0

Source: Appendix B, Tables B-2 and B-3

1/ Data extrapolated to an annual basis using actual data for August through December 1976.

2/ Excludes medical responses from DPSC due to data problem.

Analysis of data in Tables III-14 and III-15 indicates that:

** As with the GSA data, a very high proportion of the line items have a line item value under $300 but account for a very low percentage of the dollar value of returns authorized.

** Unlike the GSA data, the absolute value of materiel authorized for return is relatively high in each of the document dollar strata shown: for example, $2.0 to $4.3 million in the $0-$25 stratum; $3.6 to $7.6 million in the $26-$50 stratum; and $9.6 to $19.2 million in the $51-$100 stratum.

Assuming that the materiel "authorized" for return by a materiel manager is required, modifying the DoD reporting criteria for DoD managed materiel to a higher value (e.g., to $25 or more) could have a very significant impact on individual activities submitting excess reports, the inventory manager making returns decisions, the wholesale depot receiving the materiel, and combinations of these within and among DoD Components. Any change to the current criteria for reporting and returning excess DoD materiel requires a supplementary analysis which considers the value of the materiel in relation to the cost of the return process.

G. KEY OBSERVATIONS AND CONCLUSIONS

The review and analysis of the respective GSA and DoD materiel returns programs indicate that:

1. The materiel returns program for GSA-managed materiel is very small; less than 1% of the materiel returns program for DoD-managed materiel.

2. From a GSA perspective its credit returns program shows a loss, but from a Federal Government viewpoint the materiel placed in store has value greater than GSA program costs.

3. The change in GSA policy whereby returns are authorized only to satisfy deficiencies within the requisitioning objective has had a significant impact on the decreasing value of GSA materiel returns.

4. Modifying the FPMR criteria for reporting excess GSA-managed materiel to GSA from the present $25, $50, and $300 criteria to the $50, $100, and $300 criteria recommended by GSA will not have a significant financial impact on any DoD activity, a single DoD Component, or DoD as a whole.

5. Absolute values within the DoD materiel returns program are so large (e.g., $2 million to $4.3 million in the under $25 per line item category) that modifying the DoD criteria for reporting excess DoD-managed materiel to DoD materiel managers from the present $10 criterion could have a significant impact on the reporting activity, the inventory manager, and the wholesale depot.

6. Having separate, different excess materiel reporting and return criteria for GSA-managed and DoD-managed materiel is rational as long as materiel management policies and practices which influence materiel return costs are nonstandard.

CHAPTER IV

CRITERIA FOR REPORTING ACTIVITY EXCESS, MAKING MATERIEL RETURN DECISIONS, AND GRANTING CREDIT

A. INTRODUCTION

1. Range of Options. After an activity excess has been determined, the initial decision required is whether to transfer the excess materiel to disposal or to report the excess to the inventory manager for disposition instructions. If the excess is reported, the inventory manager or his agent may direct any or a combination of four actions: (1) hold the excess in place; (2) redistribute to a requiring activity; (3) return to a wholesale storage depot; or (4) transfer to disposal. Under current operating policies and practices, however, only two of these options are practical and routinely applied. These applied options are return or dispose. Therefore, within the scope of this Study, the criteria for the following actions are evaluated:

** The retail activity's decision to transfer excess materiel to disposal or report it to an inventory manager, and

** The wholesale manager's decision to authorize return of materiel to the wholesale system (after reporting) or transfer it to disposal.

2. Assumptions. Throughout the return versus dispose discussion two basic assumptions are made: first, that an activity having a locally determined excess will not transfer materiel to disposal if a system-wide short supply situation is recognized; and, second, that materiel return to the wholesale system will be considered only when there is a system requirement within established policy (DoD Directive 4100.37).

3. Basic Approach

The basic approach to be used in developing excess reporting criteria and materiel return criteria is that excess materiel should be returned whenever it is cost effective to do so. Therefore, this excess materiel to wholesale inventory, compares costs with benefits, and presents a breakeven point equation for use in making reporting and return decisions. The breakeven point for returning excess materiel is that dollar value at which the benefits from the return equal the cost of making the return; that is, the breakeven point occurs where:

$$\text{Value of Returned Materiel} = \frac{\text{Cost of Return - Net Cost of Disposal}}{\text{Value per Dollar}}$$

In making these analyses the following factors are considered:

Value of Potential Materiel Return:

- Avoidance of Purchase Costs
- Cost of Capital
- Inventory Holding Costs
- Present Value

Cost of Return:

- Document Processing Costs
- Transportation Costs
- Wholesale Depot Costs

Net Cost of Disposal:

- Disposal Processing Costs
- Potential Value of Returns from Disposal

Local activity picking, packing, and handling costs are excluded from these analyses because they will occur whether materiel is returned or transferred to disposal and, to the extent possible, the analyses are limited to consideration of "differential costs." Differential costs are defined as those costs that would be different as a result of a change to reporting or return limits. Costs that are unaffected by revised criteria need not be considered.

4. Data

In pursuit of the approach described above, the various factors listed must be assigned values. To the extent current data recording and reporting systems provide workload or cost data applicable to this analysis these data have been used. However, several cost factors, especially those associated with the materiel returns process, are not separately identified, reported, or accumulated in current Department of Defense (DoD) or DoD Component cost accounting systems; and, even when cost or man-hour data is available or reported, it is not readily comparable across Services or Agencies. For example, some cost accounting systems allocate only direct labor hours to a function while others allocate indirect, general and administrative expense and overhead to the same function.

The development of an accounting system designed only to obtain data for this Study would have been costly, time consuming, and impractical. Therefore, the Study Team queried Component headquarters and activities for estimated costs. The data provided were evaluated against on-site field research observations, and are used in conjunction with actual data provided from Component cost accounting systems to develop the cost factors presented in this Chapter.

B. VALUE OF MATERIEL RETURNS

The benefit derived from returning materiel to wholesale inventory is the cost avoidance which results from not having to obtain the materiel from a commercial source, discounted as necessary to recognize that it may be a future procurement that is avoided and that additional inventory holding costs may be incurred. In developing the benefit per dollar of returned materiel, the following factors will be considered.

-- Procurement costs avoided, including both the cost to order and receive materiel and the purchase price of the materiel.

-- Inventory holding costs, including cost of capital, obsolescence, other inventory losses, and storage.

-- Present value concept as applied to materiel returned in anticipation of a future requirement.

Each of these factors is separately discussed.

1. Procurement Costs Avoided

When a wholesale system requirement is satisfied by return of excess materiel, a commercial procurement is avoided. The costs avoided include the administrative cost of making the procurement, the cost of receiving the materiel, and the purchase price of the materiel. Table IV-1 shows the total procurement cost avoided, aggregated by DoD Component and expressed as cost avoidance per dollar of materiel returned.

The derivation of "Cost to Order" and the "Purchase Price" factors are discussed below.

Table IV-1

PROCUREMENT COST AVOIDANCE PER DOLLAR OF MATERIEL RETURNED TO WHOLESALE INVENTORY

Component	Cost to Order per Dollar	Purchase Price per Dollar	Cost Avoidance per Dollar
Army	$0.11	$0.91	$1.02
Navy	0.07	0.86	0.93
Air Force	0.11	0.87	0.98
Marine Corps	0.08	0.91	0.99
DLA	0.14	0.90	1.04
DoD Average 1/	0.11	0.89	1.00

Source: Appendix B, Tables B-9 and B-10

1/ DoD average is average of inventory manager rates and may not be average of Component rate.

a. Cost to Order Factor. Administrative procurement and receiving costs are normally referred to as the "cost to order," an element in most inventory control models. The cost to order includes those variable direct labor and support costs from the output of the requirement notice, through the mailing of the contract or order and includes processing the receipt from the contractor into the warehouse location. Variable contract administration costs are also included. Variable costs are those costs that will vary significantly in relation to the number of orders processed. The order cost for procurements less than $10,000 is used in determining the cost avoidance associated with a low dollar value stock fund return. The rate per dollar is the variable cost per order divided by the average value per order.

b. Purchase Price of Materiel. The standard or selling price of stock fund materiel includes the purchase price of the item plus a surcharge to compensate for first and second destination transportation costs, expected obsolescence, other inventory losses and other authorized expenses. The standard or selling price of materiel may also include an inflation factor to compensate for the expected increase in cost since the last pricing revision. The purchase price avoided is therefore the standard price less that portion of the surcharge not associated with first destination transportation.

2. Inventory Holding Cost. When excess materiel is returned to wholesale inventory in anticipation of a future requirement, the value of the returned materiel must be reduced to recognize inventory holding costs. The inventory holding cost consists of the charge for investment of capital tied up in inventory, expected obsolescence, other inventory losses and storage costs. An annual investment cost of 10% of the average on-hand inventory value is used by DoD. The remainder of the holding cost varies by commodity, however, DoD uses 1% as a standard storage cost rate in accordance with DoDI 4140.39. To recapitulate, the inventory holding cost or variable cost-to-hold rate is established as follows:

Element	Value
Investment cost	10% per dollar per year
Storage cost	1% per dollar per year
Obsolescence cost	Variable
Other losses	Variable

As indicated in Appendix B, Table B-10, overall inventory holding cost rates for each DoD Component are:

Army	.25
Navy	.23
Air Force	.24
Marine Corps	.15
Defense Logistics Agency	.19
Component Weighted Average	.22

3. Present Value Concept

a. The Concept

In a business, an investment of $1 today will not be made unless it is expected to get back somewhat more than $1 later on; that is, a return on the investment is expected. By the same token, if a certain proposal will produce earnings of $1 at the end of one year, somewhat less than $1 would be invested today. The expectation of receiving $1 at the end of the year, therefore, has a present value, a value today, of somewhat less than $1. How much less depends on how much the investment is expected to earn. If the investment is expected to earn 10%, the expectation of receiving $1 a year from now has a present value of $0.909, since, the investment of $0.909 today for one year at the rate of 10%, would earn $0.091 and have a value of $1 at the end of the year.

The present value for a payment of $1 to be received "n" years hence at any rate of return (i) can be found with the formula:

$$\frac{1}{(1 + i)^{n}}$$

b. The Concept Applied to Materiel Returns. The present value technique is used to determine the present value of materiel being held in inventory in anticipation of satisfying a future requirement. It is reasonable to assume that the procurement avoided because of the return would not be made until the requirement actually materializes. Therefore, the procurement costs avoided are discounted by the cost of capital to recognize the deferred procurement. The returned materiel is further discounted to recognize other inventory holding costs, i.e., storage, obsolescence, and other inventory losses, that are incurred in holding materiel for future requirements. This discounting is accomplished by using the present value discount factor associated with the inventory holding cost rate. The present value discount factors associated with holding inventory for one, two, three, or four years before it is required are contained in Table IV-2 for each DoD Component using that Component's inventory holding cost rate.

Table IV-2

INVENTORY HOLDING COST AND ASSOCIATED PRESENT VALUE FACTORS

Component	Inventory Holding Cost Rate	Present Value of $1			
		1 Yr Hence	2 Yrs Hence	3 Yrs Hence	4 Yrs Hence
Army	.25	.800	.640	.512	.410
Navy	.23	.813	.661	.538	.437
Air Force	.24	.806	.650	.524	.423
Marine Corps	.15	.877	.756	.658	.572
DLA	.19	.840	.706	.590	.490
DoD Average	.22	.820	.672	.551	.451

Source: Appendix B, Table B-10

4. Present Value of Return With a Current Requirement. Materiel returned with credit is normally to fill an existing requirement (i.e., an existing backorder or deficiencies to authorized levels) or to satisfy requirements expected to occur within the Approved Forces Acquisition Objective (AFAO). For the purposes of this calculation, returns to satisfy deficiencies within the AFAO are for a requirement that will occur one year beyond the current

date (i.e., approximately the midpoint of the AFAO). The procurement avoided because of the return would not be made for one year and one years inventory holding costs will be incurred before the requirement materializes. Therefore, the "present value" of materiel returned for use within the AFAO is the procurement cost avoidance discounted by the present value one year hence factor obtained from Table IV-2. For example, $1 of materiel returned to the Army to satisfy a current requirement is worth $1.02 to the inventory manager ($1 invoice value x $1.02 cost avoidance factor from Table IV-1). When this materiel must be held in inventory for one year before it is needed, it must be discounted to recognize the deferred procurement plus the inventory holding costs incurred, i.e., the "present value" of this materiel is only $0.82 ($1.02 x .800 present value one year hence factor from Table IV-2). Table IV-3 shows the cost avoidance per dollar both for materiel returned within the AFAO and materiel returned for use beyond the AFAO.

5. Present Value of Materiel Returned to Satisfy a Future Requirement. Materiel authorized for return to satisfy requirements beyond the AFAO but within the retention limit of the wholesale manager or to satisfy the unfunded portion of a war reserve requirement is normally without credit. Since the AFAO represents over two years of inventory and the retention limit is normally over six years stock, it is assumed for the purpose of this analysis that the procurement avoided because of the return would not be made until four years in the future, and four years holding costs are applied. The present value of this materiel is shown in Table IV-3.

Table IV-3

COST AVOIDANCE PER DOLLAR OF MATERIEL RETURNED

Component	Procurement Cost Avoidance (a)	Requirement Within AFAO		Requirement Beyond AFAO	
		Applicable Discount Factor (b)	Present Value of Return (a) x (b)	Applicable Discount Factor (c)	Present Value of Return (a) x (c)
Army	1.02	.800	.82	.410	.42
Navy	0.93	.813	.76	.437	.41
Air Force	0.98	.806	.79	.423	.41
Marine Corps	0.99	.877	.87	.572	.57
DLA	1.04	.840	.87	.490	.52
DoD Average	1.00	.820	.82	.451	.45

Source: Tables IV-1 and IV-2

C. COST TO RETURN

The Cost of Return element of the breakeven equation considers the following costs:

-- Document processing costs at the reporting activity, the inventory manager and the wholesale depot, from the initial report through the final receipt, including the updating of records and granting of credit when applicable.

-- Transportation costs to move the materiel to the wholesale depot.

-- The wholesale depot costs to process the returned materiel including receipt, inspection, care and preservation, storage, and reporting of the receipt.

Each of these costs was analyzed and is separately discussed.

1. Document Processing Costs

These are costs incurred by reporting activities, inventory managers, and wholesale depots. As noted in Chapter III, there are about 11 million documents processed each year compared to about one million actual returns, an 11 to 1 ratio. These documents include the report of excess, the inventory manager response, prepositioned materiel receipt cards, follow-up documents and responses to follow-ups, reports of receipt and billing documents. Most of these documents are prepared and processed by an automated data processing program at a very low cost per document; however, each document in the entire process has the potential for manual intervention and review.

Three Inventory Control Points (ICPs) provided estimates indicating that manual review is required on 1% to 17% of the materiel return documents received. One of the ICPs demonstrated that 10% of 20,000 materiel return documents were reviewed manually. Of the eight million documents displayed in Table III-1, three document categories can be expected to generate most of the manual review and/or processing. These three categories are: excess report, 2.6 million; follow-up reports, 0.7 million; reports of credit granted, 0.6 million; a total of approximately 3.9 million documents. If 10% of 3.9 million documents require manual review and processing at a cost of approximately $5 per document (30 minutes of GS-9/11 time), the document processing cost attributed to

manual processing will be $1.95 million per year. This cost, when applied to the one million annual returns, results in a cost of $1.95 per materiel return. Therefore, a cost estimate of $2 per return is used in this analysis as the applicable document processing cost.

2. Transportation Costs

Return of excess materiel to a wholesale storage depot at the inventory manager's direction may be via commercial mode as a consolidated shipment when large quantities or multiple lines are being returned, or via parcel post for single line items of low dollar value. The relevant transportation cost for use in this Study is the cost that would be avoided if excess materiel were automatically transferred to disposal in lieu of reporting to an inventory manager because of minimum reporting and return limits. During the field phase of this Study, special attention was paid to the weight and cube of excess materiel being received at wholesale depots that might be subject to a minimum return limit, i.e., materiel valued at less than $50 per line. Without exception, this materiel could have been returned via parcel post. Government parcel post rates are:

Weight (lbs)	Rate
Up to 14	$1.83
14 to 27	3.72
27 to 40	5.34
40 to 70	8.31

The Defense European and Pacific Redistribution Activity (DEPRA) Evaluation Report dated January 1977 shows the following data concerning number and weight of excess retail materiel shipped via non-traceable modes during the period 1 May 1976 through 31 July 1976.

Mode	Number of Items	Average Weight (lbs)
Air Parcel Post	1,623	5.61
Surface Parcel Post	2,817	6.11
Military Official	1,159	10.70
Total	5,599	6.92

The average weight of the excess materiel shipped via non-traceable means was 6.92 pounds per line item. Therefore, the minimum parcel post rate of $1.83 is used as the estimated transportation cost factor in this Study.

3. Wholesale Depot Costs

Wholesale depot receiving costs at representative depots are contained in Appendix B. By Component the average costs are:

Component	Average Cost
Army	$15.70
Navy	9.66
Air Force	8.43
Marine Corps	9.14
Defense Logistics Agency	9.07
Component Weighted Average	$11.60

The costs shown include receipt, inspection, care and preservation, storage and reporting of the receipt to the inventory manager. The costs, with the exception of the Defense Logistics Agency (DLA), are those to process receipts from new procurement and from returns for both investment and stock fund materiel. DLA depot costs are most applicable to the category of returned materiel being studied because DLA depots receive only stock fund materiel. Therefore, the average DLA cost of $9.07 is used in this analysis as the cost to process a low value materiel return that will be subject to a minimum return limit.

4. Recap of Cost to Return. The cost to return element in the breakeven equation represents those costs that will be incurred in returning excess retail materiel to wholesale inventory. These costs are:

Document Processing Cost	$2.00
Transportation Cost	1.83
Wholesale Depot Cost	9.07
Cost to Return	$12.90

D. NET COST OF DISPOSAL

1. Introduction. The net cost of disposal must be ascertained as a basis for reaching a "return" vice "dispose" decision. The two tangible factors required to determine the net cost of disposal are the disposal cost per line item and the potential benefit (i.e., dollar value) of any reutilization achieved plus the sale proceeds of the remaining materiel. Each of these factors is significantly affected by the number and value of disposal line items processed, and these factors are further influenced by the process for converting excess supply lime items to disposal line items. The

progression from excess supply line items to disposal line items and the evaluation of cost versus expected benefits for disposal line items is the subject of this paragraph.

2. Excess Line Items to Disposal Line Items. As excess line items are processed from a DoD activity to a disposal organization the conversion from a supply line item to a disposal line item may occur on a one for one basis (i.e., one supply line item may be processed in disposal as one disposal line item) or multiple excess supply line items may be converted to a "lot" representing a single disposal line item as a means of reducing costs, physical handling and administrative time to process these items through disposal. Prior to January 1977, disposal regulations only permitted batching or lotting for supply line items valued at $10 or less. In January 1977 the $10 limit was raised to $25 and in May 1977 the dollar limit was increased to $50 in order to permit additional batching. The revised policy will decrease the cost of the DoD disposal program by decreasing the number of disposal line items processed.

3. Property Disposal System Data

Data provided by DLA headquarters personnel indicates that:

-- During Fiscal Year 1976, 3.4 million disposal line items were processed at a total (excluding overhead) operating cost of $58.3 million or an average line item cost of $17.15.

-- Certain tasks are applicable to each disposal line item processed; these are: (1) property accounting, (2) receiving, and (3) location. In Fiscal Year 1976, the performance of these tasks generated costs of $19.1 million or an average cost of $5.61 per disposal line item. Other tasks, such as utilization screening, effecting materiel transfer and donation, merchandising, preparing property for sale, and conducting sales, generate additional costs which contribute to the overall average of $17.15 per disposal line item. Certain tasks such as "Front End" and "Final Asset" screening and worldwide advertising are applied only to higher value line items and are not applied to lots.

-- The average return rate from sales of usable property in Fiscal Year 1976 was 5.4%.

-- As of 31 January 1977, the Defense Property Disposal Service (DPDS) was able to stratify an inventory of 593,652 line items valued at $366.0 million. The average value of the 322,025 line items under $50 was $22.

4. Impact of Net Disposal Cost

For the purposes of this Study it is necessary to evaluate only the impact of net disposal costs for excess supply line items having a value under $50, because these are the items which will be affected by changes in excess reporting criteria. The newly prescribed disposal regulations now permit line items valued at $50 or less to be consolidated and transferred to disposal as a single lot at a greatly reduced disposal processing cost. A processing cost near the $5.61 minimum is likely to occur for the low value transactions (under $50) and lots (regardless of value) because these disposal line items are subject to the least number of processing tasks beyond the three basic tasks applicable to all line items. The net disposal cost per supply line items valued at $50 or less is very small - and possibly, there may be a small profit. The rationale for this is displayed in Table IV-4.

Table IV-4

NET GAIN OR LOSS ON DISPOSAL OF BATCH LOTS

Number of Supply Line Items per Disposal Lot	Value of Disposal 1/ Lot at $22 per Supply Line Item	Value (to nearest $) of Reutilization and Sale Proceeds at 5.4% of Value 2/	Net Cost or Benefit per Supply Line Item Based on Processing Cost of	
			$7 per Disposal Lot	$10 per Disposal Lot
2	$44	$2	-$2.31	-$3.81
5	110	6	- 0.21	- 0.81
10	220	12	+ 0.48	+ 0.19
15	330	18	+ 0.72	+ 0.52
20	440	24	+ 0.84	+ 0.69

Source: Analysis

1/ $22 is based on the average value of the 329 thousand disposal items under $50 on-hand as of 31 January 1977.

2/ Computed at the Fiscal Year 1976 sales proceeds rate (5.4%). The value of reutilization achieved plus sales proceeds were assumed to be at least equal to the Fiscal Year 1976 sales rate of return of 5.4%.

The data displayed in Table IV-4 indicates that upon implementation of the revised disposal policy to permit lotting of supply line items valued at $50 or less, the net disposal cost per supply line item should be:

Consolidation Achieved	Profit or Loss
2 to 1	$2 to $4 Loss
5 to 1	Less than $1 Loss
10 to 1	Less than $1 Profit
20 to 1	$1 Profit

With an average consolidation rate of 5 to 10 supply line items per disposal lot, the net disposal cost will be nil. Greater consolidation will achieve a slight profit per supply line item while less consolidation will result in a small loss per supply line item.

Observations made during field research indicate that a consolidation rate of 5 to 10 supply line items per disposal lot is feasible, and should be attained. The net disposal gain or loss per supply line item processed under the revised disposal criteria is considered to be so small that it can be excluded in calculating the breakeven point for returning excess materiel in this Study.

E. BREAKEVEN POINT

1. *Basic Approach*

As discussed in the introduction to this Chapter, the basic formula for the breakeven point is:

$$\text{Breakeven Point} = \frac{\text{Cost of Return - Net Cost of Disposal}}{\text{Value per Dollar}}$$

Assuming zero, or a very low (as displayed in Table IV-4) disposal cost for low value supply line items, permits computation of a breakeven point which compares only the cost of returning materiel with the benefit of having the materiel in wholesale inventory. Materiel which is worth less than the cost of the return should not be returned. The breakeven point is that dollar value at which the benefits from the return exactly equal the cost of the return.

Costs and benefits may vary considerably depending on the materiel commodity and the wholesale depot receiving the return. Although it would be possible to compute multiple breakeven points, the available data is not sufficiently precise to warrant this. Consolidated values were computed for materiel returns having a current or near term requirement (within AFAO) and for materiel having a future requirement (beyond AFAO). The values are shown in Table IV-5.

Table IV-5

COMPUTATION OF BREAKEVEN VALUES

Type of Return	Cost of Return	Value Per Dollar	Breakeven Value
Return within AFAO	$12.90	$0.82	$15.73
Return beyond AFAO	12.90	0.45	28.67

Source: Analysis

2. Alternative Approach. An alternative approach to the calculation of a breakeven point for materiel returns considers the cash flows associated with materiel returns to arrive at a line item value below which return is uneconomical. The calculation is a cost equation that determines the return line item value which balances cost to return and hold against the cost to dispose and purchase. The calculation produced breakeven values of $16.11 for return within the AFAO and $32.04 for return beyond the AFAO. The alternative approach is in Appendix D.

F. SENSITIVITY ANALYSIS

1. Introduction. Sensitivity analysis is a technique applied to mathematical and statistical relationships that will reveal the behavior of the relationship when one or more variables are varied over their probable ranges. If the "driving" variables are known in a cost or other relationship, variation is introduced into these independent variables and the effect upon the dependent variable is either plotted or noted in a table.

2. Discussion

Document Processing Costs: This cost is the average dollar cost to process the various documents associated with returned materiel. The average cost is $2 per return line item. This cost is varied from $0 to $4.

Transportation Costs: This is the average cost per line item to transport the low dollar value line items from the activity to the wholesale depot. The parcel post rate of $1.83 (for all items less than 14 pounds) is taken as the average. The average weight of all items is less than seven pounds. This cost is varied from $0 to $3.72. The $3.72 is shipping cost for the next category of parcel post (14 to 27 pounds).

Wholesale Depot Processing Costs: The wholesale depot processing cost is calculated as $9.07 per low dollar value line item. Within the Department of Defense this cost (average by Component) varies from $15.70 to $8.43 and these values are used in the sensitivity analysis.

Inventory Holding Cost Rate: The average inventory holding cost rate for DoD is .22. The range over which this factor varies is from .15 (Marine Corps) to .25 (Army). The lower value is not included in the sensitivity analysis calculation because of the very small value of Marine Corps inventory. Therefore, inventory holding costs are varied from .19 to .25.

Procurement Cost Avoidance per Dollar: This variable uses the DoD average of 1.00. Its range is from .93 to 1.04.

The following table shows each variable and the sensitivity analysis range expressed as a percentage along with the impact on the "breakeven" point for "return within the AFAO" and "return beyond the AFAO."

Table IV-6

VARIABLES SENSITIZED

Factor	Variance	Impact on Breakeven Value Within AFAO	Impact on Breakeven Value Beyond AFAO
Document Processing Cost	+ 100% - 100%	+ 16% - 16%	+ 16% - 16%
Transportation Cost	- 100% + 103%	- 14% + 15%	- 14% + 15%
Depot Processing Cost	+ 73% - 7%	+ 51% - 5%	+ 51% - 5%
Inventory Holding Cost Rate	+ 14% - 14%	No effect No effect	+ 10% - 9%
Procurement Cost Avoidance per Dollar	+ 4% - 7%	- 4% + 8%	- 4% + 8%

Source: Analysis

Using the range of values shown above and taking variables to their extreme in either direction, the maximum ranges in either direction are calculated.

Return within AFAO =	High Value -	$31.48	+ 100%
	Breakeven -	$15.73	
	Low Value -	$9.65	- 39%
Return beyond AFAO =	High Value -	$61.90	+ 116%
	Breakeven -	$28.67	
	Low Value -	$16.55	- 42%

These ranges have significance in that they give relative measure to the possibility of change and show in which direction change most likely will occur.

3. Summary

The "Breakeven Point" for returns within the AFAO most certainly lies between $31.48 and $9.65, and between $61.90 and $16.55 for returns beyond the AFAO. These values were computed with all variables set at the extreme limits of their ranges.

If the variables are held to a subjective "most likely range": the Inventory Holding Cost Rate held constant at .22, the Procurement Cost Avoidance per Dollar held constant at $1.00, the Document Processing Cost varying from $2 to 0, the Transportation Cost remaining constant at $1.83 per line item, and the Depot Processing Cost varying upward to $11.60 (DoD average weighted by total dollar returns); the range of breakeven values is from $13.29 to $18.82 (-16% to +20%) for returns within the AFAO, and from $24.22 to $34.29 (-16% to +20%).

A significant conclusion to be drawn from this sensitivity analysis is that for either category of return the breakeven point is more sensitive upward than downward.

G. PRACTICAL RETURN AND REPORTING CRITERIA

1. General. Table IV-5 demonstrates that if an activity's excess has an invoice value of at least $15.73, and there is a requirement within the AFAO, then it is cost effective to return the excess. The only way to determine if a wholesale system requirement exists is to report the excess for a materiel management decision. If there is a requirement within the AFAO, the reporting criterion also provides the basis for a return decision. If there is a requirement beyond the AFAO, but within the retention limit, the return decision should be based on the $28.67 breakeven value.

2. Return Limits

The $15.73 and $28.67 breakeven values computed for returns required within the AFAO and those required beyond the AFAO were based primarily on Fiscal Year 1976 "average" cost and benefit data. A sensitivity analysis was conducted to show the impact of a change of possible values in the data base. This analysis demonstrated that the computed breakeven values should not be viewed as precise and that the computed values are more sensitive upward than downward. Further, breakeven points for use in a DoD policy directive will be more practical if expressed in whole dollars.

In view of continuous inflationary trends and the relatively greater upward sensitivity demonstrated for the computed breakeven values, it is reasonable to establish return limits higher than the precisely computed breakeven values. Therefore, the return limit criteria proposed for publication in a DoD policy directive are:

Returns within the AFAO	$20
Returns beyond the AFAO	$35

3. Reporting Limits

Excess retail materiel can be classified into two distinct categories: "Total" excess and "Partial" excess. Materiel is totally excess when the activity will no longer stock the item. It is partially excess when there are continuing requirements, but the on-hand quantity is greater than authorized levels plus a minimum of two and a maximum of three years demand.

Current minimum reporting limits are $10 per line for total excess and $50 per line for partial excess. The rationale for the higher limit for partial excess is to avoid uneconomical return or disposal of small amounts of excess materiel that can be eliminated by attrition in place. As long as the cost to hold the partial excess is less than the cost of return (or disposal) and subsequent resupply, then the materiel should be held in lieu of reporting.

Total excess, however, cannot be removed through attrition and should either be returned to wholesale inventory or transferred to disposal. Since visibility is necessary in order to determine if the excess is required by the inventory manager, the reporting limit for total excess should coincide with the minimum return level, i.e., $20. Materiel valued at less than the return level should be transferred directly to disposal without reporting.

The existing $50 reporting limit for partial excess is higher than the breakeven point for returning materiel. However, because (1) "retention" is relatively less costly than the "return" of materiel and (2) partial dispositions of activity excess have potentially greater costs than total disposition, partial dispositions should be discouraged and the criterion for reporting "partial excesses" should be retained at $50.

4. Impact of Revised Criteria

The breakeven value equation identifies the minimum dollar value at which it is cost effective to return excess retail materiel having a wholesale system requirement. Excess materiel valued at less than this amount should be transferred to disposal because the expected benefit of having the materiel in inventory is less than the cost of the return.

Appendix B, Tables B-4 and B-5 display the number and value of materiel authorized for return with and without credit. Returns with credit are normally to fill requirements within the AFAO while returns without credit are normally to fill requirements beyond the AFAO. Therefore, the approximate number and gross dollar value of returns eliminated by the revised criteria would be as follows:

	Number of Returns	Invoice Value (millions)
Returns within AFAO (Valued less than $20)	97,000	$1.4
Returns beyond AFAO (Valued less than $35)	193,400	3.8
Total Returns Avoided	290,400	$5.2

H. CREDIT RETURNS POLICY AND PRACTICES

1. Background

With the advent of revolving (stock) funds within the Federal Government, including DoD, came the development of policies and practices whereby credit would be granted for the return of materiel from a consumer fund to a stock fund or from one stock fund to another. A primary reason for granting such "credit" is to encourage the return of materiel when an excess exists at one location and a requirement for the materiel is recognized by the organization granting credit. A common flow of materiel for credit is from the consumer and retail level to the wholesale level.

As stated by this Study assignment, credit return policies and practices vary. On one hand, DoD grants credit at 100% of the standard, purchase, or discount price for ready for issue (RFI) materiel returned to fill a requirement within the AFAO and no credit when RFI materiel is returned to fill a requirement beyond the AFAO; returns with and without credit are encouraged and accepted. On the other hand, GSA grants credit at 80% of the standard price for RFI materiel returned to fill a requirement within the requisitioning objective; materiel returns without credit are not authorized. For "economically repairable" materiel GSA has a standard credit rate of 30%, while DoD activities have rates varying from about 20% to 65%. The variable rates applied by GSA and DoD to economically repairable materiel are based on the estimated cost of restoring the materiel to an RFI condition.

2. Application of Credit Based on Value of Materiel

In making the delimiting decisions prescribed by this Chapter — that is, ascertaining (1) when to report excess materiel and (2) when to return materiel — the decision to grant or not grant credit or the amount of credit has not been a factor. However, in developing the breakeven approach (as delineated in this Chapter and in Appendix D) a dominant factor applied is that excess materiel to be returned must have value to the government and that its present value declines with time; that is, materiel required to meet an immediate requirement is valued at or near 100% and the value of materiel required at or near the retention limit is nil. This is displayed graphically by line V-V' in Figure IV-1, where a six year retention limit is assumed.

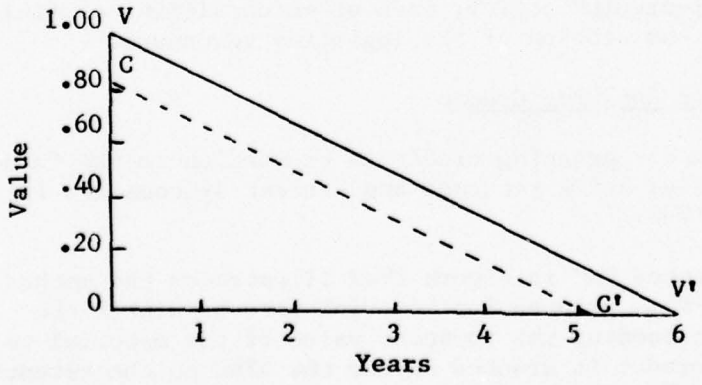


Figure IV-1

The rationale for establishing reporting and return limits for excess retail materiel also can provide rationale for applying a rate of credit for returns; i.e., credit granted can be proportional to the value of the materiel returned. Since there are costs associated with materiel return and, except for filling backorders, there is risk involved (i.e., materiel may be returned and demand may not materialize), credit should be granted at a rate less than the projected future value of the return. Another reason for granting credit at a rate lower than the total value of the materiel is that the logistics system is not designed to foster returns and should not provide 100% credit for "return of excess" under any circumstance. Line C to C' in Figure IV-1 illustrates a credit rate which is consistently less than the materiel value and consistently applied from 80% of value to $\emptyset$.

Institution of a credit return policy directly related to the declining materiel worth and inversely related to the risk would meet the following objectives:

** Apply credit in accordance with the value of the returned materiel.

** Discourage wholesale managers from authorizing materiel returns which are not cost effective.

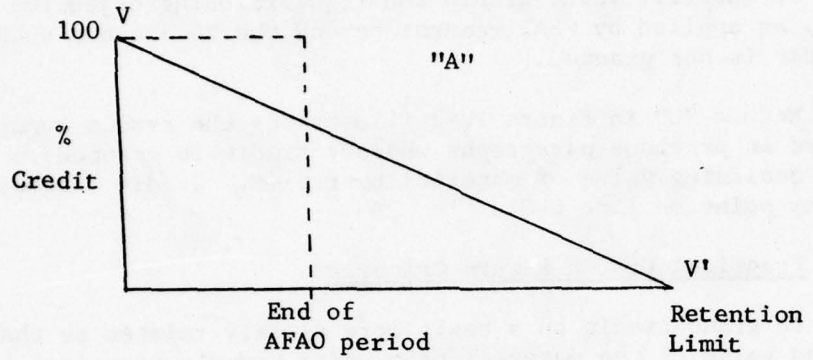
** Encourage activities/organizations to return materiel when authorized by the wholesale manager.

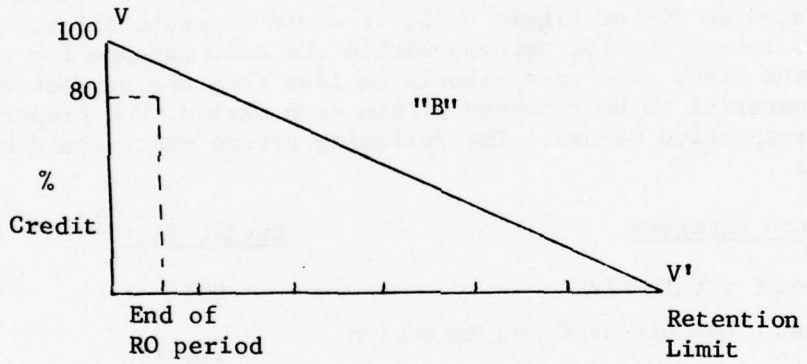
In addition, adoption of credit rates based on materiel value provides a reasonable compromise between two extremes; a "no-credit" policy and a "full-credit" policy, each of which eliminates financial incentive at one echelon of the logistics structure.

3. Methods for Applying Credit

The system for granting credit in proportion to the forecast value of the materiel being returned and current systems are illustrated in Figure IV-2.

Current method "A" in Figure IV-2 illustrates the method wherein 100% credit is granted for materiel returns within the AFAO — actually exceeding the forecast value of the materiel to be returned. No credit is granted beyond the AFAO to the retention limit in spite of the projected value of the materiel returns.


100
V
"A"
%
Credit
V'
End of
AFAO period
Retention
Limit


100
V
80
"B"
%
Credit
V'
End of
RO period
Retention
Limit

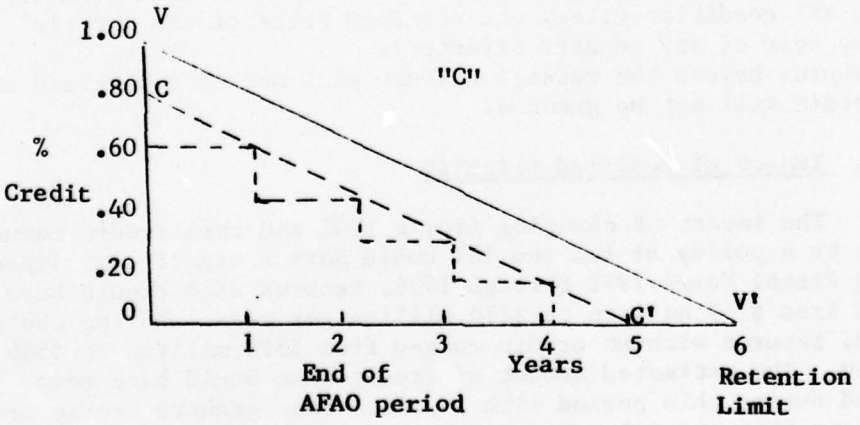

1.00
V
.80
C
"C"
%
.60
Credit
.40
.20
0
C'
V'
1
2
3
4
5
6
Years
End of
AFAO period
Retention
Limit

Figure IV-2

Current method "B" in Figure IV-2 illustrates credit closely related to materiel value within the requisitioning objective (RO); however, as applied by GSA, returns beyond the RO are not authorized and credit is not granted.

Method "C" in Figure IV-2 illustrates the credit concept described in previous paragraphs whereby credit is granted in relation to declining value of materiel over time. Credit factors can be at any point on line C-C'.

4. Practical Credit Return Criteria

To grant credit on a basis more closely related to the projected value of the materiel than under today's practices but without applying credit on a totally sliding scale as illustrated by line C to C' of Figure IV-1 or to a broad range of points as illustrated in "C" of Figure IV-2, it would be practical to apply only two rates, one for returns within the AFAO and one for returns beyond the AFAO. The rates should be less than the projected values of the materiel to be returned within each period, but proportional to the respective values. The following return rates could be applied:

Return Category	Credit Rate 1/
Requirement within AFAO	60%
Requirement between AFAO and Retention Limit	15% 2/

1/ Rates displayed would be applied to the value of the materiel in RFI condition (i.e., the standard price of the materiel less the cost of any repairs effected).

2/ Returns beyond the retention limit will not be authorized and credit will not be granted.

5. Impact of Modified Criteria

The impact of changing from a 100% and zero credit return policy to a policy of 60% and 15% could have a significant impact. During Fiscal Years 1972 through 1976, returns with credit have ranged from $153 million to $210 million per year. During the same period, returns without credit ranged from $378 million to $540 million. The estimated amount of credit that would have been granted during this period with a policy that granted credit proportional to the materiel value is shown in Table IV-7.

Table IV-7

ESTIMATED COST OF PROPORTIONAL CREDIT POLICY[1/]
($ in millions)

Fiscal Year	Within AFAO at 60%	AFAO to RL at 15% [2/]	Total Credit
1972	$126.2	$80.9	$207.1
1973	105.2	60.5	165.7
1974	101.0	51.2	152.2
1975	91.8	56.7	148.5
1976	125.7	75.9	201.6

Source: October 1974 Report on Materiel Returns and Table B-1 with Analysis

1/ Estimate excludes petroleum and subsistence.
2/ Credit granted at 15% is overstated because not all materiel currently returned without credit would qualify for return.

The results displayed in Table IV-7 show an annual range from about $149 million to $207 million, slightly less than the amount of credit actually granted under present credit policy. Table IV-8 displays the impact by fiscal year that such a policy change would have had on the amount of credit granted.

Table IV-8

IMPACT OF CREDIT POLICY CHANGE[1/]
($ in millions)

Fiscal Year	Credit Granted Present Method	Credit Granted Proportional Method [2/]	Change
1972	$210.4	$207.1	-$3.3
1973	175.4	165.7	- 9.7
1974	168.4	152.2	-16.2
1975	153.0	148.5	- 4.5
1976	209.5	201.6	- 7.9

Source: October 1976 Report on Materiel Returns and Table B-1 with Analysis

1/ Excludes petroleum and subsistence.
2/ Credit granted under proportional method is overstated because not all materiel now returned without credit would qualify for return.

The results displayed show a total program change of about $3 million to $16 million less credit per year being granted over the past five years. Changing credit factor(s) could cause the amount of credit granted to equal or exceed that actually granted for each year; hence, the financial impact of a system modification whereby credit is proportional to the value of materiel returned can be influenced easily by manipulating the credit factors.

I. KEY OBSERVATIONS AND CONCLUSIONS

The review and analysis of cost and benefit data related to retail excess for DoD-managed materiel indicates that:

1. Aggressively consolidating low value (under $50) excess supply line items into single disposal lots will decrease the net cost of disposal to a negligible amount.

2. Assuming the net cost of disposal for low value excess supply line items will be negligible, minimum reporting and return limits for excess retail materiel can be based on a breakeven analysis which compares the cost of return to the value per dollar of materiel returned.

3. Separate breakeven values are applicable for excess materiel with a requirement within the AFAO and for materiel required beyond the AFAO. Breakeven values for returning excess retail materiel, based primarily on Fiscal Year 1976 data are:

Returns required within AFAO	$15.73
Returns required beyond AFAO	$28.67

4. Sensitivity analyses of the breakeven values computed for materiel returned for use within the AFAO and for use beyond the AFAO indicate that for either category of return the breakeven point is more sensitive upward than downward. Sensitivity analyses, allowance for inflation, and practicality of whole dollar criteria indicate that minimum return limits should be as follows:

Returns required within AFAO	$20
Returns required beyond AFAO	$35

5. The minimum reporting limits should coincide with the lowest minimum return limit, i.e., $20, for totally excess retail materiel. The reporting limit for partially excess retail materiel should avoid uneconomical return or disposal of small amounts of materiel when attrition in place is possible. Reporting limits should be:

Total Excess	$20
Partial Excess	$50

6. Minimum reporting and return limits should be periodically adjusted to reflect inflation or recomputed on a cyclic basis to take into account changing costs. The breakeven equation presented herein is appropriate for use in recomputing limits using updated cost factors.

7. Allocation of credit in accordance with the value of materiel returned provides incentive for judicious financial management at the wholesale manager and retail levels, is consistent with the findings of the Study, and can be accomplished with minimal financial impact.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

(EXECUTIVE BRIEF)

A. INTRODUCTION

By a memorandum of 29 November 1976 the Defense Logistics Analysis Office (DLAO) was requested to conduct, jointly with the General Services Administration (GSA), a review and analysis of policy, criteria, and processes for excess materiel reporting and returns determination. The attached Study Plan listed the following specific objectives:

"a. Ascertain how DoD and GSA materiel returns are processed;

"b. Determine the cost of effecting materiel returns;

"c. Evaluate the cost versus the value of returning materiel to store; and

"d. Recommend criteria for making credit return decisions and submit the criteria to the DoD and GSA for consideration."

B. POLICIES AND PROCEDURES

The review of the Department of Defense (DoD) and GSA policies and procedures used for reporting excesses and effecting materiel returns decisions indicates that:

1. Materiel returns policies, procedures, and practices vary significantly between DoD and GSA.

2. DoD materiel return policy is interpreted and implemented through varying procedures and practices by the DoD Components.

3. The different policies, procedures, and practices directly and indirectly effecting materiel returns can be expected to yield varying results within the materiel returns programs.

4. Implementation of standard DoD/GSA Materiel Returns Program procedures within the Military Standard Requisitioning and Issue Procedures (MILSTRIP) should be expedited as one step toward more consistent materiel returns program results.

PRECEDING PAGE NOT FILMED
BLANK

C. PROGRAM PERSPECTIVE

The review and analysis of the respective GSA and DoD materiel returns programs indicate that:

1. The materiel returns program for GSA-managed materiel is very small; less than 1% of the materiel returns program for DoD-managed materiel.

2. From a GSA perspective its credit returns program shows a loss, but from a Federal Government viewpoint the materiel placed in store has value greater than GSA program costs.

3. The change in GSA policy whereby returns are authorized only to satisfy deficiencies within the requisitioning objective has had a significant impact on the decreasing value of GSA materiel returns.

4. Modifying the Federal Property Management Regulations (FPMR) criteria for reporting excess GSA-managed materiel to GSA from the present $25, $50, and $300 criteria to the $50, $100, and $300 criteria recommended by GSA will not have a significant financial impact on any DoD activity, a single DoD Component, or DoD as a whole.

5. Absolute values within the DoD materiel returns program are so large (e.g., $2 million to $4.3 million in the under $25 per line item category) that modifying the DoD criteria for reporting excess DoD-managed materiel to DoD materiel managers from the present $10 criterion could have a significant impact on the reporting activity, the inventory manager, and the wholesale depot.

6. Having separate, different excess materiel reporting and return criteria for GSA-managed and DoD-managed materiel is rational as long as materiel management policies and practices which influence materiel return costs are nonstandard.

D. CRITERIA FOR REPORTING ACTIVITY EXCESS, MAKING MATERIEL RETURN DECISIONS AND GRANTING CREDIT

1. DoD-Managed Materiel

Because of the high value of DoD-managed materiel reported excess and having potential return value, an extensive analysis was made to determine the breakeven point where:

$$\text{Value of Returned Materiel} = \frac{\text{Cost of Return}}{\text{Value per Dollar}}$$

The analysis considered:

Value of Potential Materiel Return:

- Avoidance of Purchase Costs
- Cost of Capital
- Inventory Holding Costs
- Present Value

Cost of Return:

- Document Processing Costs
- Transportation Costs
- Wholesale Depot Costs

Net Cost of Disposal:

- Disposal Processing Costs
- Potential Value of Returns from Disposal

The review and analysis of cost and benefit data related to retail excess for DoD-managed materiel indicates that:

a. Aggressively consolidating low value (under $50) excess supply line items into single disposal lots will decrease the net cost of disposal to a negligible amount.

b. Assuming the net cost of disposal for low value excess supply line items will be negligible, minimum reporting and return limits for excess retail materiel can be based on a breakeven analysis which compares the cost of return to the value per dollar of materiel returned.

c. Separate breakeven values are applicable for excess materiel with a requirement within the Approved Forces Acquisition Objective (AFAO) and for materiel required beyond the AFAO. Breakeven values for returning excess retail materiel, based primarily on Fiscal Year 1976 data are:

Returns required within AFAO	$15.73
Returns required beyond AFAO	$28.67

d. Sensitivity analyses of the breakeven values computed for materiel returned for use within the AFAO and for use beyond the AFAO indicate that for either category of return the breakeven point is more sensitive upward than downward. Sensitivity analyses, allowance for inflation, and practicality of whole dollar criteria indicate that minimum return limits should be as follows:

Returns required within AFAO	$20
Returns required beyond AFAO	$35

f. Minimum reporting and return limits should be periodically adjusted to reflect inflation or recomputed on a cyclic basis to take into account changing costs. The breakeven equation presented herein is appropriate for use in recomputing limits using updated cost factors.

g. Allocation of credit in accordance with the value of materiel returned provides incentive for judicious financial management at the wholesale manager and retail levels, is consistent with the findings of the Study, and can be accomplished with minimal financial impact.

2. GSA-Managed Materiel. Application of readily available GSA data to the breakeven formula indicates that GSA-managed materiel would have a breakeven point between $78 and $194. However, data is not available to sensitize the GSA cost factors and as indicated in Chapter III, "Program Perspective," the magnitude of the GSA returns program does not justify collection of additional data either across the board or by the three GSA return categories. Therefore, it is concluded that for GSA-managed materiel:

a. The GSA proposed criteria are acceptable.

b. In making future recommendations for changing the return criteria in the FPMR, GSA should use the breakeven analysis approach, applying data from the GSA cost accounting system.

c. Application of a breakeven approach by GSA would indicate that materiel returns beyond the requisitioning objective (RO) to an economic retention limit are of value. Acceptance of returns beyond the RO to an economic retention limit would require a GSA policy change.

E. RECOMMENDATIONS

In view of the foregoing findings, analyses, and conclusions, it is recommended that:

THE ASSISTANT SECRETARY OF DEFENSE (MANPOWER, RESERVE AFFAIRS, AND LOGISTICS):

1. CONCUR WITH THE PROPOSAL FROM THE COMMISSIONER, FEDERAL SUPPLY SERVICE (FSS), GENERAL SERVICES ADMINISTRATION (GSA) TO AMEND THE FEDERAL PROPERTY MANAGEMENT REGULATIONS (FPMR) TO INCREASE THE DOLLAR VALUE CRITERIA FOR REPORTING MATERIEL EXCESSES TO GSA FOR POSSIBLE RETURN OF THE MATERIEL.

2. RECOMMEND TO THE COMMISSIONER, FSS, GSA, THAT:

   a. FUTURE PROPOSALS TO CHANGE THE FPMR CRITERIA FOR REPORTING AND RETURNING EXCESS MATERIEL BE BASED ON THE APPLICATION OF A BREAKEVEN ANALYSIS (AS SET FORTH IN CHAPTER IV OF THIS REPORT); AND

   b. GSA CONSIDER ACCEPTING RETURNS BEYOND THE REQUISITIONING OBJECTIVE TO AN ECONOMIC RETENTION LIMIT.

3. EXPEDITE THE IMPLEMENTATION OF THE STANDARD MATERIEL RETURNS PROGRAM (MRP) PROCEDURES DISTRIBUTED AS AN ENCLOSURE TO "APPROVED MILSTRIP CHANGE LETTER 03" OF 9 AUGUST 1976.

4. CHANGE DOD DIRECTIVE 4100.37, RETENTION AND TRANSFER OF MATERIEL ASSETS, 7 JUNE 1974, AS FOLLOWS:

   a. PARAGRAPH VI-A-1

      WHEN THE TOTAL LINE ITEM ON-HAND QUANTITY IS DETERMINED TO BE EXCESS (TOTAL EXCESS) TO THE NEEDS OF AN ACTIVITY, AND IS VALUED AT $20 OR LESS, THE STOCK WILL BE PROCESSED FOR DISPOSAL WITHOUT REPORTING TO THE COGNIZANT WHOLESALE MANAGER FOR DISPOSITION INSTRUCTIONS.

   b. ADD NEW PARAGRAPH VI-B

      "B. WHEN A RETAIL EXCESS QUANTITY VALUED AT $35 OR LESS IS REPORTED TO THE WHOLESALE MANAGER AND THE WHOLESALE MANAGER DOES NOT HAVE A REQUIREMENT WITHIN THE AFAO, THE WHOLESALE MANAGER SHALL AUTHORIZE THE HOLDING ACTIVITY TO INITIATE DISPOSAL ACTION."

   c. RENUMBER PARAGRAPH VI-B TO VI-C.

5. DIRECT THE DIRECTOR, DEFENSE LOGISTICS AGENCY TO CONDUCT AT LEAST EVERY THREE YEARS, A BREAKEVEN ANALYSIS, AS DESCRIBED IN CHAPTER IV OF THIS REPORT, TO DETERMINE WHETHER THE CRITERIA FOR REPORTING AND RETURNING EXCESS MATERIEL SHOULD BE MODIFIED AND, WHEN THE NEED IS DEMONSTRATED BY THESE ANALYSES, RECOMMEND MODIFIED CRITERIA TO THE ASD(MRA&L).

APPENDIX A

ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301

SR

INSTALLATIONS AND LOGISTICS

29 November 1976

MEMORANDUM FOR THE ASSISTANT SECRETARY OF THE ARMY (I&L)
ASSISTANT SECRETARY OF THE NAVY (I&L)
ASSISTANT SECRETARY OF THE AIR FORCE (I&L)
DIRECTOR, DEFENSE SUPPLY AGENCY

SUBJECT: Criteria for Return of Materiel for Credit

Since November 1975, the General Services Administration (GSA), Federal Supply Service has been advocating amendment of the Federal Property Management Regulations (FPMR) to increase the dollar value criteria for reporting materiel excesses to GSA for possible return of the materiel for credit. The Departments of the Army and Navy have submitted objections to the increased reporting criteria and GSA has withheld distribution of the FPMR amendment.

The Defense Supply Agency (DSA) and GSA have pointed out that the DoD and GSA policies for reporting excess materiel to a materiel manager for a "return" or "dispose" decision vary. Both Agencies have recommended a study to resolve the issues raised.

This Office concurs that the issues should be resolved and that more consistent criteria for reporting excess materiel are desirable. The enclosed Study Plan sets forth the objectives of a review and analysis of policy, criteria, and processes for excess materiel reporting and returns determination and outlines an approach toward development of policy and criteria for reporting excess materiel.

The Director, Defense Supply Agency is requested to direct the Defense Logistics Analysis Office (DLAO) to conduct the review and analysis jointly with GSA in accordance with the attached Study Plan.

PRECEDING PAGE NOT FILMED
BLANK

All addressees have an interest in the accomplishment of this assignment. Therefore, your special attention is directed to paragraphs F through I of the Study Plan which establish a need for Military Service, DSA, and GSA contact points, headquarters level briefings, and, ultimately, on-site research and data collection.

/s/ Paul H Riley
/t/ PAUL H. RILEY
Deputy Assistant Secretary of Defense
(Supply, Maintenance & Services)

Enclosure
As Stated

cc: Commissioner, Federal Supply Service
General Services Administration

STUDY PLAN
for
AN EVALUATION OF DoD/GSA
CREDIT RETURN POLICY

A. PURPOSE

The intent of this Study is to resolve differences between Department of Defense (DoD) and General Services Administration (GSA) credit return programs and develop rationale for establishing a consistent, practical credit return policy.

B. BACKGROUND

In November 1975 the GSA Federal Supply Service proposed a change to the Federal Property Management Regulations (FPMRs) which would (1) raise the minimum dollar values required for items to be eligible for return to GSA for credit, and (2) provide policy on the granting of credit for materiel returned with packing or packaging deficiencies. The minimum dollar values proposed were: $50 (vice $25) for hand tools, Federal Supply Group (FSG 51) and measuring tools (FSG 52); and $100 (vice $50) for items in certain other FSGs and Federal Supply Classes (FSCs).

During the DoD review of the proposed FPMR change, two Military Departments protested the increased minimums required for return of materiel to GSA for credit. The Department of the Army professed that the change "would permit more materiel...to be automatically referred to disposal or unnecessarily retained by field commands." The Department of the Navy stated that credit returns, approximating $700 thousand in Fiscal Year 1975, "could be reduced by one-half" and "cause the use of NSF cash to finance the requirements historically paid for with credit billings." Each of these Departments protested and pointed out that DoD Directive 4100.37, "Retention and Transfer of Materiel Assets" authorizes returns of materiel for credit with a minimum line item value of only $10. Each indicated that DoD and GSA policy regarding materiel returns with credit should be more consistent and suggested a study of the situation.

Subsequent to the DoD review of the proposed FPMR change, GSA informed DSA that the new "minimums were developed as a result of a thorough analysis of the costs involved in returning items to stock." However, GSA deferred publication of the changes and suggested a joint DSA/GSA study aimed at (a) "identification of all cost factors relating to the return of items to inventory" and (b) "development of credit return procedures which reflect the maximum practical degree of uniformity."

By a Memorandum dated August 24, 1976, subject: "Proposed Revision to the Federal Property Management Regulations (FPMRs)", DSA forwarded the GSA suggestion for a study to the Deputy Assistant Secretary of Defense (Supply, Maintenance and Services) and proposed that such a study, if undertaken, would be an appropriate task for the Defense Logistics Analysis Office (DLAO).

C. OBJECTIVES

Within the overall purpose of this assignment, the study team shall:

1. Ascertain how DoD and GSA materiel returns are processed;

2. Determine the cost of effecting materiel returns;

3. Evaluate the cost versus the value of returning materiel to store; and

4. Recommend criteria for making credit return decisions and submit the criteria to the DoD and GSA for consideration.

D. SCOPE

This study encompasses all stock fund materiel determined to be excess by an owning activity or Component and involves the decision criteria for determining whether the excess materiel shall be reported to the materiel manager (GSA, a Military Service or DSA) or automatically transferred to disposal.

Policies, criteria, and practices, and related costs, for reporting excess materiel, making return determinations, and returning materiel are subject to this review and analyses.

E. TEAM COMPOSITION AND ADMINISTRATION

The Study Team will be composed of three full-time members of the Defense Logistics Analysis Office Staff including a Team Director, plus an augmentee from GSA who is familiar with materiel returns policies and practices.

The Study Team will receive administrative support from the DLAO and DSA Administrative Support Center in accordance with ongoing arrangements. TDY expenses will be provided by the home office of each individual team member.

F. CONTACT POINTS

Each Military Service and DSA will designate an individual to serve as point of contact with the Study Team. This individual will be

responsible for providing, or arranging for required data and briefings, and for furnishing assistance in arranging visits as necessary. The name, organization and telephone number of contact points will be furnished to the Defense Logistics Analysis Office within fifteen days of the date of the memorandum approving this Study Plan. Notification to the DLAO may be by telephone at 274-6283 (Autovon 284-6283).

The DoD Project Officer for this assignment is Mr. John G. Marcus, OASD(I&L), 697-9196 (Autovon 227-9196).

G. STUDY APPROACH

The Study Team will:

1. Review existing DoD and GSA publications, reports, studies and Issuances pertaining to the policies and practices for reporting excesses and processing materiel returns.

2. Obtain briefings from the Military Services, DSA and GSA regarding the nature and coverage of their programs for reporting excesses and processing materiel returns.

3. Identify through on-site field research at a representative range of logistics and user activities of the Military Services and DSA:

a. Criteria used to identify when items qualify for excess reporting, disposal and/or return for credit;

b. The volume of items reported and materiel returned; and

c. The cost of reporting excess items, transferring items to disposal or to the item manager's inventory, and processing credit returns.

4. Evaluate the relative cost of (a) reporting excess materiel to a materiel manager vice automatic disposal, and (b) effecting materiel returns vice the value of such returns.

5. Recommend to the DoD and GSA standard policy and criteria for identifying:

a. When to transfer excess materiel, automatically, to disposal;

b. When to report excess materiel to the materiel manager for a materiel return determination.

APPENDIX B

STATISTICAL DATA

The statistical data set forth in this Appendix supports related tables and narrative appearing in Chapters I through V of the Report. The Appendix's contents are:

Table B-1 - Wholesale Stock Fund Sales and Returns

Table B-2 - Materiel Authorized for Return by Dollar Strata, August to December 1976, Dollars

Table B-3 - Materiel Authorized for Return by Dollar Strata, August to December 1976, Documents

Table B-4 - Materiel Returns Authorized by Dollar Strata Adjusted to Annual Basis

Table B-5 - Materiel Authorized for Return Adjusted to Annual Basis

Table B-6 - GSA Classification of Materiel Returns (Value)

Table B-7 - GSA Classification of Materiel Returns (Line Items)

Table B-8 - Wholesale Distribution Depots Cost per Line Item Received

Table B-9 - Inventory Manager Inventory Characteristics Stock Fund Materiel

Table B-10 - Value per Dollar of Returned Materiel

PRECEDING PAGE NOT FILMED

Table B-1

WHOLESALE STOCK FUND SALES AND RETURNS
($ Millions)

DoD Components and GSA	FY 1975	FY 1976	FY 7T
ARMY:			
Sales	$705.8	$844.8	$227.8
Returns with Credit	48.4	57.5	20.4
Returns without Credit	178.0	205.7	43.7
Total Army Returns	$226.4	$263.2	$64.1
NAVY:			
Sales	$368.4	$501.9	$119.9
Returns with Credit	18.0	45.3	11.3
Returns without Credit	66.2	133.0	57.1
Total Navy Returns	$84.2	$178.3	$68.4
AIR FORCE: 1/			
Sales	$580.3	$713.7	$183.6
Returns with Credit	31.5	32.0	7.1
Returns without Credit	48.5	52.8	14.9
Total Air Force Returns	$80.0	$84.8	$22.0
MARINE CORPS:			
Sales	$16.2	$18.3	$2.6
Returns with Credit	0.4	0.4	N/A
Returns without Credit	11.3	3.0	N/A
Total Marine Corps Returns	$11.7	$3.4	N/A
DEFENSE LOGISTICS AGENCY: 2/			
Sales	$1,756.6	$1,989.8	$686.5
Returns with Credit	54.7	74.3	20.2
Returns without Credit	73.8	111.3	21.3
Total DLA Returns	$128.5	$185.6	$41.5
GSA:			
Sales to DoD (Stores Items)	$540.0	$485.0	N/A
Returns with Credit	4.8	3.7	0.7

Source: Data Submissions

1/ Air Force includes transfers to Air Force Bases and returns from Air Force Bases.

2/ DLA excludes bulk petroleum and subsistence.

Table B-2

MATERIEL AUTHORIZED FOR RETURN BY DOLLAR STRATA
August to December 1976
DOLLARS

Dollar Range	Credit	Noncredit	Total
0 - 10	$47,726	$43,758	$91,484
11 - 15	249,727	279,953	529,680
16 - 20	270,622	308,044	578,666
21 - 25	282,274	317,214	599,488
26 - 30	286,528	328,980	615,508
31 - 35	295,923	323,796	619,719
36 - 40	292,455	321,787	614,242
41 - 45	296,539	333,783	630,322
46 - 50	325,690	361,105	686,795
51 - 75	2,097,553	2,033,859	4,131,412
76 - 100	1,893,436	1,954,561	3,847,997
101 - 300	11,608,362	13,577,458	25,185,820
Over 300	96,256,343	302,240,459	398,496,802

Source: DAAS Service Report #512 of 3 March 1977

NOTE: Excludes Medical (S9M) Responses due to a problem with reports of excess to S9M from U.S. Army Medicine Materiel Agency. S9M received approximately $8 million in returns annually.

Table B-3

MATERIEL AUTHORIZED FOR RETURN BY DOLLAR STRATA
August to December 1976
DOCUMENTS

Dollar Range	Credit	Noncredit	Total
0 - 10	5,985	6,267	12,252
11 - 15	19,342	21,725	41,067
16 - 20	15,114	17,199	32,313
21 - 25	12,311	13,828	26,139
26 - 30	10,262	11,766	22,028
31 - 35	8,979	9,836	18,815
36 - 40	7,707	8,474	16,181
41 - 45	6,906	7,760	14,666
46 - 50	6,767	7,510	14,277
51 - 75	33,874	32,827	66,701
76 - 100	21,676	22,364	44,040
101 - 300	66,223	75,914	142,137
Over 300	58,045	100,299	158,344

Source: DAAS Service Report $512 of 3 March 1977

NOTE: Excludes Medical (S9M) Responses due to a problem with reports of excess to S9M from U.S. Army Medicine Materiel Agency.

Table B-4

MATERIEL RETURNS AUTHORIZED BY DOLLAR STRATA
ADJUSTED TO ANNUAL BASIS
(Dollars in Thousands)

Dollar Strata	Cumulative Credit Returns	%	Cumulative Noncredit Returns	%	Cumulative Total Returns	%
0-10	$114.5	0	$105.1	0	$219.6	0
11-15	713.8	0.3	777.1	0.1	1,490.9	0.1
16-20	1,364.6	0.5	1,516.3	0.2	2,880.9	0.3
21-25	2,040.7	0.7	2,277.6	0.3	4,318.3	0.4
26-30	2,728.3	1.0	3,067.2	0.4	5,795.5	0.6
31-35	3,438.5	1.3	3,844.3	0.5	7,282.8	0.7
36-40	4,140.5	1.5	4,616.6	0.6	8,757.1	0.8
41-45	4,852.1	1.8	5,417.8	0.7	10,269.9	1.0
46-50	5,633.8	2.1	6,284.4	0.8	11,918.2	1.1
51-75	10,668.0	3.9	11,165.8	1.4	21,833.8	2.1
76-100	15,212.2	5.6	15,856.8	2.0	31,069.0	3.0
101-300	43,072.3	15.7	48,442.8	6.3	91,515.1	8.7
Over 300	274,087.4	100.0	773,820.0	100.0	1,047,907.4	100.0

Source: Computed from Table B-2

NOTE: Excludes Medical (S9M) responses due to data problem with reports of excess to S9M.

Table B-5

MATERIEL AUTHORIZED FOR RETURN
ADJUSTED TO ANNUAL BASIS
(Documents in Thousands)

Dollar Strata	Cumulative Credit Returns	%	Cumulative Noncredit Returns	%	Cumulative Total Returns	%
0-10	14.4	2.2	15.1	1.9	29.5	2.0
11-15	60.7	9.3	67.2	8.3	127.9	8.8
16-20	97.0	14.8	108.5	13.5	205.5	14.1
21-25	126.5	19.3	141.6	17.6	268.1	18.3
26-30	151.2	23.1	170.0	21.1	321.2	22.0
31-35	172.8	26.4	193.4	24.0	366.2	25.1
36-40	191.3	29.2	213.8	26.5	405.1	27.7
41-45	207.8	31.7	232.6	28.9	440.4	30.1
46-50	224.2	34.2	250.6	31.1	474.8	32.5
51-75	305.5	46.6	329.3	40.9	634.8	43.4
76-100	357.6	54.5	383.0	47.5	740.6	50.7
101-300	516.5	78.8	565.2	70.1	1,081.7	74.0
Over 300	655.7	100.0	805.9	100.0	1,461.6	100.0

Source: Computed from Table B-3

NOTE: Excludes Medical (S9M) responses due to data problem with reports of excess to S9M.

Table B-6

GSA CLASSIFICATION OF MATERIEL RETURNS
(Value)

Classification	FY 1974		FY 1975		FY 1976	
	Value	%	Value	%	Value	%
Cond Code A	$4,350,020	63.4	$3,679,321	67.0	$2,788,129	61.6
Cond Codes F & G	1,464,783	21.4	1,124,160	20.5	938,184	20.8
Disposal	1,039,853	15.2	687,156	12.5	794,823	17.6
Total Value Rec'd	$6,854,656	100.0	$5,490,637	100.0	$4,521,136	100.0

Source: GSA Headquarters Briefing

Table B-7

GSA CLASSIFICATION OF MATERIEL RETURNS
(Line Items)

Classification	FY 1974		FY 1975		FY 1976	
	Number	%	Number	%	Number	%
Cond Code A	22,713	64.1	13,864	64.1	10,296	60.5
Cond Codes F & G	5,131	14.5	3,686	17.0	2,295	13.5
Disposal	7,565	21.4	4,089	18.9	4,425	26.0
Total Lines Rec'd	35,409	100.0	21,639	100.0	17,016	100.0

Source: GSA Headquarters Briefing

Table B-8

WHOLESALE DISTRIBUTION DEPOTS
COST PER LINE ITEM RECEIVED
(FY 1976 DATA)

Activity	Cost Per Line	Activity	Cost Per Line
Army		Navy 2/	
Anniston AD	$14.23	NAS Alameda	$10.50
Corpus Christi AD	17.32	NAS North Island	10.47
Letterkenny AD	15.02	NSC Charleston	5.25
Lexington AD	6.14	NSC Norfolk	14.00
New Cumberland AD	14.00	NSC Oakland	11.87
Pueblo AD	10.98	NSC Pearl Harbor	9.47
Red River AD	19.43	NSC San Diego	4.71
Sacramento AD	22.77	Navy Consolidation 1/	$9.66
Sharpe AD	38.10	Marine Corps	
Tobyhanna AD	25.30	MCLSBLANT 2/	$9.14
Tooele AD	13.45	DLA	
Army Consolidation 1/	$15.70	DCSC	$7.50
Air Force		DESC	5.98
OCALC	$7.25	DDMP	9.53
OOALC	10.19	DDMT	9.61
SAALC	10.78	DDOU	9.16
SMALC	7.83	DGSC	16.65
WRALC	6.44	DDTC	13.02
AF Consolidation 1/	$8.43	DLA Consolidation 1/	$9.07
DoD Consolidation 4/			$11.60
GSA			
Fort Worth 3/			$14.37
Kansas City			46.42
New York			141.02
San Francisco			44.25
GSA Consolidation 4/			$59.10

Source: Army DRSU-238 Report; Navy: NAVSUP Pub 295; NAVCOMPT 2168 and Activity Management Reports; Air Force: LOG 7107 Report; DLA: MIS and Headquarters Briefings; GSA: FSS Book of Statistics For Fiscal Year 1976.

1/ Component consolidation is total Component cost divided by line items received.

2/ Additional Navy and Marine Corps depots receive materiel returns; however, cost data was not available. Activities shown are representative activities for both Components.

3/ Fort Worth Credit Returns Activity deactivated 31 Dec 1975, Fort Worth costs are excluded in GSA consolidation.

4/ DoD data based on total receipts, including those from procurement and returns; GSA data based on materiel returns, to separate materiel returns organizations only.

Table B-9

INVENTORY MANAGER INVENTORY CHARACTERISTICS
STOCK FUND MATERIEL

Activity	1/ Order Cost	1/ Order Value	Order Cost Per Dollar	Surcharge/ Markup Percent
Army				
MICOM	$370.00	NA 2/	NA	8.0
TARCOM	260.00	NA	NA	11.5
ECOM	297.00	NA	NA	10.0
AVSCOM	165.00	NA	NA	10.0
TROSCOM	165.00	NA	NA	11.0
ARMCOM	453.00	NA	NA	8.5
Army Average	$233.33	NA	NA	9.8
Navy				
ASO	$101.15	$1,362.48	$0.07	15.0
SPCC	87.50	1,278.94	0.07	15.0
Navy Average	$94.33	$1,320.71	$0.07	15.0
Air Force	3/			
OCALC	$254.13	$2,670.76	$0.10	13.0
OOALC	297.78	2,488.49	0.12	13.0
SAALC	233.49	2,194.61	0.11	13.0
SMALC	301.70	2,424.70	0.12	13.0
WRALC	257.49	2,679.87	0.10	13.0
Air Force Average	$268.92	$2,491.69	$0.11	13.0
Marine Corps				
MCSA	$225.00	$2,945.31	$0.08	9.0
DLA				
DCSC	$91.71	$510.43	$0.18	7.5
DGSC	91.11	709.79	0.13	7.0
DISC	130.23	781.68	0.17	11.0
DESC	76.62	1,101.79	0.07	16.0
DPSC	171.84	1,039.30	0.17	13.0
DLA Average	$112.30	$828.60	$0.14	10.9
GSA				
Depot Stocked Items	$26.00	$2,610.00	$0.01	11.0

Source: Data submission

1/ Order cost and order value is for procurement less than $10,000.
2/ Army Order Value not available.
3/ Air Force order cost is 1975 cost increased by 10% to reflect two annual pay increases.

Table B-10

VALUE PER DOLLAR OF RETURNED MATERIEL

Wholesale Inventory Manager	1/ Purchase Price	Cost to Order	2/ Procurement Cost Avoidance	Inventory Holding Cost	Present Value of $			
					1 Yr Hence	2 Yrs Hence	3 Yrs Hence	4 Yrs Hence
Army		3/						
MICOM	$.90	$.11	$1.01	$.23	$.813	$.661	$.538	$.437
TARCOM	.90	.11	1.01	.23	.813	.661	.538	.437
ECOM	.94	.11	1.05	.33	.758	.575	.435	.330
AVSCOM	.90	.11	1.01	.23	.813	.661	.538	.437
TROSCOM	.91	.11	1.02	.23	.813	.661	.538	.437
ARMCOM	.92	.11	1.03	.23	.813	.661	.538	.437
Army Average	$.91	$.11	$1.02	$.25	$.800	$.640	$.512	$.410
Navy								
ASO	$.86	$.07	$.93	$.23	$.813	$.661	$.538	$.437
SPCC	.86	.07	.93	.23	.813	.661	.538	.437
Navy Average	$.86	$.07	$.93	$.23	$.813	$.661	$.538	$.437
Air Force								
OCALC	$.87	$.10	$.97	$.22	$.820	$.672	$.551	$.451
OOALC	.87	.12	.99	.20	.833	.694	.579	.482
SAALC	.87	.11	.98	.22	.820	.672	.551	.451
SMALC	.87	.12	.99	.29	.775	.601	.466	.362
WRALC	.87	.10	.97	.28	.781	.610	.477	.373
AF Average	$.87	$.11	$.98	$.24	$.806	$.650	$.524	$.423
Marine Corps								
MCSA Average	$.91	$.08	$.99	$.15	$.877	$.756	$.658	$.572
DLA								
DCSC	$.91	$.18	$1.09	$.18	$.847	$.718	$.609	$.516
DGSC	.92	.13	1.05	.20	.833	.694	.579	.482
DISC	.88	.17	1.05	.18	.847	.718	.609	.516
DESC	.84	.07	.91	.25	.800	.640	.512	.410
DPSC	.93	.17	1.10	.12	.893	.797	.712	.636
DLA Average	$.90	$.14	$1.04	$.19	$.840	$.706	$.590	$.498
DoD Average 4/	$.89	$.11	$1.00	$.22	$.820	$.672	$.551	$.451
GSA								
FSG 51 & 52	$.89	$.01	$.90	$.23	$.813	$.661	$.538	$.437

Source: Data Submission. Purchase Price is estimate based on applicable surcharge. Cost to order and inventory holding cost rate on costs used in stock fund EOQ models. Present Value factors were extracted from standard present value tables.

1/ Materiel cost is commercial contract price plus estimated first destination transportation charge.

2/ Procurement Cost Avoidance is sum of purchase price and cost to order factor.

3/ Army cost to order rate not available. DoD rate is average of available inventory manager rates. DoD average rate is used for Army.

4/ DoD average is average of Available Inventory Manager Rates.

APPENDIX C

GLOSSARY OF TERMS AND DEFINITIONS
Source: DoD Directive 4100.37

APPROVED FORCE ACQUISITION OBJECTIVE (AFAO). The quantity of an item authorized for peacetime acquisition to:

1. Equip and sustain the U.S. Approved Forces in accordance with the latest Secretary of Defense guidance memoranda:

a. In peacetime, through the fiscal year which starts 18 months after the first of January of the same calendar year reflected in the asset cut-off date, including requisite on-hand and on-order supply levels; and

b. In wartime, from D-Day through the period and at the level of support prescribed.

2. Equip and sustain allied forces by satisfying:

a. Requirements of Office of the Secretary of Defense approved prestockage programs for Military Assistance Program (MAP) (grant aid) countries.

b. Requirements of approved supply support arrangements with Foreign Military Sales (FMS) Program countries.

c. Wartime requirements from D-Day through the period and at the level of support prescribed, for those allies authorized this support in the current Secretary of Defense guidance memoranda.

APPROVED FORCE RETENTION STOCK (AFRS). The quantity of an item in addition to the AFAO which is required to equip and support the U.S. Approved Forces from D-Day until production equals the rate at which the item is required. (Applies either to the situation where a part of the Approved Force Structure is not authorized indefinite support, or where the requirement for forces which are authorized indefinite support is not computed on a D-to-P basis; e.g., six months' combat consumption.)

CONTINGENCY RETENTION STOCK (CRS). That portion of the quantity of an item excess to the AFRS for which there is no predictable demand or quantifiable requirement, and which normally would be allocated as Potential DoD Excess Stock, except for a determination that the quantity will be retained for possible contingencies.

(Category C ships, aircraft, and other items being retained as contingency reserve will be included in this stratum.)

DoD EXCESS MATERIEL. Materiel which is determined to be unnecessary for the discharge of responsibilities of DoD after completion of utilization screening among DoD activities in accordance with policies and procedures prescribed by applicable directives.

DoD INTEGRATED MANAGERS (IMs). DLA and Military Service ICPs assigned integrated management responsibilities.

ECONOMIC RETENTION STOCK (ERS). That portion of the quantity of an item excess to the AFRS which it has been determined will be more economical to retain for future peacetime issues in lieu of replacement of future issues by procurement. To warrant economic retention, items must have a reasonably predictable demand rate.

INVENTORY CONTROL POINT (ICP). An organizational unit or activity within a Department of Defense (DoD) supply system which is assigned the primary responsibility for the materiel management of a group of items either for a particular Service or for the DoD as a whole. Materiel inventory management includes cataloging direction, requirements computation, procurement direction, distribution management, disposal direction, and generally, rebuild direction.

POTENTIAL DoD EXCESS STOCK. The quantity of an item above all authorized retention levels but for which final determination as DoD Excess Materiel has not been made.

RETAIL STOCK. Stock which is not regularly controlled by the wholesale manager.

RETENTION LIMIT. The maximum quantity of an item of materiel which has been determined will be retained.

WHOLESALE MANAGER. ICP, DoD IM or the General Service Administration.

WHOLESALE STOCK. Stock which is regularly reported quantitatively to, and regularly controlled by the wholesale manager.

APPENDIX D

ALTERNATIVE METHOD FOR CALCULATION OF BREAKEVEN POINTS

A. INTRODUCTION

This Appendix presents an alternative approach to that shown in Chapter IV for the determination of a "breakeven" point for materiel returns. This is the point where the government is indifferent whether or not to return the item. Line items with an asset value below the calculated breakeven point would not be returned.

Two breakeven points, or threshold levels, are calculated: a level for items returned within the AFAO and a level for those returned beyond the AFAO. The requirement for items returned within the AFAO is assumed to occur at the end of the first year while the requirement for those returned for use beyond the AFAO is assumed to occur at the end of the fourth year. Threshold levels are calculated by balancing the cash flows associated with disposing of a line item and then repurchasing it at a later date (one or four years later) against the cash flows associated with returning the materiel to wholesale inventory and holding it. An equation balancing these cash flows and solved for the return line item asset value yields required threshold values, or "breakeven" points.

B. PROBLEM DEFINITION. The problem is, given an excess line item of a certain value, to determine if it is cost effective for the government to return the line item to stock. It is a two part problem: return the line item for use within the AFAO; or, return the line item for an anticipated future use beyond the AFAO (that may not materialize) and avoid or defer a future procurement.

C. METHODOLOGY. The method used in attacking this problem is to write a "cash flow" relationship where the government is indifferent to two alternative actions. These alternatives are:

1. Dispose of the item and possibly repurchase it in the future; or

2. Return the item to stock and hold for an anticipated need.

The equation, balancing these two alternatives, is shown in block form below. Each of the blocked items is written as an "expected value",[1] and appropriately discounted[2] to account for the "time value of money." All variables contained in the equation are written in terms of the "return line item value" (Cu), and the equation is solved for this line item value. The calculated value (Cu) is the point where the government is indifferent to whether the item is returned or transferred to disposal. Materiel valued less than this indifference value, would be transferred to disposal. Those excess items with values above this indifference value would be returned to wholesale inventory.

Net Disposal Cost	+	Future Procurement Cost	=	Cost To Return	+	Cost To Hold

D. CALCULATION

Each of the blocks in the equation is developed separately from left to right for a general case, and the mathematical formula shown. Additionally, the values associated with returns beyond the AFAO will be developed and the appropriate calculations performed. The result will be a value for returns beyond the AFAO. Subsequently, the simpler cost of returns within the AFAO will also be calculated from the general expression.

1. Net Disposal Cost (NDC). This cost is considered to be negligible for materiel valued at less than $50 per excess line item (see Chapter IV-D).

2. Future Procurement Cost (FPC). This cost, which will occur some time after disposal, is made up of the cost-to-order and the actual commercial price. Each is expressed as a percentage of the asset value (Cu) of the line item. The average cost-to-order for DoD is 11 cents on the dollar as outlined in Chapter IV, and the DoD average purchase price is 89 cents on the dollar of asset value.

Since this procurement will occur in the future, an appropriate discount factor must be applied. This cost is a discrete cash flow occurring at a point in time (assumed to be the end of a year). The correct discounting formula for this type of cash flow is:

$$DF = \frac{1}{(1+D)^n},$$ where n = the year after disposal that the procurement will occur at the end of.

D = .10 as prescribed by OMB CIR A-94

Writing FPC in mathematical terms:

$$FPC = [.11\ Cu + .89\ Cu]DF$$

which is,

$$FPC = (Cu)(DF)$$

and placed in the discount factor formula:

$$FPC = \frac{Cu}{(1+D)^n}$$

As a further ramification of FPC, there is the possibility that the future procurement will not take place because expected demand does not occur or the item becomes obsolete (useless). Therefore, because there is some probability that FPC will not occur, the "expected value" of FPC, written E(FPC) must be used in the equation.

$$E(FPC) = P(A) \left[\frac{Cu}{(1+D)^n} \right]$$

P(A) = the probability that the event A will occur. That is, the probability that the item will be procured in the year (n). This says simply that there is a chance that the item will become obsolete and conversely that there is a chance that the item will remain useful and be procured. It is known that, on the average, an item of inventory has an 11 percent per year rate of obsolescence. That is, the probability of an item becoming obsolete is 11 percent per year. Conversely, the item has a 89 percent probability per year of remaining "useful", i.e., being procured. The probability of occurrence each year is multiplied year by year to give the P(A).

$$P(A) = (.89)^n$$

Therefore, putting it all together,

$$E(FPC) = \frac{(.89)^n Cu}{(1+D)^n}$$

and substituting numbers

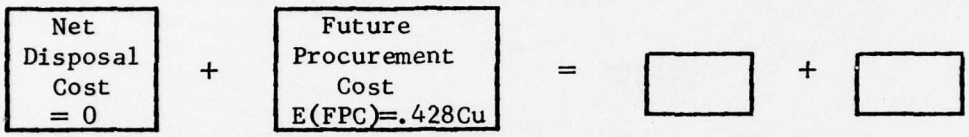
$$E(FPC) = \frac{(.89)^4 Cu}{(1.1)^4} \qquad \begin{array}{r} n = 4 \\ D = .1 \\ Cu = ? \end{array}$$

which is

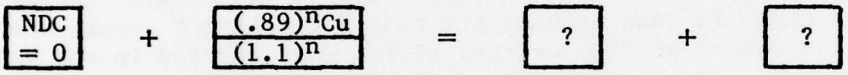
$$E(FPC) = \frac{(.627)Cu}{1.4641}$$

$$E(FPC) = .428Cu$$

The block equation looks like this:



The general equation looks like this:



3. Cost to Return. This cost is calculated in Chapter IV and the value $12.90 is the cost applicable to the return of low dollar value line items to wholesale inventory. It is a constant present value cost and therefore does not require discounting. Its probability of occurrence is 1, i.e., certainty, within the problem defined.

4. Cost to Hold. The cost to hold is taken as the average out-of-pocket expense (per dollar of inventory) for holding an item in DoD inventory, and is one percent of the value of inventory. As was written earlier, if a procurement is to occur, it will happen at the end of the year. The holding costs for the returned item that balances the procurement side must accumulate with the same probability for obsolescence as was explained under Future Procurement Cost, i.e., 11 percent per year. Or, there is an 89 percent probability per year of the holding cost occurring. This cost occurs each year through the last year, and each year will have a different probability of occurrence and a different discount factor. This cost is spread evenly over the years in which it occurs by the very nature of the cost. In discounting this cost, the formula for uniformly distributed costs continuously compounded is used (see DoDI 7041.3). The discounted expected value of cost to hold is accumulated year by year. The accumulated sum of each of the discounted expected values is the expected present value of the cost to hold as shown in the following table.

Year	Probability of Occurrence of Yearly Cost to Hold	Cost To Hold	Discount Factor	Discounted Expected Value of Cost to Hold	Sum
1	.890	X.01C	X.954	= .00849Cu	.00849Cu
2	.792	X.01C	X.867	= .00687Cu	
3	.705	X.01C	X.788	= .00556Cu	
4	.627	X.01C	X.717	= .00450Cu	.0254Cu

The general equation now has terms for disposal, future procurement, cost-to-return, and cost to hold and it is shown below:

$$NDC + \frac{(.89)^n Cu}{(1.1)^n} = 12.90 + \sum_{t=1}^{n} \frac{.1}{Ln(1.1)(1.1)^t} (.89)^t (.01Cu)$$

Returning to the block equation for returns beyond the AFAO, i.e., n = 4 years.

NDC = 0	+	E(FPC) =.428Cu	=	12.90	+	.0254Cu

or, .428Cu = 12.90 + .0254Cu

and, Cu = $32.04

This value $32.04 is the point (value of the line item) below which it is uneconomical to return a line item in anticipation of future use.

The next calculation is to determine a breakeven point for returns within the AFAO. It is assumed that such returns will be needed at the end of year one and will accumulate holding costs for that year. The block equation for this situation is shown below.

NDC = 0 + E(FPC) .8091Cu = 12.90 + .00849Cu

From Chapter IV

From Chapter IV

From Table or General Equation

From E(FPC) = $\frac{.89^n}{(1.1)^n}$ Cu in general equation; substituting n = 1:

$$\frac{.89}{1.1} \text{ Cu} = .8091\text{Cu}$$

$$.8091\text{Cu} = 12.90 + .00849\text{Cu}$$

$$\text{Cu} = \$16.11$$

E. SUMMARY. This appendix has illustrated an alternative methodology for calculation of line item values at which a breakeven point exists between return and disposal alternatives for excess retail materiel. This breakeven point is calculated both for returns beyond the AFAO and returns within the AFAO. The comparative results of this appendix and the method used in the body of the report are shown below:

Return Category	Appendix D	Chapter IV
Return beyond AFAO	$32.04	$28.67
Return within AFAO	$16.11	$15.73

Footnotes.

1. Expected value is the calculated value of an event multiplied by its probability of occurrence.

2. Discounting performed in accordance with OMB CIR A-94 and DoDI 7041.3.

GPO 920-942