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FINAL REPORT
IRO REPORT NO. 282

LEVEL II

AD A100687

OSD STOCKAGE POLICY
ANALYSIS: A SUMMARY

JUN 25 1981
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U.S. ARMY
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May 1981

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ROOM 800
U.S. CUSTOM HOUSE
2nd and Chestnut Streets
Philadelphia Pa. 19106

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER IRO Report No. -282 ✓	2. GOVT ACCESSION NO. AD-A100 687	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) OSD STOCKAGE POLICY ANALYSIS: A SUMMARY		5. TYPE OF REPORT & PERIOD COVERED Final Report
7. AUTHOR(s) W. KARL KRUSE		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS US Army Inventory Research Office, ALMC 5001 Eisenhower Avenue Alexandria, VA 22333		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS US Army Materiel Development & Readiness Command 5001 Eisenhower Avenue Alexandria, VA 22333		12. REPORT DATE May 1981
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		13. NUMBER OF PAGES 20
		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for Public Release; Distribution Unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Inventory Policies Management Analysis Stock Levels		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report is a summary of and a guide to the final report of the OSD Stockage Policy Analysis Working Group. The Working Group was formed to study issues which were raised by the Office of Management and the Budget. Topics studied were implementation of VSL/EOQ, control of manual adjustment to levels, non-demand based stockage, causes of long supply, and the use of program data.		

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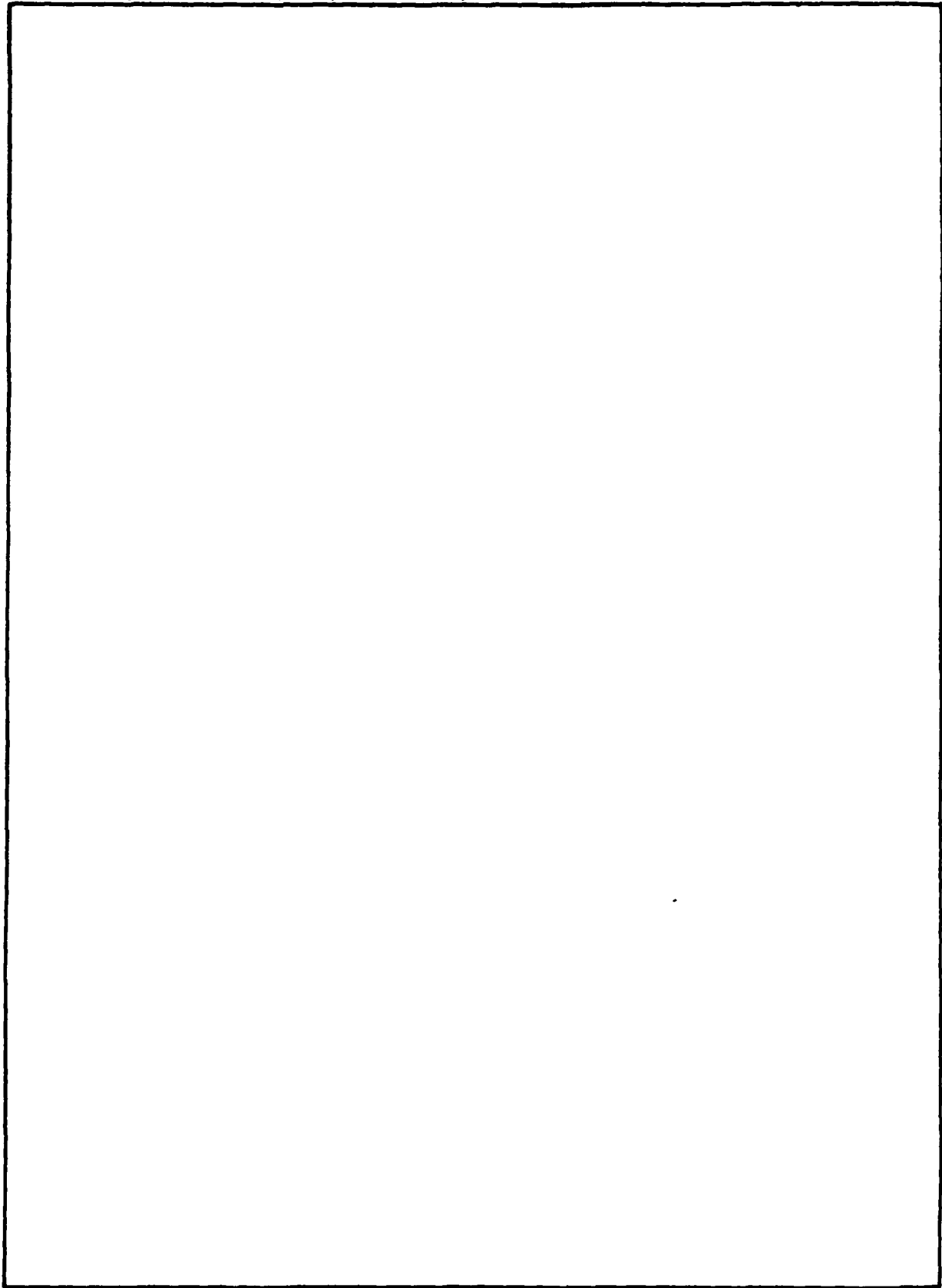
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INTRODUCTION

In response to some issues raised by the Office of Management and the Budget (OMB), the Assistant Secretary of Defense for Manpower, Reserve Affairs, and Logistics established a Steering Group which was responsible for resolving the OMB issues. See Appendix I. A major part of the work was to be done in-house and was assigned to a Working Group composed of personnel from all DoD Components. Appendix II is a copy of the tasks assigned to the working group. Appendix III is a copy of the subsequent study plan developed by the Working Group.

Three sub-groups were formed within the Working Group. One dealt with dual issues related to VSL/EOQ and manual file adjustments; another concentrated on non-demand based stockage; the third was somewhat of a catch-all dealing with the causes of long supply and the use of weapon system program data in requirements computation. There was ample opportunity to participate in all sub-groups, but the group members tended to concentrate their efforts to their own sub-group.

IRO was a member of the VSL/EOQ and Manual File Maintenance sub-group. Occasionally, assistance was given to the Army representative on the Non-Demand Based Stockage sub-group. This report will focus on the work of these two sub-groups.

A voluminous final report [1] was produced by the Working Group, and only a limited number of copies were made. IRO, DARCOM (DRCMM-RS) and TACOM (DRSTA-FPS) have copies, as does OASD (MRA&L). Others are scattered throughout the DoD. Since the final report, despite its size, is easy to follow and documents the group's findings and recommendations well, this report is intended to serve as a road map to the final report and to fill in its gaps. There are three sections to this report. They are VSL/EOQ, Manual File Maintenance, and Non-Demand Based Stockage.

1. VSL/EOQ

The first task here was to document each component's implementation of DoDI 4140.39. All of these are in the Final Report, Annex A, Part 1. These documentations are excellent introductions to requirements computation for those who are unfamiliar with the topic. They are fairly complete in subject matter, although brief in description in some cases.

Once each component had produced the documentation, the documentation was compared to determine differences, and to identify areas for which standardization might be worthwhile. The following issues were raised for potential resolution: budget formulation and execution goals; constraints on maximum safety level; constraints on the procurement cycle; demand forecasting; frequency of procurement review; forecasting lead time demand variance; use of non-recurring demand observations in forecasting demand; computation of the obsolescence rate; probability distribution of lead time demand; range rule for stockage after the demand development period; replacement cost used in models; use of serviceable returns in forecasting and requirements offsets; and controls over VSL/EOQ parameters and constraints. Each of these is briefly discussed in Chapters III and IV of the final report, and in detail in Annex A, Part 3. Many of these, because of their complexity were recommended for long term study. However, a few of these issues were resolved by the working group.

The most significant recommendation from the Army's point of view was that the DoDI 4140.39 constraint on maximum SL be relaxed by removing the restriction that SL be less than forecasted procurement lead time demand. The Army had requested this be done prior to the formation of the Working Group, but OSD eventually decided to allow the Working Group to resolve the issue. Steering Group approval was naturally required also.

Several arguments were used to convince the Working Group that the DoDI 4140.39 SL constraint was too restrictive. It was shown by example (all the components provided examples) that the active constraint was virtually always forecasted PLT demand. It was also shown that high availabilities would not be achieved when the constraint was hit. However, the most convincing piece of analysis was a simulation of 4000 ASF items which compared the present SL constraint to a relaxed constraint of three standard

deviations of lead time demand only. A significant improvement in performance was indicated for the relaxed constraint with equivalent investment in SL and for equivalent risk of long supply. Again, these results are shown in Annex A, Part 3.

The IRO simulator was used for this analysis. It was modified to produce a measure of long supply which, for simplicity, was defined as assets more than two years above the RO. The intent of this measure was to approximate the Budget Stratification measure of long supply. The 4000 items were selected from the IRO data base of aviation items and were selected from a larger group of about 6000 ASF items for which there were associated program data in all eleven years of the demand history.

Another important recommendation made by the group was a change to the methodology for computing the obsolescence rate. The present methodology, which was developed for DoDI 4140.39, is based on an average of historical disposals compared to historical applicable asset levels. The problem with this approach is that the rate is sensitive to disposal policy. In recent years there has been a moratorium on disposal, and the obsolescence rates of several MRCs which were recently recomputed have dropped to ridiculously low values. In order to correct for this, the Working Group recommended that changes in potential excess and contingency retention be included along with disposals when developing the historical rate. The idea here, of course, is to include all assets which should reasonably have been disposed so that the rate is not influenced by disposal policy.

The above two recommendations are the only ones from the VSL/EOQ sub-group which will have an impact on the Army. In general, the present Army policies conformed with the recommendations of the sub-group. In the case of developing stockage range, the sub-group's recommendation actually was patterned after the Army policy of using COSDIF.

There will probably be some long term impact of the group's recommendations on the Army although it is difficult to predict now how much it will be. OASD will be forming an intra-service group in early 1981 to implement all of the Working Group's recommendations.

2. Manual File Maintenance

There were two basic tasks accomplished under this effort. One was documentation of data elements subject to manual change, and the other dealt with management control of manual adjustments.

Each component developed a list of the data elements in its requirements system which can be manually adjusted. For each element, the dimensions, a definition, the application of the element, and any remarks needed to clarify the element's use were recorded. From this, a cross reference was prepared among all components which is organized by generic class, i.e. those which relate to lead times, to program factors, to AMD, etc. Annex B of the final report contains all of the documentation, as well as the cross reference. For those interested, it is probably best to skim the cross reference first even though this is the last element in the Annex. In reviewing the management controls placed on manual file adjustments, each component documented its procedures. This documentation is in Annex B. In addition to the documentation, the sub-group visited TACOM to determine if there were item manager abuses and to determine if the management controls were effective. Originally, this type of review was to be done at ICP's from each component. However, costs and time, as well as the uncertainty of the returns from a management review, led the Working Group to conduct only one review.

To prepare for the review, TACOM was requested to prepare a list of items which had manual adjustments. This was fairly simple to do through a program which searched for freeze codes and printed out each NSN with a frozen data element along with the identification of which elements were frozen. The team selected a sample of items which had several elements frozen and interviewed the item manager and his supervisor. In the majority of cases there seemed to be good reasons for the change. Moreover, the number of items with freeze codes was not that large. The team concluded that there was no abuse by item managers.

As a by-product of the review, TACOM decided to keep the program which searches for items with freeze codes, and in fact, prepared a SCR for implementation within CCSS. The sub-group also recommended that each component develop a similar program. Again, Annex B describes the work done here.

3. Non-Demand Based Stockage Policies

The work of this group was the most controversial, and, at least partly for this reason, was also the most interesting. More importantly, its recommendations have the potential to produce a big change in DoD stockage policy. There were a lot of statistics obtained, for the most part, by groping, and for that reason very few of them are unassailable. Nevertheless, the fundamental policy recommendations made by the group are sound.

Of particular annoyance to the group was that the definitions of the various types of stockage were inconsistent among the components. Consequently, the group produced definitions for demand-based stockage, insurance stockage, numeric stockage, and numeric retention. Generally, these definitions are good. The only problem is that the definition of an insurance item is ambiguous once that item has passed through the provisioning period. The definition talks of "zero" inherent failure probability. During provisioning this nicely equates to a zero maintenance factor. But after provisioning, when maintenance factors no longer play a part in requirement computation, the distinction between insurance items and numeric stockage objective items, which are taken to have "low" inherent failure probability, becomes unclear. For example, does an item coded as an insurance item automatically become a numeric stockage objective once there is a demand for it? Whether this is significant or not depends on whether policies for insurance items will be different from policies for numeric stockage objective items. This is still to be determined.

The most important recommendation made by this group was a by-product of their task to quantify the contribution of non-demand based stockage to supply support. In doing so, they adopted a rather natural extension of the waiting time measure for demand based items prescribed by DoDI 4140.39. The group called this measure "response time," and very simply it is the average time an MRC takes to fill a requisition irrespective of whether the requisition is for a demand based, non-demand based, or non-stocked item.

The group eventually recommended that "response time" be adopted by DoD as a measure of supply performance, and called for development of a "response time" model. Such a model would certainly need to integrate the range and depth decisions, and reasonably would coordinate depth of stockage for demand based and non-demand based items. This will most likely be taken up during the upcoming revision of DoDI 4140.39.

APPENDIX I
LETTER ESTABLISHING STEERING GROUP FOR ANALYSIS
OF OMB ISSUES



ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D. C. 20301

August 13, 1979

MEMORANDUM FOR THE ASSISTANT SECRETARY OF THE ARMY (IL&FM)
ASSISTANT SECRETARY OF THE NAVY (MRA&L)
ASSISTANT SECRETARY OF THE AIR FORCE (RD&L)
DIRECTOR, DEFENSE LOGISTICS AGENCY

SUBJECT: Analysis of DoD Secondary Item Stockage Policies

During their review of the FY 1980 Defense Budget, the Office of Management and Budget (OMB) raised a number of "supply efficiencies" issues that they used to justify substantial reductions in DoD's FY 1980 budget and outyear funding projections. While we have disagreed strongly with the near-term executability of--and estimated savings from--these "efficiencies," several of them clearly identify aspects of current DoD supply management that need a fresh look.

Two key issues raised by OMB are:

a. The amount of so-called "hedge" stocks (i.e., safety levels, non-demand based levels and insurance stocks) being procured and held in DoD inventories.

b. Materiel retention and disposal policies. Here OMB suggests that more detailed and explicit economic retention criteria should be developed and that a major fraction of stocks now held for contingency purposes should be sold off.

As the analysis of these two issues will require significant effort over an extended period, I am establishing a Joint Office of the Secretary of Defense/Service/Defense Logistics Agency Steering Group to oversee these two analytical efforts. The Steering Group will be chaired by the DASD (Supply, Maintenance and Services) (SM&S); the DASD (Requirements Resources and Analysis) will be vice-chairman. I expect to invite OMB to provide an observer on the Steering Group.

The two analytical efforts will be conducted separately. I now envision the "hedge" stock study being accomplished largely in-house by an ad hoc working group, supported by independent in-Service and possibly contractor

assistance. The retention/disposal analysis will be conducted as a contractor study under the auspices of the Steering Group. Enclosures 1 and 2 are preliminary outlines of each study effort with tentative milestones.

Please identify your Steering Group representative to the DASD(SM&S) not later than 10 days from the date of this memorandum. Your representative will be notified later of the specific time and place of the initial Steering Group meeting.

I would appreciate your personal attention to this matter, which will continue to be of major interest to DoD and OMB through the upcoming FY 81 budget reviews.

Enclosures
As stated

(signed)
ROBERT B. PIRIE, JR.
Assistant Secretary of Defense
(Manpower, Reserve Affairs & Logistics)

APPENDIX II

STUDY TASKS DEFINED BY STEERING GROUP

OMB ISSUES
STOCKAGE POLICIES ("HEDGE" STOCKS)
ANALYSIS OUTLINE - TOPICAL AREAS

1. WEAPON SYSTEM PHASE-OUT

A. OMB contends that the Services do not adjust stock fund item procurements in order to respond to major program decreases (Weapon System Phase-Out). DoD Analysis will address the following:

1. What techniques are available and how are these currently used for adjusting such elements as:
 - Demand Base
 - Program factors
 - Future program relationships
2. What information is required in order to adjust procurements for program decreases?
 - End Article Application Files
 - Knowledge of program changes
 - DLA implications/interservice exchange of program information.
3. What management guidelines are used to determine when program relationships are used or adjusted?

II. BUY QUANTITY ADJUSTMENTS

A. OMB contends that the Item Manager can arbitrarily adjust buy quantities. Analysis of the following areas will lead to a determination of whether there is a problem and, if so, the extent to which it exists.

1. Variable Safety Level (VSL)

- How are factors used in VSL computations adjusted,

e.g., Demand Variance, Unit Price, Leadtimes, etc.

- Who can adjust the VSL factors?
- What controls are placed on the adjustments?
- Should a finite policy be developed that would place limitations on the VSL factors? Advantages? Disadvantages?

B. Economic Order Quantity (EOQ)

1. How are factors used in EOQ computations adjusted, e.g., annual dollar value of demands, cost to order, cost to procure?
2. Who can adjust the EOQ factors?
3. What controls are placed on these adjustments?
4. Should a finite policy be developed that would place limitations on the EOQ factors? Advantages? Disadvantages?

C. Manual File Maintenance Adjustments

1. To what extent are manual adjustments allowed for elements impacting the requirements computation process, e.g., Demand Base, Program Changes, Leadtimes, Unit Prices, Failure Rates, Additive Requirements, etc. To what extent are stratification correction cycles used to adjust procurement quantities.
2. What controls and audits are placed on this process?

III. ADDITIONAL STOCKAGE LEVELS

- A. OMB Contends the Non-Demand Based Requirements may be overstated and have not been subjected to cost-benefit analysis.

B. DoD analysis should document the decision process and criteria for development of additional stockage level requirements and quantify these requirements by Service. Document growth trend of these requirements over past five years and reasons for growth.

1. Initial Stockage Levels.

- Examine provisioning process for non-demand stockage.

2. Negotiated Levels/Non-demand based Levels/Numeric Stockage Objectives.

- Determine if an economic analysis approach to computing these requirements is valid. Identify potential projection approaches.

- Analyze management review process and controls.

3. Insurance Items

- What criteria is used by each component to establish insurance items?

- Analyze management controls.

IV. ANNUAL PROCUREMENT/REPAIR COSTS AND EXCESS/CONTINGENCY STOCKS

A. OMB contends that, on an annual basis, the volume of material being recategorized as potential excess/contingency stocks is 10 percent of the volume of new procurement/repair.

1. Current Economic Order Quantity determinations include a cost for obsolescence. Analysis should determine how those costs are used in system and whether costs are valid.
2. Analysis should accumulate actual data for past five years to calculate ratio of procurement/repair to excess.
3. Should this standard ratio be a performance objective? What motivational techniques can be used to meet a performance goal if such a goal is established? Can DoD managers use this performance standard in managing excess/contingency stocks?
 - System-wide?
 - Item-by-item?
4. Task modelers to estimate annual flow of material to surplus given current VSL models, a probabilistic variation in demand patterns, and a supply availability objective of 85%. Conduct an analysis to test sensitivity of flow to demand variation and the supply availability objective.

STOCKAGE POLICIES - "HEDGE STOCKS"
ANALYSIS APPROACH

Phase I. Functional Analysis

- A. Review and document current Service/DLA policies and procedures for each topical area. Include responsibilities and management controls.
- B. Develop proposed concepts, procedural or systems alternatives, as required, or reconfirm adequacy of current methods.

Phase II. Statistical/Mathematical Analysis

- A. Develop plan for statistical analysis including data elements required.
- B. Complete data call and perform statistical analysis as required for each topical area.
- C. Develop a detailed concept paper for each proposed statistical or mathematical model to be proposed. Where current approaches/models are to be retained, document justification rationale.

Phase III. Integrate Functional/Statistical Analyses

- A. Determine any basic policy revisions which may be required.
- B. If analysis determine that revisions to stockage policies are needed, applicable DoD Issuances should be reviewed and proposed revisions identified.
- C. Prepare a feasibility/cost effectiveness analysis for each major proposed policy alternative.

- D. Develop specific proposed policy revisions to current DoD Issuances integrating functional/mathematical approaches.
- E. If a reduction in levels is appropriate, determine to what extent the current stock levels are satisfied by existing assets, i.e., quantify the current procurement and repair requirements associated with these levels.

MILESTONES

1. Identify resources required to complete analysis and prepare tasking - 1 September 1979.
2. Complete Phases I and II of Study - 1 January 1980.
3. Complete Analysis - 31 August 1980.

OMB ISSUES
RETENTION/DISPOSAL POLICY
ANALYSIS OUTLINE

I. POLICY REVIEW

- Document details of the Services/DLA policies and compare with OSD policy. Identify differences between policy and actual execution.
- Quantify current economic retention, contingency retention and potential excess stocks for stock fund and appropriated fund secondary items by Service/DLA or commodity groups as appropriate. Develop an annual demand/usage baseline for each category. Develop three or four year trends for these data.

II. RETENTION POLICY ALTERNATIVES/REVISIONS

- Collect, document and evaluate proposed policy changes as recommended in various recent studies, GAO and Audit Reports associated with retention policies.
- Develop a basic economic retention model for DoD-wide application to include appropriate cost elements (e.g., holding costs, proceeds from sales, disposal costs, probability of future need - including demand variance and end item obsolescence).
- Develop a detailed statement of objectives to be used as the basis for a comprehensive contingency retention policy including standard subcategories for contingency retention (anticipated foreign sales, estimated future demand - no past demand, end items in system).
- Revise economic and contingency retention and potential excess/disposal policies. Include specific guidance for partial disposals and FMS retention.

III. PRELIMINARY ACTIONS ON UNNEEDED STOCKS

- Based on the interim results of Paragraph II, above, prepare a plan to initiate disposal action for "unnecessary" contingency retention and potential excess stocks. This plan should incorporate the most practicable/implementable proposed new policies, but should develop disposal quantities conservatively to hedge against overreaction until new policies are formally staffed and approved.
- Using the statistics collected in Paragraph I, above, and current requirements computations/stratifications develop a time-phased schedule for disposal of unnecessary stocks during the FY 1980/82 time frame.
- Prepare a tasking memorandum to the Services/DLA to accomplish the above actions.

MILESTONES

1. Complete analysis outline - 15 May 1979 (Completed)
2. Prepare final analysis outline - 25 May 1979 (Completed)
3. Identify resources required to complete and prepare tasking - 15 July 1979 (Completed)
4. Select contractor for study effort - 31 July 1979 (Completed)
5. Complete study effort - 31 August 1980

STOCKAGE POLICY ANALYSIS PLAN OF ACTION & MILESTONES

MAJOR SUBJECT	LEAD COMPONENT	POINT OF CONTACT	TASK NO.	ISSUE	SUB-TASK		MILESTONES											
					NO.	SCOPE	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.				
Non-Demand Based Stockage Policies	AF	Diann Lawson	0001	Current Definitions, Policies and Quantification	A. Document Policies B. Prepare Data Call Presentation (WG) C. Data Collection/Presentation (WG) E. Determine Inconsistencies	01/29 01/31	02/12		04/22	05/27								
			0002	Contribution to Improved Support Objectives	A. Material Support Measures B. Define Data Call C. Status Report (WG) D. Complete Data Call E. Status Report (WG) F. Analyze Data G. Data Analysis Model	01/28 01/31	02/12		04/22 04/22	05/16 05/27								
			0003	Develop DDB Stockage Policy	A. Assimilate Current Policies B. Assess Level of Detail C. Prepare Policy Presentation (WG) E. Draft Final Report						06/27	07/08	08/22					
			0004	Identify Areas for Follow-on Study	A. Potential Improve- B. Literature Search C. Future Studies								07/18 07/18	08/22				
Weapon Systems Relationships	Army	Bill Higgins	0001	Program Data Usage	A. Survey Existing Systems B. Documentation C. Presentation (WG) D. Develop Policy E. Presentation (WG) F. Analyze Systems G. Recommend Policy H. Draft Final Report	01/15 01/25	02/12	03/30	04/22 (Long Term) (Long Term)	06/27								

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<u>1</u>	Dep Chf of Staff for Logistics, (DALO-SMS), Pentagon, Wash., DC 20310
	HQ, US Army Materiel Development & Readiness Cmd, Alexandria, VA 22333
<u>1</u>	DRCMM-RS
<u>1</u>	DRCPA-P
<u>1</u>	Commandant, US Army Logistics Mgt Center, Ft. Lee, VA 23801
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<u>1</u>	US Army Military Academy, West Point, NY 10996
<u>1</u>	Director, Army Materiel System Analysis Activity, ATTN: DRXSY-C, Aberdeen Proving Ground, MD 21005

