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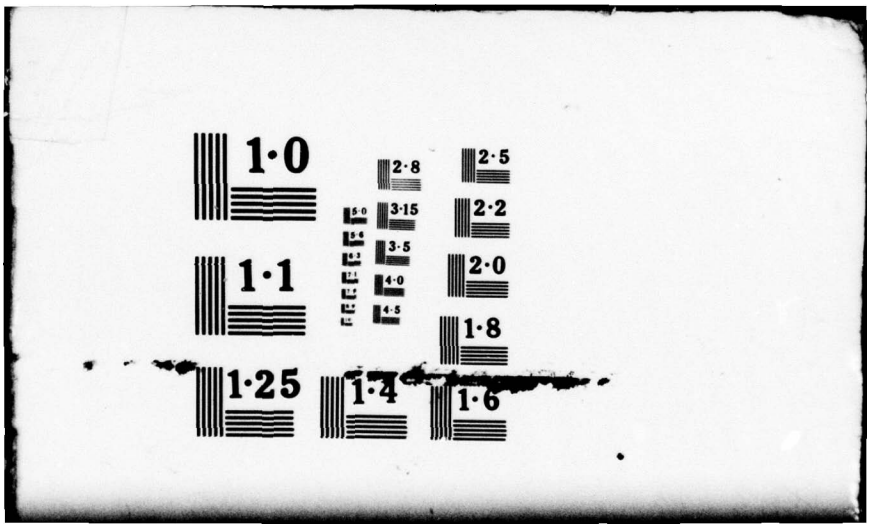
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Monterey, California

THESIS

BUDGETING FOR REPAIRABLE SECONDARY ITEMS
AT THE
NAVAL ELECTRONIC SYSTEMS COMMAND

by

Ryan L. Hanson

September 1978

Thesis Advisor: A. W. McMasters

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The Naval Electronic Systems Command (NAVELEX) manages both principal and repairable secondary items but has not been able to obtain funding for procuring new secondary items to replace those which are no longer repairable. It has also been only able to obtain level funding for repairs. It is estimated that this has resulted in an annual shortfall of $18 million. This study recommends that determination of secondary items

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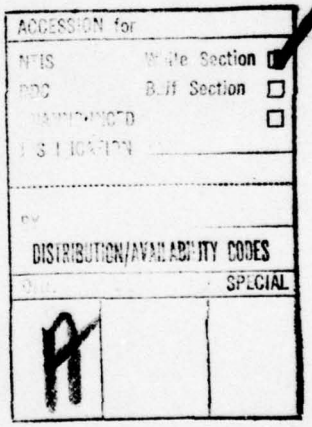

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(6) Budgeting for Repairable Secondary Items at the Naval Electronic Systems Command.

by

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ABSTRACT

The Naval Electronic Systems Command (NAVELEX) manages both principal and repairable secondary items but has not been able to obtain funding for procuring new secondary items to replace those which are no longer repairable. It has also been only able to obtain level funding for repairs. It is estimated that this has resulted in an annual shortfall of $18 million. This study recommends that determination of secondary items to be managed by NAVELEX be postponed until provisioning of the parent principal item. The budget for repair pipeline and initial attritions of these secondary items could then be justified as a spares procurement line item. The use of the stratification program of the Naval Supply Systems Command (NAVSUP) is recommended for budget justification for both post-provisioning replenishment procurements and repairs of these secondary items.

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LIST OF ABBREVIATIONS

APA	Appropriations Procurement Accounts
APN	Aircraft Procurement, Navy
ASO	Aviation Supply Office
ASU	Approval for Service Use
B05	Repairable Management Monitoring System
CLAMP	Closed Loop Aeronautical Management Program
COG	Cognizance Symbol
CNM	Chief of Naval Material
CNO	Chief of Naval Operations
DART	Detection, Action, and Response Technique
DLSC	Defense Logistics Support Center
DOD	Department of Defense
DRIPR	Disposal, Requisition, Issue, Procurement and Restoration
FIRM	Fleet Intensified Repairable Management Program
FMSO	Fleet Material Support Office
HSC	Hardware Systems Command
ICP	Inventory Control Point
ILS	Integrated Logistics Support
MDF	Master Data File
NAVAIR	Naval Air Systems Command
NAVELEX	Naval Electronic Systems Command
NAVMAT	Naval Material Command
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command

NIIN	National Item Identification Number
NIMSSR	Non-Consumable Item Material Supply Support Request
NRFI	Not-Ready-For-Issue
NSF	Navy Stock Fund
O&MN	Operations and Maintenance, Navy
OPN	Other Procurement, Navy
OPNAV	Office of the Chief of Naval Operations
POC	Preliminary Operational Capability
PPR	Planned Program Requirement
PTD	Provisioning Technical Documentation
R&D	Research & Development
RFI	Ready-For-Issue
SPCC	Ships Parts Control Center
SSR	Supply Support Request
STRAT	Stratification
TAT	Turn Around Time
UICP	Uniform Inventory Control Program
WPN	Weapon Procurement, Navy

I. INTRODUCTION

A. HSC MANAGED ITEMS

"A Hardware Systems Command (HSC) is responsible for the development, planning, programming, acquisition, installation, logistics, and technical support and guidance for a particular class of weapons systems and their related equipments required in support of all facets of naval operations throughout the system/equipment life cycle." (1) This includes providing some supply support for at least the initial segment of the life cycle. This supply support includes both principal and secondary items.[1]

Principal items are major assemblies such as aircraft engines, complete radar sets, and gun mounts. Acquisition of these items is accomplished through procurement appropriations such as Weapons Procurement, Navy (WPN), Aircraft Procurement, Navy (APN) and Other Procurements, Navy (OPN). (2) Attrition of a principal item should only result from "major/total destruction." (3)

Secondary items are spare parts, repair parts, and consumable supplies. Examples are avionics components, fuses, clothing, and office supplies. Secondary items can be further classified by the funding process as Appropriations Procurent Account (APA) or Navy Stock Fund (NSF). The APA items can be repaired, usually at designated overhaul points. They are also

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[1]See Appendix A for detailed definitions of principal and secondary items.

available at no cost to the consumer, who is expected to return the carcass of the old item or justify his requirement in some other manner. The NSF items are expense items (non-repairable) and are charged to the consumer's operating budget when issued. (2)

B. STOCK COORDINATION

The Chief of Naval Material (NAVMAT) has emphasized that supply management is more logically a function of the Naval Supply Systems Command (NAVSUP) than of the HSCs. To this end NAVMAT has established a set of criteria to be used to determine who should manage an item over its life cycle. These criteria are enclosure (1) of NAVMATINST 4440.37C and are included in this report as Appendix B. They basically say that NAVSUP will manage an item no later than after two years of operational use unless engineering design problems still exist or NAVMAT authorizes the HSC to continue management.

The process of transfering items from the HSCs to NAVSUP is called stock coordination. A history of stock coordination was presented in the thesis of Pettersen-Casey. (4)

Recently NAVMAT has reemphasized the importance of stock coordination and is attempting to develop stricter criteria for sustained supply management of an item by an HSC. Seebeck discusses these proposed criteria. (5) A major feature of these stricter criteria is that NAVMAT considers the Approval for Service Use (ASU) as indicating stability of design.

The Naval Electronic Systems Command (NAVELEX) is the HSC responsible for the development of all types of electronic

equipment for the U. S. Navy. The rapidly changing field of electronics technology makes difficult the determination of the point when design stability has been attained. Data on certain NAVELEX managed equipment suggests that these equipments can be unstable in design even though they have received the ASU.

In spite of the problems of instability, NAVELEX strongly supports the concept of stock coordination and is in the process of attempting to transfer management of over one-half of their items (approximately 850 items) to NAVSUP's Ships Parts Control Center (SPCC). They have also attempted to retain items which they consider to be unstable.

When a transferred item is found to be unstable by SPCC, it is normally transferred back to the originating HSC until the problems can be resolved. This "reverse" transfer can be detrimental to providing the necessary logistic support for the fleet. Fortunately, the necessity of using this procedure is rather rare.

C. BUDGET PROBLEMS

In addition to the stock coordination policy pressures from NAVMAT, there are also financial pressures. The charter of an HSC as described in Naval Supply Systems Command Manual, Volume II does not indicate exactly whether HSCs manage exclusively principal items, exclusively secondary items, or a combination of these items. Rather it simply states the types of components each HSC is responsible for developing for use by the Navy. Numerous telephone conversations with stock

coordination personnel at the NAVMAT, OPNAV, and HSC level of management confirmed that there is no clear definition of an HSC's inventory management responsibility regarding principal and secondary items. This situation has created serious budgeting difficulties for NAVELEX. (1)

The budgeting problem for secondary items centers on unplanned requirements and has two parts; that

1. funding cannot be obtained for attritions, and
2. only level funding is provided for both making repairs and procuring field changes/modification kits.

One reason for this problem may stem from the fourth retention criterion in NAVMATINST 4440.37C which says that an HSC can be assigned specific supply management responsibility of an item by NAVMAT directive, but that this would be "limited to items of major importance and depot level reparables." (6) The latter part of this quote does imply items other than principal, however.

A second reason for the problem may be that HSC managed secondary repairable items are not being identified as such in the provisioning process. In other words, some items which NAVELEX initially identifies as Cognizance Symbol (COG) 2Z items should more logically be sent through the provisioning process for COG and inventory management determination. (The COG is a two digit symbol peculiar to only the Navy. It is used to distinguish between types of materials managed by different echelons of supply.) This will be further discussed in Chapter III.

D. SCOPE OF THIS STUDY

Clarification of the central problem areas and suggested approaches to solutions have been the topic of previous NAVELEX sponsored research studies at the Naval Postgraduate School, Monterey. (1, 4, 5) The research reported in this thesis is part of a continuing effort to help resolve NAVELEX inventory management problems.

The budgeting problem is analyzed in depth in this study and several alternatives are suggested for obtaining increased funding. This increased funding is important to all phases of a new item's life cycle. In particular, it facilitates both the initial supply support and the stock coordination process.

The austere budget situation at NAVELEX causes all secondary items to have poor initial support. This problem continues for at least a year after migration to SPCC because NAVELEX financial resources which are transferred to SPCC as part of the stock coordination process are limited to repair funds. Because of the lengthy budget process, two years can elapse before the new item will impact on SPCC's budget input to increase funds.

Limited funds and instability thus combine to make difficult the determination of the point when transfer of management should occur in the life cycle of an item which is initially managed by NAVELEX. Resolution of the budgeting problem should simplify subsequent effort to determine when an item is stable enough to migrate to SPCC.

II. THE NAVELEX INVENTORY MANAGEMENT PROBLEM

A. THE NATURE OF ATTRITIONS

Attritions of repairable items can occur in three principal ways:

1. failing or being damaged when put into use or during repair, to the extent that subsequent repair is not possible.
2. ceasing to be economically repairable due to being worn out.
3. being damaged or destroyed in transit between the user and the repair facility.[2]

The case of NAVELEX managing a repairable item which finally reaches the age where it can no longer be economically repaired is unlikely since the item would have normally been transferred to SPCC by that time. The cases of NAVELEX managing an item experiencing early unrepairable damage or failure in use or in transit are typical. High rates of failure can be expected during the "debugging" phase of the life cycle of an electronic component due to "burn-in," incorrect use by inexperienced personnel, and design problems. While it might be logically argued that research and development (R&D) funding should pay for all aspects of debugging, in reality it is not allowed. Debugging continues after the item has received its ASU, but R&D funds may not be expended after the ASU. (5) The urgency of improved

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[2]Being thrown overboard as "junk" is included in this category.

operational capability within the fleet tends to push HSCs toward an early ASU.

B. SPARE ITEMS

Unplanned requirements do occur for both principal and secondary items. Principal items tend to experience fewer demands than do secondary items (probably because the former consist of repairable secondary components). However, because NAVELEX is considered to be managing principal items, they have little difficulty in obtaining one or two "spare equipments" in the budget process.

The basic Navy policy on spare equipments is contained in OPNAVINST 4200.4B. The use of a principal item as a major spare is expensive and does require detailed analysis before budget submission. Further, due to high unit cost, a supply item of this nature must appear as a separate line item on the budget. (3)

The Navy's rationale of having such systems on hand can best be expressed as follows:

> "Spare systems, or units thereof which are classified as 'principal items', are required to provide expeditious replacement in event of major damage (e.g., from fire, collision, explosion, storm, or battle damage). Having on hand, assembled and complete systems or units thereof has proved cost effective in avoiding delays in construction, conversion, and overhaul programs, and is expected to continue to prove its worth in assuring the readiness of Navy units to carry out their missions." (3)

The spare systems may be programmed if the following criteria are both met:

1. The provisioning process has not provided all items necessary to completely assemble the equipment, and
2. Non-availability of a spare system will result in a serious mission degradation of a combatant unit. (3)

The guidelines further indicate that fifty (50) or less Planned Program Requirements (PPR) for the equipment are sufficient authority to budget for one (1) spare equipment. For additional PPRs beyond 50, authorization for one additional spare equipment is provided. If further additional spare equipments are required, recommendations with accompanying justification are to be forwarded through the chain of command. (3) Currently, NAVELEX has no formal means of justifying any requirement which exceeds the normal one or two spare equipment policy.

NAVELEX manages modularized principal items that are composed of secondary repairable items. Typical examples are the AN/WRT-1 Family and the AIMS System. If the equipments making up such items did have the benefit of the provisioning process then perhaps one or two spare principal items would be sufficient because sufficient secondary equipments would be available to provide replacements for equipments requiring repair. Unfortunately, many of these equipments do not get included as secondary items in the provisioning process. Current NAVELEX procedures for processing all new 2Z items result in all such items being viewed as principal items at the budget table. (A summary of the provisioning process will be presented in the next chapter).

A serious compounding of the problem follows. If a secondary equipment is not available to replace a failed one of its kind in an installed principal item, then the next higher assembly is requested; namely, another copy of the principal item. Repair costs then go up because the whole principal item is turned in for repair even though it has only one failed modular equipment (secondary item).

C. FINANCIAL IMPACT

The annual funding requirements for attritions for the items which NAVELEX will retain after the next stock migration in January 1979 have been calculated at $6.21 million using data obtained from SPCC. This indicates that for unplanned requirements alone, NAVELEX has a serious financial problem. The data used was based on forecasted unplanned demand, carcass return rates, and repair survival rates for all 2Z COG items in the Master Data File (MDF) at SPCC.

Funding requirements for component rework have been calculated from the same data to be $3.12 million. It is important to note that this is for the value of unplanned requirement restorations. The $3.12 million value resulted from using 25% of new purchase cost as the cost of repair. The 25% value was suggested by reference (2). An important point is that cost, although the important issue here, is not the only consideration. The procurement leadtime for procurements generally exceeds repair turnaround time for the same item.

NAVELEX also uses repaired items to fill planned requirements rather than initiate a procurement action. Since NAVELEX

actually manages secondary items, too, it is necessary to add the $3.12 million to the planned requirement funding for 2Z COG restoration to arrive at a total restoration budget.

It should also be noted that level funding has been the rule for the last several years for restoration and procurement of field changes/modification kits. Each of the past several years' budgets have provided approximately $11 million for restoration and $3 million for field changes/modification kits.

NAVELEX requested $20 million for planned requirement repairs in the 1980 budget. This is considered to be a realistic amount, but it is far greater than the current $11 million actually received. NAVELEX personnel indicate that a one-time amount of $3 million for field changes/modification kits would probably catch them up on needed changes. These inadequate fundings can only result in a decreasing part of the repairs being made and only the most important field changes/modifications being funded.

An alternative source of funding is available through the Detection, Action, and Response Technique (DART) program. Items qualifying for that program are those identified by the fleet as being problems needing correction in order to maintain material readiness in the fleet. The funds are intended to provide repairs and improvements such as field changes/modification kits. Currently, NAVELEX has only one item in this program, the AN/URT-23. Unfortunately, extensive justification is required from both the HSC and the fleet before an item can qualify for the program. (7)

In summary, the financial impact of the NAVELEX inventory problem is an annual shortfall of approximately $18 million. Half of this quantity has been requested for component rework of planned requirements. The other half is for unplanned requirements, and NAVELEX has no approved budget channels for requesting it.

III. CONSIDERATIONS IN BUDGETING

A. PROVISIONING

Any suggestions for obtaining initial funding for attrition and repair requirements must consider the OPNAV-approved provisioning process. A new item normally evolves from a project and should be considered to be a secondary item unless it is easily identifiable as a principal item. Any secondary item so identified is associated with some principal item and determination of spares for the secondary item will then be a part of the provisioning phase of the integrated logistics support (ILS) plan for that principal item. Provisioning funding justification is the responsibility of the program manager.

OPNAVINST 4423.5 dated 9 August 1976 details the extent of the Navy's policy on system initial support and requires that DODINST 4140.42 dated 7 August 1974 be the basis for determining the range and depth of spare and repair parts procured for the initial support of new weapon systems or equipments. (8) Paragraphs 4.b, 4.c, and 4.e of OPNAVINST 4423.5 provide relevant policy details:

> "4.b. When an end item is programmed and budgeted for development or procurement, the associated requirements for spares will be included within the spares budget line for investment items and within the Navy Stock Fund budget for expense items.
>
> 4.c. The provisions of this instruction are applicable to all secondary item support programs, including interim or contractor supported initial spares, as well as the regular provisioning programs of the systems commands, other acquisition managers, and inventory control

points (ICPs). To the maximum possible extent, ICPs will compute all spare and repair parts requirements for all secondary item support programs.

4.e. Wholesale and retail system frequency of demand for spare parts (repairables) will be computed in the COSDIF[3] or approved exception rules as: replacement stock for attrition plus the depth of stock necessary to satisfy anticipated demand for the repairable item during estimated repair turn-around time (TAT)." (8)

The duration of initial support provided by provisioning is not to exceed two years beyond the date of preliminary operational capability (POC), that point in time when installation in the fleet is scheduled to begin. This would occur sometime after the ASU.

The provisioning process essentially begins at the inception of a new principal equipment. When an HSC receives its nomenclature and system designation, a COG is assigned to the equipment and an equipment cataloging request is sent to the appropriate ICP. Generally, SPCC handles this task for NAVELEX and NAVSEA, while the Aviation Supply Office (ASO) responds to NAVAIR requests.

Upon receipt of the cataloging request, the ICP prepares the necessary documentation and forwards it to the Defense Logistics Support Center (DLSC) in Battle Creek, Michigan. DLSC reviews the technical package and processes it through an automated program to obtain a National Item Identification Number (NIIN). If an item previously had a NIIN assigned by another service, the DLSC informs the ICP and the information

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[3]The COSDIF is explained in DODINST. 4140.42.

is passed to the HSC. This occurs in only rare instances.

By the time the HSC receives the NIIN for the new equipment, the actual contractor selection may be near completion. Upon award of a contract, the contractor becomes responsible for providing provisioning technical documentation (PTD) to the provisioning ICP. This information includes manufacturer's drawings, part numbers, individual spare part failure data, etc. The PTD should be received at the ICP within 90 days of contract award (but more often the actual lead time is almost one year). The ICP then documents the individual parts, modules, etc., in the same manner as discussed before, and requests a DLSC screen for NIINs for these items.

Some of these secondary items may already be common to existing systems within the service or DOD. If an item is found to be common to an existing system then it has an existing NIIN, and the appropriate item manager at the ICP level or elsewhere in DLA is sent a request for additional support. This is in consonance with the stock coordination policy of having one manager per item of stock. The request will be for increased depth of support of the NIIN on the basis of perceived increased need. The request is denoted as merely a supply support request (SSR) for consumable items. The equivalent request for a non-consumable item or repairable is called a non-consumable item material supply support request (NIMSSR).

If an item is truly new, it receives a NIIN from DLSC. The ICP and a detachment from the HSC which developed the principal item then determine if the item should be managed by the Navy

or by some commodity manager in DLA or GSA. COGs are assigned at this point to Navy-managed items.

The extent to which a new item will be stocked is determined by the ICP based on guidelines from DODINST 4140.42. Specifically, SPCC uses a process developed by FMSO and detailed in SPCCINST 4400.30C dated 31 August 1977.

The principal item installation schedule is used to determine an estimate of the number of principal items needing support during the two years following the POC. Data from the contractor on estimated failure rates and maintenance schedules allows determination of the attrition rate and the size of the repair pipeline for secondary items.

An equation (called the COSDIF) comparing the two-year expected costs of stocking an item with those of not stocking it and then needing it is used to determine if it is worthwhile to stock the item. The quantity to stock is determined based on the risk of a stockout during the two years (it is essentially the reorder point for an item having a two-year procurement leadtime). Certain items may be subsequently classified as insurance items even though they failed the COSDIF test and one unit is usually stocked.

The budget request is for the sum total of the procurement costs for all items to be stocked. If the actual budget received is less than that requested, the insurance items are procured first, followed by those passing the COSDIF test, starting with the one having the highest risk of stockout and continuing through lower and lower risk items until the actual budget has been consumed.

Further repairable item procurements after the provisioning buy are considered to be replenishments but are also funded from the OPN budget. Repair, called component rework, is funded from Operation and Maintenance, Navy (O&MN). After initial provisioning, the program managers are no longer concerned with defending either type of funding. The appropriate inventory manager and involved HSC are responsible for defense of budget requests from this point on in the life cycle.

B. STRATIFICATION

The problem of obtaining follow-on funding for replenishment and component rework of secondary item spares can be most logically resolved by developing an OPNAV-approved budget request procedure. The stratification program (STRAT) in the Uniform Inventory Control Program (UICP) automated system is such a procedure. (9) STRAT is the process by which all Navy Inventory Control Points (ICP) establish their proposed budgets and justify funds for anticipated requirements for post-provisioning support of an item. It is a technique which determines how much material will be needed by the supply system to satisfy forecasted requirements for the budget year.

The STRAT simulates buys and component rework for needed items based on forecasted demands and procurement leadtimes or repair turn-around-times contained in the Master Data File (MDF). The estimated total costs of the simulated procurements or repairs become the total budgets requested. (9). As mentioned earlier, the budgets for procurement and rework are prepared and submitted through different appropriation accounts.

C. MONITORING CARCASS RETURNS

A repairable unit of an item which is not returned for repair may force a procurement action for its replacement and the cost of the replacement may be four times that of the cost of repair. (2) As a consequence, monitoring of such "carcasses" is important for reducing procurement costs.

Carcass tracking has been a system-wide problem in the repairable world for a number of years. Prior to 1973, there were NAVSUP instructions detailing procedures for turn-in of old carcasses after requisitioning/receiving the new item, but active monitoring of turn-ins was not done.

In 1973, SPCC established the Fleet Intensified Repairables Management Program (FIRM) to 1. maximize carcass returns, 2. minimize repair turn-around times, 3. expedite handling of all RFI and NRFI repairable items, and 4. exercise positive issue control requiring a carcass return for each replacement issue. (10) ASO had previously established a similar program known as Closed Loop Aeronautical Management Program (CLAMP).

Both FIRM and CLAMP are used for specific highly critical repairables. All information regarding issue and turn-in is documented by message at the time of the initial request. All turn-in documents must bear the same requisition number as the requisition for the replacement item. Delays in turn-in are identified quickly and a reminder message is sent requesting an explanation as to why the carcass has not been turned in.

Also in 1973, another program was created to manage the less critical repairables. This program is referred to as the

Repairables Management Monitoring System (Application/Operation B05). (10) It also matches turn-ins and issues by document number in an effort to monitor carcass returns. B05 allows 45 days to transpire between issue of the replacement and turn-in of the carcass. If 45 days have passed and the carcass has not yet been turned in, a reminder message is automatically sent to the requisitioning activity. The program has had limited success, according to SPCC.

IV. RESOLVING THE BUDGET PROBLEM

A. PROVISIONING OF SECONDARY ITEMS

Currently, no 2Z COG is currently assigned to any secondary item identified through provisioning. Any secondary item which NAVELEX wants to manage is coded 2Z COG before it gets a stock number and long before provisioning occurs. The consequence of this early assignment to 2Z COG is that the item is initially supported via the provisioning process by 4G (repairable) and 1H (consumable) secondary items, but spares of the 2Z secondary item are limited to those allowed for a principal item.

The message should be clear that more spares for 2Z secondary items could be justified by delaying assignment of 2Z COG to a secondary item until the provisioning of the parent principal item. The assignment of a 2Z COG could be made at the same time that 4G and 1H are assigned if the secondary item was deemed to qualify based on retention criteria (2), (3) or (4) in Appendix B. The NAVELEX detachment at SPCC could make the 2Z assignment if the acquisition engineer was able to convince its members that it was in the best interests of the Navy. This procedure should be formalized and reasons for 2Z COG assignment should be documented in detail.

A formalized procedure should also be developed for determining which items should initially be assigned COG 2Z before provisioning. Since such items will be viewed as principal items in the budget process, there should be

convincing evidence that unrepairable failure would be only from catastrophic causes.

B. FOLLOW-ON SUPPORT OF SECONDARY ITEMS

The need for an OPNAV-approved HSC budgeting procedure for spares replenishment and component rework could be most easily accomplished by using a procedure such as SPCC's STRAT. Perhaps the quickest way to do this would be to share management of certain items with SPCC after changing the item COG from 2Z to 4G. This would provide a 4G budget justification using SPCC's stratification procedure.

The primary disadvantage of this alternative is that, in reality, there would be two item managers: one at SPCC and one at NAVELEX. Navy policy prescribes that there shall be only one manager. However, the wording of retention criteria (4) of NAVMATINST 4440.37C does appear to allow this first alternative in the case of principal items or depot level repairables (see Appendix B).

In the past an item which "migrated" from NAVELEX to SPCC changed its COG from 2Z to 4G and all aspects of supply management were transferred to SPCC. However, the engineering responsibility continued to belong to NAVELEX. The other HSCs, NAVSEA and NAVAIR, also retain the engineering responsibilities for items they migrate to SPCC or ASO.

At the Stock Coordination Meeting on 26-29 June 1978, the items being considered for transfer from 2Z to 4G were categorized by NAVELEX as either A, B, C, D, or E. (These categories are listed in Appendix C). Categories A, C,

and D allow SPCC to manage in the way that they have done in the past; categories B and E give SPCC very little management responsibility. In these latter categories, NAVSUP ICPs store the item and issue it. Category E items cannot be issued without the approval of NAVELEX. Without a specific directive from NAVMAT allocating primary management of items in categories B and E to NAVELEX, it would seem unlikely that SPCC would find the limited management of such items to be worth the additional coordination efforts required when an item has two managers.

The development of procedures by NAVELEX for OPNAV-approved replenishment and component rework should not be very difficult since the STRAT procedure used by SPCC is OPNAV-approved. In addition, NAVSO P-1500 makes all facilities of an ICP available to any inventory manager in the Navy. To obtain an appropriate STRAT for budget purposes, NAVELEX would need to ensure that the data on the MDF is kept up to date. Currently, the details on due-ins are not being transmitted to this file and, as a consequence, the inventory position of an item as indicated by MDF records is in error by the quantity on order.

NAVELEX should also take advantage of the automated level setting procedures developed by the Fleet Material Support Office (FMSO) which are an integral part of the UICP in determining order quantities and reorder points for both procurements of attrited items and component rework. In addition to making a viable STRAT for budget estimating, it

should reduce variable inventory management costs, improve responsiveness to the customer, and reduce the number of inventory managers needed by NAVELEX.

C. MONITORING CARCASS RETURNS

Even if NAVELEX does nothing in the way of seeking additional funding through developing approved budget procedures, it should benefit from monitoring its carcass returns.

NAVELEX currently has 22 of its 2Z items in NAVSUP's FIRM program. However, NAVELEX has not bothered tracking the carcasses for the remainder of its 2Z items unless an inventory manager deemed an item to be in short supply. The estimated $6.21 million annual attirition costs mentioned in the second chapter should be sufficient motivation for NAVELEX to initiate use of the UICP monitoring program B05 at the very least.

In addition, NAVELEX should determine the actual survivability rate of items being repaired. The data from SPCC shows a rate of 85% for virtually all 2Z items and suggests that this value is a manager-entered "override" rather than the actual value. Actual values are needed if the STRAT for component rework is to be representative of reality. Knowing the actual values can also aid in identifying items which are difficult to repair and in monitoring the quality of work done by the repair depots.

V. SUMMARY AND CONCLUSIONS

NAVELEX manages both principal and secondary items, but it has experienced difficulties in obtaining funding for procurement and repair of the secondary items. Procurement of replacements for attrited items is currently not possible through standard budgeting channels, and component rework is only level funded.

The reason for no funding for attrited items appears to be that all 2Z items are treated like principal items by NAVELEX during provisioning. This is apparently unintentional. The cause is the pre-provisioning assignment of the 2Z COG to an item by acquisition engineers and inventory managers who wish to keep the item under NAVELEX management for at least two years after approval for service use (ASU). A primary reason for this is that the item is considered to still be unstable in design or requires an engineering decision for each issue.

This thesis recommends that only items which can be defended as being principal items be assigned a 2Z COG prior to provisioning. During the provisioning of the principal item, the repairable secondary items considered to be defendably unstable by NAVELEX could be given a 2Z COG. The procurement of spares of these secondary items could then be included in the OPN budget item justification sheet for electronic spares and repair parts for the principal item. The number of needed spares could be justified from the

PTD engineering data on estimated failure rates and repair frequencies.

Follow-on support of repairable secondary items requires both attrition procurements (replenishment) and repairs (component rework). An OPNAV-approved stratification (STRAT) process is the logical medium for requesting funding. The STRAT from the UICP could easily be used if NAVELEX updates the data base and follows the level setting procedures of the UICP for both replenishment and component rework. A side benefit is a reduced workload for NAVELEX inventory managers.

Carcass tracking of repairable secondary items would help reduce the need for procurements by preventing unnecessary losses of carcasses between their removal from the installed principal item and their entry into the repair process at the designated depot. In addition, actual survivability rates from the repair process need to be determined if the STRAT is used to reflect actual budget needs.

Resolution of the funding problem will provide for support of fleet requirements at the level that SPCC can provide without the current delay created by any design instability and the stock migration process. The financial pressure to prematurely migrate from COG 2Z to 4G would be alleviated, reducing the chance of a reverse migration with its associated problems.

The question of when an item becomes stable in design can then be studied without financial aspects clouding the issue.

APPENDIX A

CLARIFICATION OF TERMS (11)

Principal items are specifically designated by CNO and are characterized by the following management and material considerations:

(1) Requirements determined on a planned basis by the cognizant SYSCOM;

(2) Requirements based solely on planned end-use allowances and planned reserve/retention requirements;

(3) Separate budget formulations through Materiel Planning Studies and Principal Item Stratifications;

(4) Procurements financed exclusively with appropriated/investment funds;

(5) Attrition based solely on major/total destruction, intended destructive use, or planned retirement;

(6) Issues to end-use strictly limited to SYSCOM-established allowances or special SYSCOM-approved authorizations.

Secondary items are those items not classified as principal items and exhibit the following characteristics:

(1) Requirements determined by the cognizant ICP;

(2) Requirements based either on estimated/observed demands or non-demand based insurance levels;

(3) Budget formulations based upon standard levels-setting techniques and standard Secondary Item Stratification projections;

(4) Procurements financed either with investment funds or stock funds, as governed by such factors as unit price and recoverability;

(5) Attrition based primarily on normal in-service wear-out or consumption;

(6) Issues to end-use subject to limitation on the basis of established allowances but more typically limited only on the basis of quantitative validations.

APPENDIX B

NAVMAT STOCK RETENTION/TRANSFER CRITERIA (6)

Code 0 - Withdrawal of Interest.

Code 1 - Items in a Research and Development Stage. Items qualifying under this category must be under development and not yet in Fleet operational use.

Code 2 - Items Requiring Engineering Control Decisions. This criterion is applicable when a high degree of engineering judgment is required concerning design or relationships to a system. It pertains principally to those items requiring engineering decisions during production or prior to each issue. Items that remain in this category after two (2) years of operational use must be justified in the same manner as Criteria Code Four (4) Items of this Instruction.

Code 3 - Items Unstable in Design. Items which are determined by an engineering decision to be highly subject to design change of the item itself, or replacement of the item through modification of its next higher assembly. End items, components, assemblies, test and evaluation equipment unstable in design do not exclude their intrinsic parts from stock coordination review. Items retained for management under this category will be transferred to an ICP

after completion of two (2) years operational use unless a major design change or modification has been approved and/or is being accomplished at the time of the Stock Coordination Review. Further retention upon completion of the approved design change or modification must be justified in accordance with Criteria Code Four (4).

Code 4 - Items Expressly Assigned to a Single Command Management by Separate Authorizing NAVMAT Directives. Items qualifying for this category are limited to items of major importance and depot level reparables. Inclusion in this category is a matter for CNM decision based upon justifying rationale submitted by the originating Command. As a general rule items changed from Criteria Codes (2) and (3) into this code will be transferred to an ICP for inventory management even though the procurement function remains at the headquarters level. Items assigned under this criterion will be considered as an adjunct to stock coordination and therefore, are not precluded from formal review when scheduled.

Code 5 - Selected for Transfer.

APPENDIX C

NAVELEX TRANSFER CATEGORIES

The following categories are to be considered during the stock coordination review.

Category A

Identifies 2Z COG demand oriented items that are migrated to SPCC for inventory management control. This will include budget input to NAVELEX and procurement responsibilities. Engineering responsibilities remain within NAVELEX.

Category B

2Z COG items migrated to SPCC for which procurement, budget, and engineering responsibilities remain at NAVELEX.

Category C

2Z COG items migrated to SPCC and DRIPR coded to indicate that an HSC engineering decision is required prior to issue. These instances are normally confined to configuration considerations. Procurement and budgeting responsibility belong to SPCC.

Category D

2Z COG items migrated to SPCC for which SPCC will provide to NAVELEX budget backup data and perform procurement responsibilities. However, the engineering responsibilities have been or will be assigned to a NAVELEX TMA.

Category E

2Z COG items migrated to SPCC which NAVELEX maintains procurement, budgeting, and engineering responsibility, but which are DRIPR coded so that SPCC consults NAVELEX prior to issue.

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