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A Comparison of Alternative Methods of Obtaining Defense Logistics Agency (DLA) Cognizance Spare Parts for Contractor Furnished Equipment (CFE) During Initial Outifitting of New Construction U.S. Navy Ships

by

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A Comparision of Alternative Methods of Obtaining Defense Logistics Agency (DLA) Cognizance Spare Parts for Contractor Furnished Equipment (CFE) During Initial Outfitting of U.S. Navy Ships

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ABSTRACT

This thesis is a limited determination of the most cost effective method of acquiring Defense Logistics Agency (DLA) cognizance initial outfitting material for new construction ships. The study is restricted to Contractor Furnished Material (CFM) required to support Contractor Furnished Equipment (CFE) contained in the Hull, Mechanical, Electrical, Ordnance and Electronics (HMEO&E) Coordinated Shipboard Allowance List (COSAL). Three alternative methods of procuring the material are analyzed for cost effectiveness: (1) the shipbuilder procures the material commercially, (2) the shipbuilder is allowed access to the Federal Supply System (FSS) and requisitions the material, (3) the Naval Supervising Activity (NSA) requisitions the material from the FSS in which case it becomes Government Furnished Material (GFM). Material availability using each of the alternatives is also examined.

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INTRODUCTION

A. PURPOSE

This thesis attempts to improve the process of acquiring initial outfitting allowance material for new construction ships. It builds on studies already conducted on the outfitting process that have challenged the methods currently used.

The study will be limited to the spare parts required to support end items that are considered Contractor Furnished Equipment (CFE) contained in the Hull, Mechanical, Electrical, Ordnance and Electronics (HME0&E) Coordinated Shipboard Allowance List (COSAL). These repair parts are known as Contractor Furnished Material (CFM).

The focus will be to determine the most economical and efficient method of acquiring CFM that is National Stock Numbered (NSN) and under the cognizance of the Defense Logistics Agency (DLA).

B. OBJECTIVES OF THE RESEARCH

This thesis will consider three alternatives:

1. The shipbuilder procures the material commercially.
2. The shipbuilder is allowed access to the Federal Supply System (FSS) and requisitions the material.

3. The Naval Supervising Activity (NSA) requisitions the material from the FSS in which case it becomes Government Furnished Material (GFM).

The alternatives will be compared to ascertain if one is more cost effective and efficient. The alternatives were chosen because they have been used in the past, have been recommended as possible methods by other studies, or are currently being used today.

When examining each of the alternatives, a broad range of costs must be considered in addition to material costs. These costs, such as manpower costs, are not as easily discernable as the material prices. Each alternative must have all hidden costs included to determine the true impact on the Government.

Achieving the minimum Government cost is not the only criteria that must be investigated. Availability of material is as critical as cost because of the tight time schedules for building Navy ships. Material shortages may actually cost the Government more money in terms of work stoppage and contractor claims than would be saved if the bottom line price of the material is the only factor considered.

C. RESEARCH QUESTIONS

Given the above objectives, the following question was posed: What is the most cost effective and efficient method for the Government to provide CFM requirements under DLA cognizance during the construction of U.S. Navy ships?

In order to answer the basic research question, the following subsidiary questions were investigated:

1. For each alternative, what are the costs of the material?
2. For each alternative, are there hidden opportunity costs not normally associated with CFE material procurement that must be included?
3. Is there a difference in the availability of material between the three alternatives?
4. How will the alternatives affect the work loads of the responsible commands and what is the impact?
5. What are the Naval Sea Systems Commands (NAVSEA) Program Office's attitudes towards each of the three alternatives?
6. Are there significant contractual changes that must be made for each of the alternatives and do they represent any costs to the Government?
7. Are funds programmed properly for implementing each of the alternatives?

D. SCOPE AND LIMITATIONS

The main thrust of this study is to examine all of the costs, along with material availability, of each of the alternatives. The study concentrates on ships built during the 1983-91 time frame. Ship types were chosen to represent a broad cross section of current shipbuilding programs. Procedures for implementing the alternatives among the various commands is beyond the scope of this paper and will not be addressed.

E. METHODOLOGY

Data was collected via literature searches, telephone calls, and personal interviews with various people at the headquarters and field levels. The empirical data on costs was provided by Program Offices at NAVSEA.

The model chosen for comparing costs will formalize the process of choosing among the alternatives. The model will serve as a means of communication to help decision-makers and analysts arrive at a clearer understanding of the problem.

Basically, the model will identify and value the costs that are associated with each of the alternatives. A simple cost comparison format will highlight the impact of the cost on the alternatives and their totals.

Efficiency is defined as availability of material. It will be dealt with by presenting final outfitting percentages that programs have achieved by using one of the three alternatives. The alternative with the best outfitting percentage will be deemed to be the most efficient.

F THESIS ORGANIZATION

This study is organized into five chapters. Chapter I is the introduction. Chapter II provides a background of the problem. Chapter III describes the new construction outfitting process for DLA material. Chapter IV addresses availability of material under each alternative. Chapter V

consists of the cost comparisons of the alternatives. Chapter VI presents the research conclusions and recommendations.

II. BACKGROUND

The best method of providing Contractor Furnished Material (CFM) has been debated for the last ten years. In order to fully understand the data in the following chapters, a detailed history of the CFM controversy must be presented.

Up until the early 1980s, Defense Logistics Agency (DLA) material was wholly the providence of the contractor. The shipbuilder usually procured the CFM on the commercial market, normally using the same supplier from which he purchased the Contractor Furnished Equipment (CFE) [Ref. 1]. This responsibility was delineated in Naval Sea System Command (NAVSEA) shipbuilding contracts [Ref. 1]. However, in many cases, the shipbuilders were not procuring the material themselves, they were sub-contracting the work out to firms specializing in spare parts procurement.

About this time, the Department of Defense (DOD) began to receive criticism for its spare parts procurement policy. [Ref. 2:p. 52]. Because of the tremendous amount of negative press, the Secretary of Defense (SECDEF) tasked the services with reviewing their policies with an eye towards price reduction.

In 1983, the DOD Assistant Inspector General (AIG) conducted several inspections of initial spare part procurements for selected major systems. The OHIO Class

submarine was one of the programs reviewed. In the audit, the AIG team found that contractor item prices could not be compared to the Federal Supply System (FSS) prices. But, they noted that "the contracted negotiated rate (for purchasing spare parts) was excessive." [Ref. 3:p. 4]. The AIG recommended that the SSBN Strategic Submarine Program Office, NAVSEA (PMS 396), use the FSS for future OHIO Class acquisitions [Ref. 3:p. 8].

In replying to the AIG, the Navy agreed with the intent of the recommendation but felt further study was warranted. The various "logical reasons" for continuing to obtain spares as CFM were:

1. The standardization of equipments and supporting spare parts, particularly when the shipbuilder is procuring several ship sets of equipment to support a flight of ships;
2. The minimization of form, fit, and function problems;
3. Economies to be gained by large shipbuilder procurements;
4. The availability and timeliness of receipt of spare parts. [Ref. 4:p. 4]

As criticism from Congress continued to mount, DOD responded by issuing DOD Directive (DODD) 4140.40. This required DOD activities to use the FSS as the first source of supply [Ref. 5:p. 1]. The Chief of Naval Operations (CNO) defined the Navy's position by stipulating:

> That items of supply that had National Stock Numbers (NSN) should be obtained from the FSS or through normal FSS replenishment procurement unless it can be justified

> economically and/or provided in a timely manner or prices charged for spare parts provided by commercial contractors are "fair and reasonable". [Ref. 6]

Despite the direction from DOD and CNO, NAVSEA continued to support its decision to use CFM based on the following paragraph from DODD 4140.40:

> Consideration shall be given to ordering support items to be used as spare and repair parts concurrently with support items to be installed on end items during production when this can be justified economically or is justifiable for support considerations (for example, the timely availability of the support items) and when obsolescence of potentially unstable designs can be managed. [Ref. 4:p. 4]

As a first step in implementing the CNO's and DOD's directions, NAVSEA began to conduct a series of investigations into procurement policies. The principal test program was the outfitting of the fourth flight of the Oliver HAZARD PERRY Ship Class (FFG-7). The study determined that a sizeable portion of the CFE was under DLA cognizance and could be obtained through the FSS. A significant cost difference was also discovered between the price of the material in the FSS and what the vendor charged to procure it.

The price difference occurred because the FSS had no shipbuilder overhead and used large quantity buying power to obtain price breaks. Using the FSS also increased outfitting material availability at time of ship delivery and aided in material standardization. As a result of the test program, NAVSEA PMS 399, the FFG-7 Class Frigate Ship Acquisition

Project Manager (SHAPM), changed its policy for the last eleven hulls of the FFG-7 Class Frigate Program. Detailed data from the FFG-7 program will be presented later in this thesis.

In reporting the FFG-7 findings to the DOD AIG, the Assistant Secretary of the Navy (Shipbuilding and Logistics) (ASN (S&L)) noted "preliminary results indicate that utilization of DLA systems to the fullest extent is economical and efficient" [Ref 7]. Specifically, it was noted that "it was economical in most cases to use the Federal Supply System and it is efficient to use the FSS for initial outfitting material managed by the DLA" [Ref 7]. Additionally, "the system was responsive to new construction program initial outfitting requirements such that outfitting readiness goals could be met" [Ref 7].

Even though the FFG-7 study supported using the FSS, NAVSEA continued to have concerns based on availability of material and manpower costs. The opinions of the SHAPMs in response to the FFG-7 study and AIG audit report were expressed in a NAVSEA SEA 91 memo, in April 1986. The major worries were:

1. If SHAPMs use FSS to requisition material, it would deplete the stock of material positioned to support the operating forces, possibly forcing them to go without required material.
2. It would increase the Supervisor of Shipbuilding, Conversion and Repair, USN (SUPSHIP) workload and the

Outfit Supply Activity (OSA) - the result of which would be to fall short of the 97% outfitting goal.

3. Converting a fill or kill requisition into Government Furnished Material (GFM) would result in a contract modification requirement after each Incremental Stock Number Status Listing (ISNSL) to send rejected items to the contractor to buy.

4. Tracking material would be more complicated and less accurate. [Ref 8:p. 3-5]

Opponents of using the FSS also pointed out that material requirements for outfitting new construction ships were not forecasted to the FSS. Therefore, DLA would not have material on-hand to support both active and new construction ships. In addition, the budget for Shipbuilding and Conversion, Navy (SCN) was allotted on the basis of forecasted requirements. Addition of the CFM material would result in a shortage of SCN outfitting dollars.

After reviewing the AIG and FFG-7 reports, the ASN (S&L) directed that the shipbuilder use the FSS as the first source of supply for outfitting/interim support requirements [Ref. 9]. It was then up to NAVSEA to implement the procedures to carry out this direction.

NAVSEA has developed Technical Specification (TECHSPEC) Number: S0300-A2-SPN-010. The purpose of the TECHSPEC is to provide procedures for shipbuilders to gain access to the FSS. Problems have been encountered, however, that have forced NAVSEA to suspend the TECHSPEC. Naval Supply Systems Command

(NAVSUP) is currently working on procedures that would allow this TECHSPEC to be implemented.

The Federal Acquisition Regulation (FAR) provides a further complication for Program Managers wanting to allow the shipbuilder access to the FSS. FAR clause 51.100 requires a study be conducted for a shipbuilding program to determine if it is in the Government's "best interest" to allow access [Ref. 10:p. 51-1]. If it is, then the study's findings must be placed in the contract. The cost of the study and the resulting contract changes are additional burdens for which many Program Managers do not have the funds.

It was not until the SSBN 740 was built in FY 1988 that NAVSEA PMS 396 got an opportunity to implement the AIG recommendation to fill requirements through the FSS [Ref. 11:p. 8]. NAVSEA PMS 396 had to determine if they wanted the shipbuilder to pull the material from the system, thus keeping it CFM, or have the Naval Supervising Activity (NSA) requisition the material, making it GFM [Ref 11:p. 2].

One of the primary results of their study was to question the cost effectiveness of allowing the shipbuilder access to the FSS to obtain DLA material. In their study, they have shown that a further reduction in cost of CFM material is possible if the Government requisitions the material from the FSS and provides it to the contractor. [Ref 11:p. 13] The PMS 396 study is discussed in greater detail later in this paper.

Current shipbuilding programs continue to specify that the shipbuilder is responsible for procuring DLA material. The only exception is the AOE-6, USS SUPPLY, shipbuilding program. Here the NSA is SUPSHIP, San Diego. SUPSHIP, San Diego, has begun buying all CFE under $100.00 from the FSS.

The above has been a brief history of the CFE material procurement practices. The next chapter will describe the spare part outfitting process for DLA material.

III. INITIAL OUTFITTING MATERIAL

Providing initial outfitting material to a U.S. Navy ship is a complicated, time consuming, and expensive process. For purposes of this thesis, the term "outfitting material" will apply to those items of material required as a result of the defined allowances, specifications, and documentation of ships being constructed.

As noted earlier, the process of providing this material has been under review for some time. A lack of definitive policy guidance has been blamed for the Navy's poor showing during audits and reviews. Following the tenants of Total Quality Leadership, NAVSUP initiated a Process Action Team (PAT) to investigate the process and make recommendations for improvement. At the invitation of NAVSUP, NAVSEA agreed to join the New Construction PAT.

One of the objectives of the PAT process was to define the nominal process that detailed the "flow of all data, actions, decisions, products, and events related to provisioning and outfitting, from the award of a ship construction contract to sailaway with all spares on board". [Ref. 12:p. 7] However, the study found that a multiplicity of procedures were being followed simultaneously by various commands [Ref. 12:p. 2]. Rather than describe all of the variations that exist, the nominal process presented by the PAT will be discussed.

Providing outfitting material begins with the generation of technical documentation by the design and ordering process and ends when the ship has received all initial allowance material [Ref. 13:p. 5]. The talents and skills of a large number of people are required to achieve the goal of having 97% outfitting material onboard by ship delivery [Ref. 14: Enclosure 1].

There are five stages to providing outfitting material to a ship. They are: provisioning, configuration development, allowance preparation, outfitting, and fitting out. See Figure 1.

It is impossible to cover in depth the five stages in just one chapter. Instead, the procedure will be outlined so that readers unfamiliar with the topic can better understand the material presented in later chapters.

A. PROVISIONING

Provisioning extends over a wide range of functions. They include "design, development, maintenance planning, supply, requirements determination, item entry control, procurement, cataloging, and contract administration." [Ref. 5:p. 1] The goal of provisioning is to deliver a range and depth of support items for initial outfitting or lay-in of in-service support at supply activities. It must be done for each individual piece of equipment that comprises a ship.

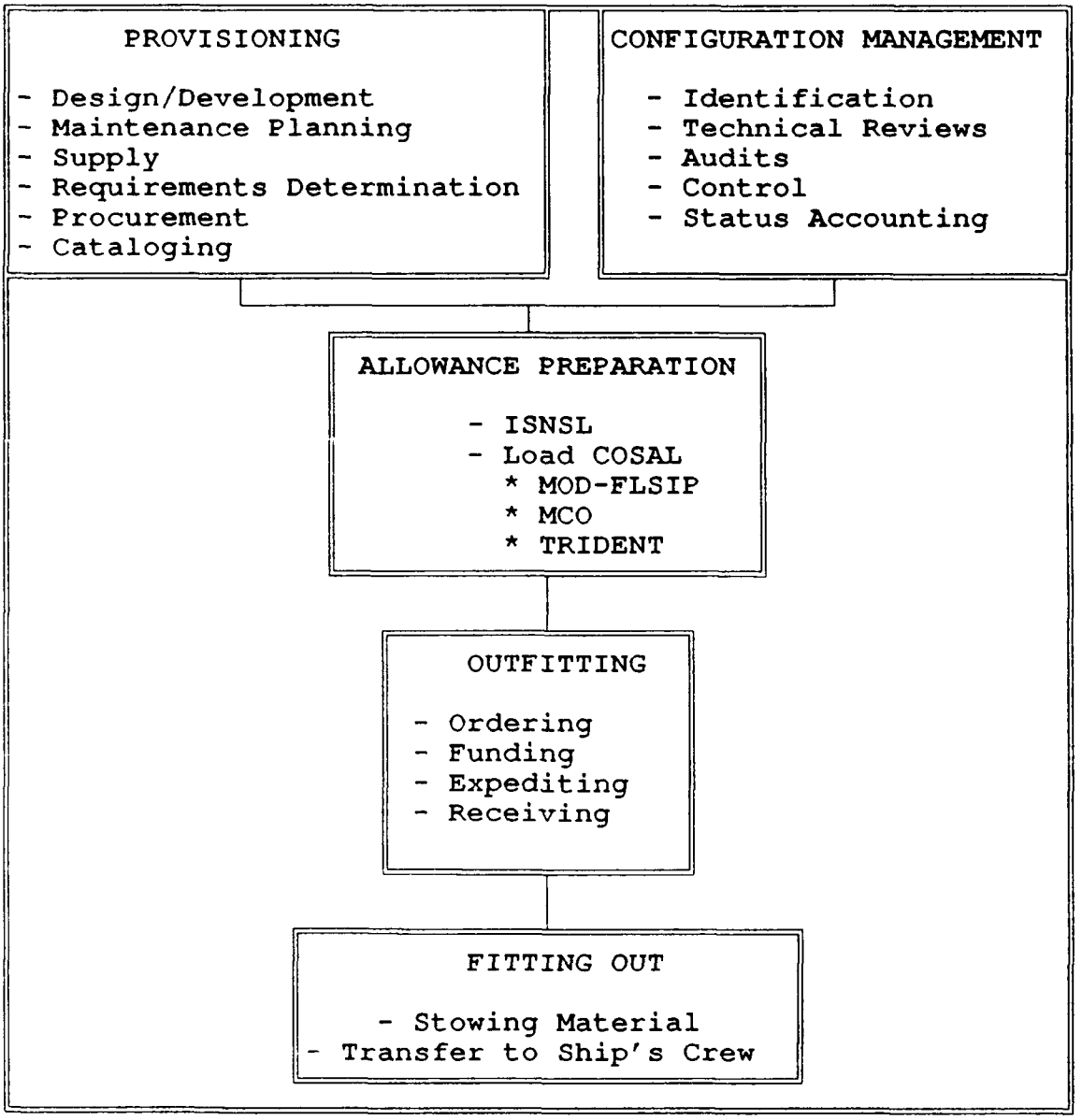

Figure 1. Outfitting Supply Support Procedures

The provisioning process actually starts during the feasibility and preliminary contract design phase [Ref. 12:Appendix B]. Logistics Support Analyses (LSA) are conducted to ensure that the required contract line items,

work statements, and Contracts Data Requirements Lists (CDRL) are included in the contract.

Provisioning culminates with the development of allowance lists and the lay-in of material. The allowance list is the end product of the provisioning process and the building blocks of the ship's Coordinated Shipboard Allowance List (COSAL) [Ref. 15:p. 8].

Provisioning is a joint responsibility between the Chief of Naval Operations, NAVSEA, the In-Service Engineering Agents (ISEA), the vendors, and SPCC [Ref. 15:p. 8]. Each organization has a specific task it must accomplish for provisioning to be successful. Figure 2 outlines the provisioning process and the relationships of the participating commands.

The equipment's Program Manager at NAVSEA is responsible for developing the maintenance concept, the performance data, and installation schedules [Ref. 15:p. 8]. This data is used by SPCC in developing the range and depth of required spares.

The equipment manufacturer is required by MIL-STD-1561A and MIL-STD-1552A to submit Provisioning Technical Documentation (PTD). PTD is for "identification, selection and determination of initial requirements and for the cataloging of support items." [Ref. 5:p. 3-1]

The vendor also furnishes Supplemental Provisioning Technical Documentation (SPTD) along with the PTD to provide

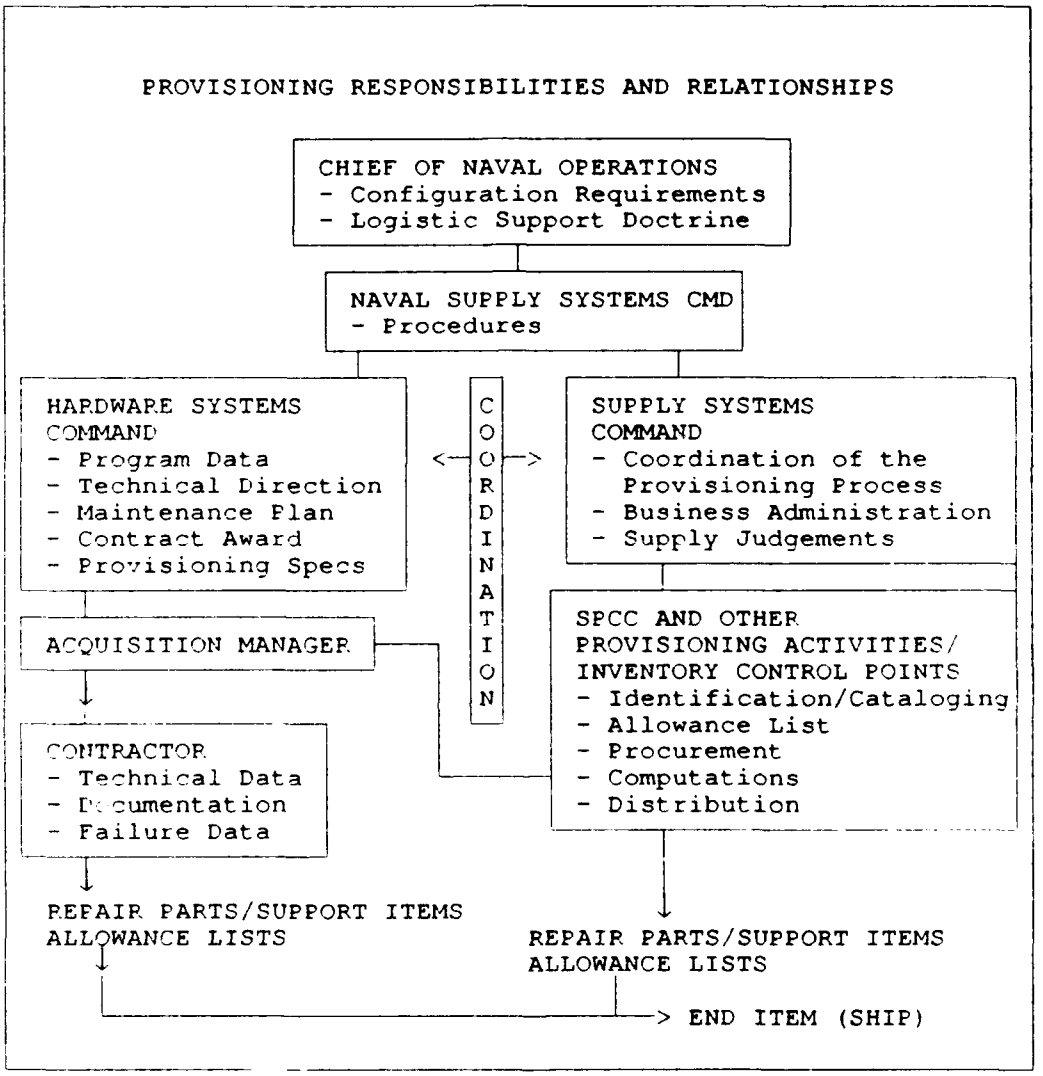

Figure 2. Provisioning Process and Command Responsibilities.

(Source:Small, W., "A Decision Strategy for the Acquisition of CVN Q-COSAL Target Date Material", MS Thesis, Naval Postgraduate School. 1991)

additional information. SPTD is used to assign National Stock Numbers (NSNs), ensure standardization, and assist in preparing allowance lists.

The ISEAs combine the input from the Program Manager and the PTD to develop Lead Allowance Parts Lists (LAPL). SPCC uses the LAPLs to compute the initial spares and wholesale stock requirements needed to support the equipment.

A key objective in the provisioning process is to ensure that Item Managers (IM) of equipment at DLA and SPCC are alerted of expected increases in demands caused by new installations of equipment. For DLA items, Supply Support Requests (SSR) are sent to the Defense Logistics Agency Network. For items managed by SPCC, the IMs also receive SSRs.

Using the inputs from the PTD and SPTD, SPCC generates Allowance Parts Lists (APL) and Allowance Equipage Lists (AEL) [Ref. 15:p. 10]. The APL provides a complete list of all maintenance worthy parts for an equipment.

All of the above data is placed in a number of different data systems to ease making supply decisions. One of those systems is the Weapon System File (WSF). The WSF maintains the configurations of all Navy ships and repair parts data in two separate files.

Level A of the WSF contains information about the ship and a listing of equipments installed on the ship. The ship's Unit Identification Codes (UIC) and equipments are linked by Repairable Identification Codes (RIC) and Application/Identification Number Activity Codes (AINAC) [Ref. 16:p. 12]. It is important that the accuracy of Level A be maintained because it is through this file that a ship receives its piece parts support [Ref. 2:p. 16].

Level C of the WSF maintains the piece part information for APLs/AELs developed during the provisioning and cataloging process. Level C entries are those in which the APL represents a maintenance worthy system, equipment, or components. Level C contains information about the equipment, Next Higher and Next Lower Assemblies (NHAs/NLAs), a breakdown of the parts associated with the APL, technical information that applies to the parts, and supplemental, narrative data [Ref. 16:p. 13]. The entries in Level C are tied back to the end use items in Level A.

B. CONFIGURATION MANAGEMENT

Configuration Management (CM) is the foundation of an effective logistic support system. It is a key driver for cost efficient, well supported equipment, and impacts ship

operation, repair, maintenance, and modernization [Ref. 16:p. 1].

More than just tracking which systems and equipment are installed on a ship, configuration management is the combined and systematic application of the following elements:

1. Configuration Identification
2. Technical Reviews
3. Configuration Audits
4. Configuration Control
5. Configuration Status Accounting [Ref. 16:p. 1]

Historically, Configuration Status Accounting (CSA) has been the focus of CM. Until recently, the Navy used the WSF Level A as the central repository for ship configuration and associated logistic support information.

In the early 1980s, the Navy transitioned to the Ship's Configuration and Logistics Information System (SCLSIS). The Level A of the WSF is still used by SPCC to build the Coordinated Shipboard Allowance Lists (COSAL) but it is now updated via the SCLSIS database, the Real Time Operation Management Information System (ROMIS), and Fitting Out Management Information System (FOMIS). These three configuration management systems are discussed below since it is through these systems that a new construction ship is

identified with its installed equipments. Figure 3 demonstrates the flow of information in the configuration management process.

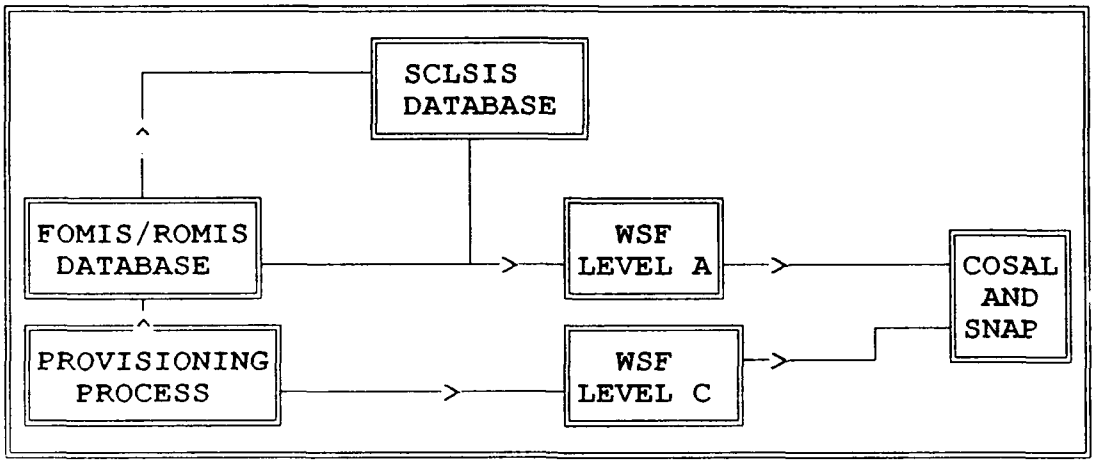

Figure 3. Configuration Data Management Flow

1. **SCLSIS**

SCLSIS goes beyond the CSA emphasis contained in the WSF Level A. More than just an ADP system, SCLSIS is a set of rules and procedures for managing the total configuration management of a ship [Ref. 17].

In SCLSIS, each ship class has an activity assigned as the Configuration Data Manager (CDM). After CDMs "initialize" the class into SCLSIS, they are responsible for the total configuration of the ships [Ref. 16:p. 2]. The CDM is the single activity with authority to update the SCLSIS database.

The CDM inputs data into SCLSIS that reflects the authorized equipments installed as well as supply support requirements, technical manuals, Planned Maintenance System data, and a variety of other technical information. The SCLSIS database is also used to update the Shipboard Nontactical ADP Program (SNAP) II computers on board ships. While Level A of the WSF was designed around one logistic element, supply support, SCLSIS uses configuration to drive several logistic elements vice just the one [Ref. 16:p. 26].

The procedure for initializing new construction ships into SCLSIS varies. For the FFG-7 Class, the ships were initialized after they were built. The shipbuilder and SPCC worked with the CDM, Long Beach Naval Shipyard, to ensure the accuracy of the data the CDM loaded into SCLSIS. For ships currently under construction such as the DDG-51, the shipbuilder can input directly to the SCLSIS database via ROMIS.

2. **ROMIS**

ROMIS is the Navy's newest management tool for documenting configuration data and tracking provisioning and allowance preparation. ROMIS is maintained by the shipbuilders on personal computers at the shipyards [Ref. 12:p. 26]. This allows real time on-site database updating.

If ROMIS is invoked in the contract, the shipbuilder can directly update the SCLSIS database and the WSF via tape. In addition, the shipbuilder can be designated as the CDM or can feed the data directly to the appropriate activity.

One desirable attribute of ROMIS is that it allows technical drawings and piece part information to be tied to configuration records. In addition, ROMIS has a material management function that automates certain segments of the ordering and material management functions for the Naval Supervising Agent (NSA).

3. **FOMIS**

FOMIS is the integrated management system that was the predecessor to ROMIS. FOMIS also provides an automated format for tracking the configuration of new construction ships but it tracks the progress and status of installed equipment at the APL/AEL level [Ref 2:p. 18].

One of the biggest drawbacks to FOMIS is the increased administrative burdens it causes. FOMIS is updated monthly and reports have to be requested from SPCC. By the time the information is received, it is often stale and must be validated [Ref. 12:p. 26]. FOMIS cannot provide V09 tapes to SCLSIS so a lot of useful information, such as drawing numbers, must be reconstructed by the CDM [Ref 17].

C. ALLOWANCE PREPARATION

1. Coordinated Shipboard Allowance List (COSAL)

The goal of provisioning and configuration management is to build the allowance documents that establish stocks of retail-consumer inventory on ships. The allowance list tells the ship what material, and what quantity of that material, it is allowed to carry. The information on the APLs/AELs form the foundation of the COSAL.

The COSAL is both a supply and a technical document. As a supply document, it contains a list of parts and allowance quantities and provides cross references to permit identification of stock numbers. It's a technical document because it provides a description of nomenclature, operating characteristics, and technical manuals. In short, the COSAL is the bridge between the manufacturer's part number and the stock number recognized by the system [Ref. 15:p. 10].

2. COSAL Computation Techniques

There are six computational models that calculate the range and depth of material in a COSAL. Of the six, three are used in special situations and will not be discussed. The three that reflect the current methods at SPCC are:

1. Modified Fleet Logistic Support Improvement Program (MOD-FLSIP) Allowance Model. A modified version of the FLSIP model used in the 1970s, the MOD-FLSIP model increases the insurance stockage of certain items in the COSAL.

2. Maintenance Criticality Oriented (MCO) Allowance Model. Used on FFG-36 through FFG-59.

3. TRIDENT Allowance Model. Used for material specific to TRIDENT Class SSBN submarines.

a. MOD-FLSIP

The primary allowance concept in use today is the Fleet Logistics Support Improvement Program (FLSIP). In the FLSIP, each item (NSN) on an APL is a candidate for stocking. The FLSIP computation asks three questions in determining the allowances [Ref 18]. First, can the ship remove and replace the item? Second, what is the number of equipments aboard? Third, what is the Best Replacement Factor (BRF) (usage data) of the NSN?

If the item is in one or more pieces of equipment and can be removed and replaced at sea, then the item meets the "range cut". All range cuts are then further subjected to the FLSIP algorithm to determine if they qualify for stocking.

If the item has an expected demand of one in 90 days, then the item is stocked as a demand based item. If the item has a demand greater than one in every four years, the item is stocked as an insurance item. Additionally, there are a large number of items that are stocked as safety items and for planned maintenance requirements.

The MOD-FLSIP procedure is exactly the same as the FLSIP except it expands the number of insurance items and doubles their depth [Ref 15:p. 13]. If an item on a primary piece of equipment has a demand of one in ten years, the item is stocked. For insurance items with a demand of at least two but less than four, the depth is increased to two from one.

The MOD-FLSIP translates to an increase of 25% in the number of line items carried over the FLSIP model. This also equates to a 37% price increase in the cost of a ship's storeroom items [Ref 15:p. 13].

b. MCO

The MCO COSAL was applied to only the fourth flight of the FFG-7s. It is included in this discussion because the thesis uses a large body of data for these ships.

The philosophy behind the MCO COSAL was to increase the number of "critical" spares while staying within the cost of a FLSIP COSAL. To do this, all equipments were rated as to their criticality in completing the ship's missions. The higher the Mission Criticality Code (MCC), the more emphasis the equipment received. Using the same algorithm as the TRIDENT model, the MCO was developed to emphasize critical equipments [Ref 15:p. 14].

c. TRIDENT Allowance Model.

This model is used to compute allowance quantities for TRIDENT SSBN submarines. It provides variable protection level based on unit price and Fleet Ballistic Missile (FBM) Military Essentiality Codes (MEC) [Ref 15:p. 10]. As with the MCO, the emphasis is on providing on board support for critical equipments.

3. **Incremental Stock Number Sequence List (ISNSL)**

ISNSLs are a series of lists which contain the computed depth and range of storeroom items at certain points during the ship's construction [Ref. 13:p. 5]. The objective is to facilitate the efficient procurement of Government and Contractor Furnished Material [Ref. 2:p. 22].

ISNSLs are extracted on scheduled intervals based on the completed configuration records resident in the WSF Level A and any processed PTD packages [Ref. 12:p. 27]. In addition to the identified ship's allowances, the ISNSL also breaks down the items by Government and contractor procurement responsibilities.

D. OUTFITTING

Outfitting entails ordering, funding, expediting, follow-up, and receipt of material identified by allowance lists [Ref 13:p. 4]. The outfitting process begins at the time material

requirements are identified [Ref 2:p. 23]. The first step is allowance list processing.

The Naval Supervising Activity (NSA) is the focal point for processing the allowance lists. After carefully reviewing the ISNSLs produced by SPCC, the NSA sorts the requirements. Some of the requirements are passed to the shipbuilder as Contractor Furnished Material (CFM) while others go to the Outfit Supply Activity (OSA) as Government Furnished Material (GFM).

The OSA is the activity that procures all GFM specified in the allowance lists. Their tasks are to:

1. Introduce Government furnished requisitions into the supply system.
2. Control and account for SCN funds.
3. Provide requisition and material status for all items.
4. Expedite as necessary [Ref 2:p. 24].

Before the NSA passes the requisitions to the OSA, GF requirements are screened against excess assets available in the SCN Consolidated Residual Asset Management Program (SCRAMP) [Ref 12:p. 34]. SCRAMP is an excess SCN material program funded by NAVSEA and operated by the Fitting Out and Supply Support Assistance Center (FOSSAC).

Once all material is on order, management attention at the NSA turns towards monitoring and expediting requisition

status. Again, the goal is to have 97% of the outfitting material on board prior to sail away.

E. FITTING OUT

According to Masters, fitting out is a subset of outfitting [Ref. 2:p. 24]. Fitting out refers to placing the received material in bins on board the ships. Although MIL-STD-1339B uses the terms interchangeably, it is more appropriate to consider fitting out the end product of outfitting as this is when the ship's crew assumes responsibility for the material [Ref. 19:p. 9].

IV. CONSIDERATIONS IN TRANSFERRING DEFENSE LOGISTICS AGENCY (DLA) CONTRACTOR FURNISHED MATERIAL (CFM) TO GOVERNMENT FURNISHED MATERIAL (GFM)

The original intent of this thesis was to analyze the cost differences between CFM and GFM. However, during almost every interview conducted, the cost differences between CFM and GFM were not an issue. The real concerns were availability of material, the budgetary implications, and contractual changes required to facilitate the transfer.

To address the full economic and political impact of making the transfer from CFM to GFM, each of the these areas are discussed. However, a caveat must be interjected at this point. As noted in the New Construction Streamlining Study, each shipbuilding program is a compilation of different contractual clauses, requirements, and even philosophies [Ref. 12:p. 3]. As a result, there are a variety of different variables that must be considered for each individual program contemplating transferring CFM to GFM. To describe each variable and the required actions before the transfer process can occur is beyond the scope of this thesis. Rather, this chapter will demonstrate that if a Ship Program Manager (SPM) is interested in studying the transfer option, there is historical data to support that move. This chapter will also

discuss possible pitfalls that may confront the SPM and solutions that have been found to avoid them.

A. AVAILABILITY OF MATERIAL

The availability of material for both outfitting new construction ships and supporting operating ships was, and is, the principle concern of everyone in the outfitting field. People tend to use the availability of material to support their particular point of view in defending or opposing the transfer from CFM to GFM. In addition, the availability of material might involve costs that have to be included when doing later cost analyses.

To address this issue, the findings of the FFG-7 and the OHIO Class Submarine studies along with data from the USS SUPPLY (AOE-6), will be analyzed. Then, procedures and problems affecting availability discussed during interviews with DLA, SPCC, and Program Management personnel will be presented. Finally, cost considerations that would result from changing current procedures to ensure availability are addressed.

1. FFG-7 Test Program Results

As already noted, a test program was initiated that transferred all DLA material from CFM to GFM for FFGs 54 and 57. Going into the test program, availability was one of the

primary concerns. Because of this, the Ship Acquisition Project Manager (SHAPM), PMS 399, tracked outfitting percentages very carefully [Ref. 1]. [1]

There were three questions the test program was interested in answering [Ref. 1]. The first was whether outfitting goals for DLA material could be reached. The second was whether the "Churn" in the Incremental Stock Number Sequence List (ISNSL) process would result in the procurement of excess material. "Churn" occurs when subsequent ISNSLs modify the range and depth of stocked material. The third was whether deletion of the NSN material would leave the shipbuilder with the most difficult material to obtain and jeopardize the outfitting readiness goals.

The conclusions of the test program regarding availability were:

1. Converting DLA managed items from CFM to GFM and requisitioning through the Federal Supply System (FSS) was successful and did not inhibit reaching the outfitting readiness goals.

2. The pilot tests showed the "Fill or Kill" technique would not have to be used for DLA managed material because DLA was responsive even in a backorder situation.

3. The residual CFM items left for the commercial shipbuilder to procure, which were originally thought to be the most difficult and which could possibly impact the

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[1]. In 1988, NAVSEA changed the designation of program offices that managed new ship construction from "SHAPM" to "SPM".

shipbuilder's ability to reach the outfitting readiness goals, proved not to be a problem. [Ref. 1]

Table 1 provides the statistics for the transferred DLA cognizance material for the FFG-54 and the FFG-57 [Ref 20]. As can be seen, the percent received was 99.4 for the FFG-54 and 98.9% for FFG-57, well above OPNAV's required 97%.

TABLE 1

CFM TO GFM CONVERSION
FOR DLA COG MATERIAL

CATEGORY	FFG-54	FFG-57
LINE ITEMS RECEIVED	5292	5327
BACKORDERED	0	43
REFERRED	0	11
REJECTED	3	0
PURCHASED	22	6
NO STATUS	5	0
TOTAL ITEMS REQUISITIONED	5322	5387
% RECEIVED	99.4%	98.9%

Based on these results, PMS 399 implemented the CFM to GFM transfer for FFGs 56 and 58 - 61. Figure 4 provides the final outfitting percentages for all material, both CFM and

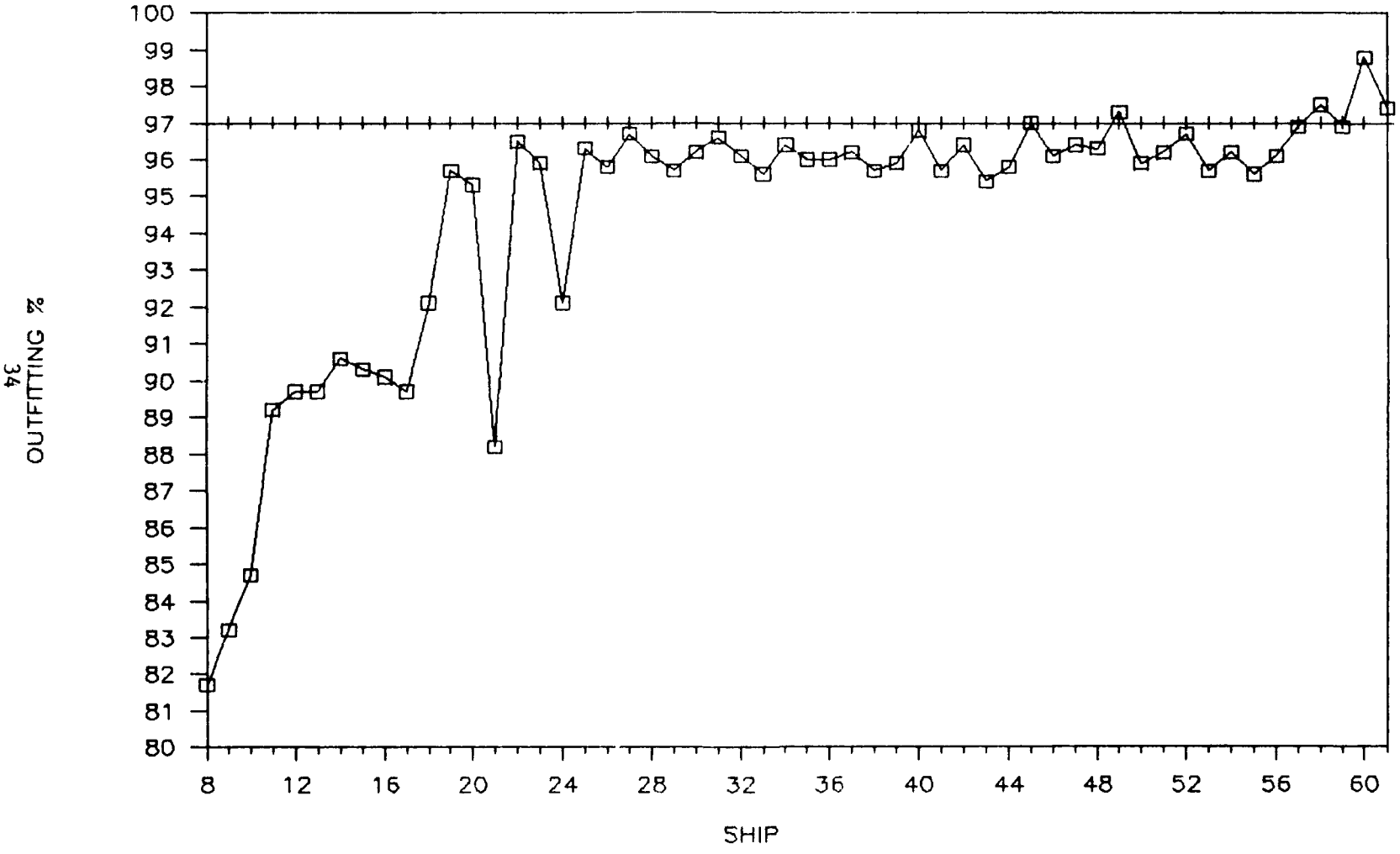

Figure 4. FFG-7 Class Material Outfitting Status

GFM, for all FFG-7s.[2] As can be seen from Figure 4, the final percentages for the fourth flight of ships were as good if not better than the percentages for ships before the transfer. In fact, the transfer actually improved the final percentages for the fourth flight [Ref. 20].

2. OHIO Class Submarine Study

The procedure used by PMS 396 to designate items for transfer from CFM to GFM was different than PMS 399's. Rather than transferring all DLA material from CFM to GFM, PMS 396 opted to transfer an item only if the FSS had the DLA items in stock [Ref. 21]. SPCC conducted the review to determine eligibility. If an item was in stock, the NSA was tasked with procuring it [Ref. 11:p. 2]. If not, the shipbuilder was responsible for obtaining it.

Prior to this study, PMS 396 had been concerned with the poor performance of the shipbuilder in providing CFM on the SSBN 734 [Ref. 22]. CFM availability at SSBN 734 delivery was only 95.9%, well below the acceptable 97% [Ref. 23]. In fact, the Government had to obtain 1.4% of the 95.9% to assist the shipbuilder. As a result, PMS 396 and the shipbuilder

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[2] The values for the FFG-54 and 57 in Figure 4 differ from those in Table 1. Figure 4 represents the final percentages for all outfitting material while Table 1 is just DLA GFM.

applied significant management attention to alleviate the problem with only minimal success [Ref. 23].

Based on the results of their CFM initial outfitting study on SSBN 735 and the FFG-7 program's results, PMS 396 has made contractual changes to transfer qualifying DLA items from CFM to GFM for SSBNs 740-742 [Ref. 22]. To validate results of the policy change, PMS 396 will be tracking material availability closely throughout construction of these submarines.

3. **USS SUPPLY (AOE-6)**

The Naval Supervising Activity (NSA) for the USS SUPPLY (AOE-6) is Superintendent of Shipbuilding, Conversion and Repair (SUPSHIP), San Diego. SUPSHIP San Diego is using a third procedure to identify items to transfer from CFM to GFM. SUPSHIP personnel review the allowance data on Contractor Furnished DLA items for the cost of each item. All items under $100.00 are automatically transferred to GFM. The NSA has processed up through the sixth incremental and has transferred 8539 items from CFM to GFM [Ref. 24]. Of these requisitions, 7107 (83%) have been received. Since the AOE-6 is still 14 months from delivery, the NSA is confident that all FSS requisitioned material will be on-hand [Ref. 24].

The NSA has identified approximately 2000 items, with an estimated value of $1.5 M, for the shipbuilder to procure.

Of this number, the shipbuilder has returned 28 items to NSA responsibility because their bid price was too high compared to the FSS's price. Table 2 lists those 28 items and their price differences.

TABLE 2

FSS VS CONTRACTOR BID PRICE
USS SUPPLY (AOE-6)

NIIN	QTY	FSS PRICE	BID PRICE	NIIN	QTY	FSS PRICE	BID PRICE
006137245	1	$5720.00	$17153.00	000876637	1	$353.77	$6001.91
008369905	1	$152.10	$619.00	004501604	1	$976.00	$2241.60
008420520	1	$381.00	$1125.00	004998098	1	$391.00	$1100.00
010189471	4	$141.30	$334.50	005480481	1	$430.50	$1373.00
010192736	4	$11.74	$573.15	006562881	1	$440.83	$1791.38
010325605	1	$681.50	$2310.94	005759297	3	$948.00	$1882.82
010418307	1	$926.40	$1632.00	006011039	1	$1160.00	$2015.69
010489894	1	$1800.00	$2831.46	006011236	1	$2160.00	$6724.25
011194682	1	$682.00	$1449.58	006011279	8	$2420.00	$5031.00
011212567	1	$383.00	$1000.00	006011317	24	$1330.00	$4463.00
011219701	1	$2017.40	$6661.20	006011423	1	$616.00	$1284.00
011224358	1	$632.48	$2284.59	006026779	4	$1930.00	$4318.00
011670030	1	$162.95	$500.00	006026786	1	$1590.00	$3281.20
011751106	1	$140.80	$1120.00	006026815	1	$2160.00	$5723.90

The information in this table is an example of the extreme material price differences that can occur between the

FSS and the commercial market. The total cost of the FSS was $7840.80 while the total bid prices from the product's vendors was $86,753.67, a price mark-up of over 1,100%.

4. Availability Problems

One consideration should be noted when discussing the above programs. In addition to stock procured to meet the inventory levels required by Ship Selected Records (SSR), DLA builds inventory levels on demand data from operational units plus a "fudge factor" [Ref. 25]. The additional buildup in inventory levels from demand data plus the "fudge factor" has allowed the FFG-7, the OHIO Class Submarine, and the AOE-6 programs to draw material from the FSS for outfitting without effecting Fleet requirements.

For a new program that is building it's first ships, DLA won't have the benefit of operational demand to drive up inventory levels. This could present a problem if outfitting requirements aren't identified during the early stages of a program.

Interviews with both SPCC and DLA personnel confirm new programs could be a problem. The DLA representative feels that new programs, and the first year of demands after the transfer in a mature program, could be a problem until DLA procures more inventory [Ref. 25].

The required communication between the Navy and DLA is an issue that must be addressed. One of the major concerns at SPCC is that the SSR and Ship Provisioning Requests (SPR) process generates inventory stock but does not generate any buys for material to be used in outfitting [Ref. 26]. Currently, to provide a build up of inventory from the SSR process, DLA requires that a SSR contain an anticipated demand of five for each item [Ref. 27].

Although the system has supported transferring CFM to GFM without formal communications, both DLA and SPCC feel the planning process needs to be modified. Representatives at DLA believe a process agreed to by both parties needs to be developed because they are reluctant to buy material in anticipation of sales [Ref. 28]. With appropriate planning data, DLA does not anticipate any problems if they could be brought into picture early [Ref. 25]. They would require the following information:

1. Range and depth of material
2. When requisitions would begin
3. Production schedules

Even if DLA received prior planning information, and was able to stock up early in the shipbuilding program, problems might occur with the lead ship. Since the last

incremental, which occurs just six months before delivery, contains 20% of the configuration, material might not be available [Ref. 27]. However, DLA statistics show that their requisition response time for new material is less than ninety days. Thus, a six month lead time should be sufficient to provide the material to the NSA [Ref. 25].

5. **Manpower Concerns**

In terms of workload, DLA does not feel that the increased demand caused by transferring CFM to GFM would have an impact on their operation [Ref. 28]. Since they handle over 3,000,000 requisitions a year, the possible increase of 60,000 requisitions would not make an significant impact. Funding to cover the costs of receiving, storing, transporting, and administration is covered in their surcharge. This is included in the price of the item [Ref. 28].

SPCC personnel, on the other hand, feel that they do not have the manpower to process the additional SSRs that will be generated to increase GFM inventory levels at DLA [Ref. 27]. Also, changing the incremental processing system to accommodate the CFM to GFM transfer would require the addition of a second person [Ref. 27]. Therefore, a total of two individuals at the GS-11 level would be required at SPCC if

all shipbuilding programs were to adopt the CFM to GFM procedure.

Both the FFG-7 [Ref 20] and the OHIO Class Submarine [Ref 21] programs found that the impact on the OSA was not significant. No additional manpower requirements were required for either program.

6. **Conclusions**

Shipbuilding programs that have opted to transfer CFM to GFM have not encountered the shortage problems that many thought would occur. In fact, the results are just the opposite. The FSS was shown to be more responsive than the shipbuilder in the FFG-7 program and has so far supported the AOE-6 program well. More importantly, operational units have not suffered [Ref. 20].

This not to say that all shipbuilding programs should be automatically transferred to GFM without first exploring the concerns expressed above. In addition, budgetary and contractual issues must be considered.

B. BUDGETARY IMPACT

Funding for procurement of both CFM and GFM is part of the Five Year Defense Plan (FYDP) under the Shipbuilding and Conversion, Navy, (SCN) appropriation line . The SPMs use two different accounts for the procurement of material. The

first, the SCN End Item Account, is managed by the SPM and is provided to the shipbuilder to use in buying all CFM. The second, the SCN Outfitting Account, is managed by NAVSEA 04MS for buying GFM. NAVSEA 04MS sends funding documents to the OSA when notified that a NSA has submitted requisitions for GFM.

Since the outfitting funds are in separate accounts, the funds cannot be mixed. SCN End Item funds cannot be transferred to SEA 04MS for GFM purchases and SCN Outfitting Account funds cannot be given to the shipbuilder for CFM. [Ref. 29]. The division of outfitting funds into the two SCN accounts is a potential problem for the SPM who is interested in transferring CFM to GFM.

Program managers have gotten around this constraint in various ways. The FFG-7 program had enough flexibility in the SCN Outfitting Account to absorb the additional increases in GFM for all their FFG-7s [Ref. 30]. The dollar value of the 8539 items transferred for the AOE-6 has been so insignificant that the NSA has been able to absorb it in their SCN Outfitting Account [Ref. 24].

PMS 396 plans on providing SCN End Item funds into their outfitting account at the OSA to cover the increase caused by the transfer for CFM to GFM [Ref. 29]. PMS 396 has expressed a note of caution about their methodology. It leaves a

significant amount of money unobligated for a extended period while waiting for the incremental to be processed. This delay could leave the money visible to the Office of the Comptroller of the Navy (NAVCOMPT) and therefore it runs the risk of being taken away. PMS 396 must be more vigilant than usual to ensure this doesn't happen [Ref. 29].

C. CONTRACT MODIFICATIONS

Shipbuilding contracts let at NAVSEA contain a "changes clause" that allows the SPM to modify the contract either unilaterally, by direction of the Government, or bilaterally by agreement between the contractor and the Government [Ref. 2:p. 58]. The transfer of CFM to GFM could take place as either.

In the FFG-7 program, a contract modification was not required as the Government just modified the list of items that it required the shipbuilder to buy [Ref. 20]. The OHIO Class Submarine program was in the process of letting new contracts for SSBNs 740-742 when they decided to make the transfer from CFM to GFM. They modified the contract to include an unpriced Contract Line Item Number (CLIN) that directed the shipbuilder to buy CFM only when told to do so and after they had received the funding [Ref. 22]. The AOE-6 program has stayed within the current limits of their contract

and it has not been modified [Ref. 24]. NAVSEA PMS 400, the SPM for DDG-51, feels that it is within the limits of MIL-STD 1339B for them to tell the shipbuilder what to buy, so a contract modification is not required [Ref. 31].

V. COST ANALYSIS

As was discussed in Chapter IV, the FFG-7, OHIO Class Submarine and the AOE-6 programs have transferred all or portions of their CFM to GFM. This chapter will analyze the differences in costs that would occur in the programs if the material were obtained using each of the three alternatives. The first section of the chapter will provide a background on the Cost Analysis studies and the final section will compare the three programs to demonstrate the costs of the alternatives.

A. COST ANALYSIS BACKGROUND

In today's fiscal environment, and as guardians of the public trust, no Program Manager (PM) can afford to spend money unwisely. It is incumbent upon Government personnel to evaluate all possible options when procuring material and choose the procedure that makes the most economic sense.

In order to determine the best approach, the PM needs to rely on special tools to assist in making the hard decisions. One of those tools is Cost Benefit Analysis (CBA).

CBA helps policy makers with decisions concerning the most productive use of their resources. CBA is a "tool for

systematically developing useful information about the desirable and undesirable effects of a public sector program." [Ref. 32:p. 1]

As traditionally done, CBAs are concerned with welfare economics which provide the potential costs and benefits of a project. However, as is often the case with the military, programs are decided upon before hand and the only question that remains is what is the most cost effective way of completing the project. This type of CBA is known as a Cost-Effectiveness Analysis (CEA).

A CEA is "any analytic study designed to assist a decision-maker in identifying a preferred choice among possible alternatives." [Ref. 33:p. 1] A CEA addresses the problem of maximizing effectiveness subject to a constraint measured in terms of a budget [Ref. 34:p. 18]. It is appropriate when:

> 1) there is no market evaluation of alternative outputs, as in the defense sector and 2) the resource inputs can be appropriately evaluated at market prices [Ref. 34:p. 18].

Steiss [Ref. 35:p. 105] further refines the definition of CEAs by stating that "the actual impact of resource commitments in terms of program performance represents effectiveness." Blanchard notes that one use of CEAs involves evaluating two alternative systems using logistics factors [Ref. 36:p. 159].

An argument can effectively be made that the CFM outfitting question poised by this thesis is a CEA. The primary question being poised is which alternative is the most cost advantageous to the government. Since the three proposals have the same benefits, the main thrust of the thesis is to determine the one with the lowest costs. This approach coincides with the definition of a cost effectiveness analysis as presented by Anthony and Young [Ref. 37:p. 315]. The following factors help substantiate this position:

1. The decision to build the ships with the subsequent requirement of CFM has already been made.
2. The same amount of material must be acquired regardless of the alternative chosen, thus all benefits are the same.
3. The cost elements determining final costs are not the same across the three alternatives.

The cost estimates will be developed within the framework of cost-element lists which are subdivisions of cost categories [Ref. 38:p. 84]. All costs associated with the three alternatives that have been identified through interviews and research are included. Cost estimates of each the alternatives can then be derived through calculations of the various cost elements.

Since the data obtained is not just from one single year or program, it will need to be adjusted for inflation or

discounted depending on the situation. The inflation rates in Table 3 are used to express costs in a common year's dollars. They were obtained from the Office of the Comptroller, Navy (NAVCOMPT), and are used during the normal yearly budget process [Ref. 39]. [3]If any numbers have to be discounted, the discount rate will be 10%, the standard rate as published by OMB Circular A - 76 [Ref. 40].

TABLE 3

PRICE INFLATION/ESCALATION ANNUAL RATES

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89
67.08%	69.84%	72.17%	74.53%	77.12%	79.98%	83.10%	86.41%	89.79%

FY 90	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
93.21%	96.59%	100.00%	103.46%	106.99%	110.63%	114.39%	118.28%

The table format used in this thesis is the same as NAVSEA PMS 396 developed during the OHIO Class Submarine Study. However, the tables and the contents have been modified to reflect the changes in the focus of this study.

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[3] The inflation rates used were developed for the SCN account using a current year basket of goods as the basis for the index. Basing the index on the current year will provide a conservative figure that will understate the effect of inflation. These rates were chosen because of their direct application to ship construction.

B. OHIO CLASS SUBMARINE STUDY

The OHIO Class Submarine study methodology consisted of:

1. Determining the amount of excess material in the FSS and the cost.
2. Identifying the shipbuilder's cost for the same material.
3. Calculating any additional FSS costs incurred.
4. Estimating additional costs for other activities (such as SPCC's).
5. Presenting the costs by alternative. [Ref. 11:p. 3-6]

Each of PMS 396's alternatives will be discussed along with an explanation of how the numbers were derived. If it is necessary to modify PMS 396's numbers, the change will be noted and the rational for doing so provided.

1. ALTERNATIVE 1 - CFM PROCURED COMMERCIALLY

a. Material Identification

PMS 396 requested SPCC's help in determining the amount of excess material in the FSS that would qualify for transfer from CFM to GFM. PMS 396's request included both Navy cognizance and DLA cognizance items. For purposes of this study, the DLA items are separated out and analyzed by themselves.

SPCC originally identified 5,952 CFM allowance items that were available in the FSS [Ref. 11:p. 6]. Of these items, 5,462 were DLA cognizance material. From the 5,462, a

representative sample of 1,777 DLA items (32.5%) were chosen at random for inclusion in PMS 396's study.

b. Shipbuilder's Cost

Once the 1,777 candidates were chosen, the NSA, SUPSHIP Groton, obtained the shipbuilder's commercial cost for each item. The cost estimate provided in 1986 was $380,636.39 [Ref. 11:p. 8]. Since the other figures included in the study were calculated in 1989 dollars, the shipbuilder's material cost has been adjusted for inflation to more accurately reflect it's value three years later. The adjusted material cost is $419.210.45.

The shipbuilder used a material vendor procurement agent to procure and stage a significant portion of the material. In addition to the agent's material cost, there was also a $85.00 per line item charge. The agent then totaled the material cost and the line item charge and calculated a 6% profit fee. In addition to the agent's fees, the shipbuilder charged $30.00 per line item for **all** line items, plus a .168% General and Administrative (G&A) fee on **all** costs and a 15.2% profit fee on the **total** material cost and agent's fees [Ref. 11:p. 7].

The agent was able to provide all 1,777 DLA items. Thus, the total material cost for the DLA items can be used in calculating the appropriate fees [Ref. 41]. This point is

highlighted because in PMS 396's study, the agent was unable to obtain 30 items which affected the calculation of fees. It was therefore necessary to manipulate the material cost when the fees were determined. Table 4 provides the shipbuilder's cost for the 1,777 sample items.

TABLE 4

CFM COMMERCIALLY PROCURED

MATERIAL COST	$419,210.45
VENDOR PROCUREMENT AGENT FEES	
* Charge per item	$151,045.00
* Fee	$18,125.40
TOTAL	$169,170.40
SHIPBUILDER ASSOCIATED FEES	
* Charge per item	$53,310.00
* G & A	$1,078.04
* Fee	$89,433.89
TOTAL	$143,821.93
CFM TOTAL COST	$732,202.78

Once the sample costs were determined, the cost for the 5,462 line items needed to be calculated. PMS 396 determined that the FSS cost of the 1,777 sample items in 1989 was $322,422.48. Since the non-adjusted shipbuilder material

cost was $380,636.39, the increased material cost of the commercially provided items over the FSS was $58,213.91 or 15.29% However, using the adjusted material cost of $419,210.45, the difference between the FSS and the shipbuilder's commercial cost was 96,787.97, or 23.08%.

Using this information, the shipbuilder's cost of all 5,462 line items can be extrapolated by multiplying the FSS cost of all the line items by 23.08%. The total FSS material cost of the 5,462 line items was $853,379.40 [Ref. 11:p. 8]. Multiplying this figure by 23.08% yielded an estimated commercial cost of $1,050,339.37. Adding the material cost to the agent's line item charge and then multiplying by the agent's profit fee of six percent gave the agent a fee of $90,876.56.

Once the material cost and the agent's charges were determined, the shipbuilders's G & A and fee were calculated for the 5,462 line items. Table 5 provides a total projected cost of $2,016,352.30 for all 5,462 line items if the CFM was commercially procured.

2. ALTERNATIVE 2 - CFM IS REQUISITIONED FROM THE FSS BY THE SHIPBUILDER

Navy contractor access to the FSS for DLA material has still not materialized. Before any shipbuilder is

TABLE 5

CFM PROCURED COMMERCIALLY TOTAL PROJECTED COST

MATERIAL COST	$1,050,339.37
VENDOR PROCUREMENT AGENT FEES	
* Charge per item	$464,270.00
* Fee	$90,876.56
TOTAL	$555,146.56
SHIPBUILDER ASSOCIATED FEES	
* Charge per item	$163,860.00
* G & A	$2,972.50
* Fee	$244,033.86
TOTAL	$410,866.36
CFM TOTAL COST	$2,016,352.30

authorized access, NAVSEA and NAVSUP must first negotiate the process with DLA. If this option had been available, the shipbuilder indicated that a procuring agent would not have been used [Ref. 11:p. 10].

The cost to process a requisition in the FSS in 1989 was $12.00 per requisition for handling, storage, and material issue [Ref. 11:p. 12]. Additional costs also have to be factored in for SPCC and the NSA. The cost was $2,414.00 for SPCC to perform the prescreening of the ISNSLs [Ref.11:p. 12]. As noted in Chapter IV, SPCC would require an additional two

GS-11 level people for tracking the status of material at a total cost of $80,000.00.

For the NSA to review, validate, and follow-up on shipbuilder requisitions, they forecasted an increase of $11,785.00 per year for manpower requirements. Table 6 provides the totals for Alternative 2.

TABLE 6

CFM REQUISITIONED FROM THE FSS
BY THE SHIPBUILDER

	1,777 SAMPLE ITEMS AVAILABLE	5,462 ITEMS AVAILABLE
MATERIAL COST	$322,422.48	$853,379.40
FSS REQUISITION COST	$21,324.00	$65,544.00
NSA		$11,785.00
SPCC COSTS		$82,414.00
SHIPBUILDER ASSOCIATED FEES		
* Charge per item	$53,310.00	$163,860.00
* G & A	$631.23	$1,708.96
* Fee	$57,111.34	$154,620.39
CFM TOTAL COST	$454,799.05	$1,333,311.75

3. ALTERNATIVE 3 - CFM REQUISITIONED FROM THE FSS BY THE GOVERNMENT

The third alternative determines the cost of the DLA material if the Government requisitioned it through normal supply channels. The cost of the material and requisition processing charges are the same as Alternative 2. The obvious difference is that there are no shipbuilder costs.

A new factor must be considered at this point. As noted earlier, the NSA is responsible for submitting the requisitions to the system. In addition, they must also track and expedite the requisitions. The NSA, SUPSHIP Groton, considers this to be a manpower intensive situation and estimated it would require an increase of 3.75 manyears with a cost of $81,721.00 [Ref. 11:p. 12].

Table 7 represents the cost of the Government using the FSS. The costs of the sample items are listed first, then the projected costs of the entire list of items.

4. COMPARISONS

The previous sections have demonstrated the costs under each alternative. The total projected cost of the alternatives can now be compared to determine if one of the alternatives is more cost effective. Table 8 is compilation of the data from Tables 5,6, and 7.

TABLE 7

CFM REQUISITIONED BY THE GOVERNMENT

	1,871 SAMPLE ITEMS AVAILABLE	5,952 TOTAL ITEMS AVAILABLE
MATERIAL COST	$322,422.48	$853,379.40
FSS REQUISITION COST	$21,324.00	$65,544.00
NSA MANPOWER COSTS	N/A	$81,721.00
SPCC COSTS	N/A	$82,414.00
TOTAL COST	$343,746.48	$1,083,058.40

TABLE 8

CFM COST COMPARISON

	ALTERNATIVE 1 SHIPBUILDER COMMERCIAL	ALTERNATIVE 2 SHIPBUILDER FSS	ALTERNATIVE 3 GOVERNMENT FSS
MATERIAL COST	$1,050,339.37	$853,379.40	$853,379.40
VENDOR PROCUREMENT AGENT FEES			
Charge per item	$464,270.00	$0.00	$0.00
Fee	$90,876.56	$0.00	$0.00
AGENT TOTAL	$555,146.56	$0.00	$0.00
FSS REQUISITION HANDLING COST	N/A	$65,544.00	$65,544.00
SHIPBUILDER ASSOCIATED FEES			
Charge per item	$163,860.00	$163,860.00	$0.00
G & A	$2,972.50	$1,708.96	$0.00
Fee	$244,033.86	$154,620.39	$0.00
SHIPBUILDER TOTAL	$410,866.36	$320,189.35	
NSA MANPOWER COSTS	N/A	$11,785.00	$81,721.00
SPCC COSTS	N/A	$82,414.00	$82,414.00
CFM TOTAL COST	$2,016,352.29	$1,333,311.75	$1,083,058.40

Alternative 1, the shipbuilder procuring the material commercially, is the most expensive option at $2,016,352.29. Alternative 2 eliminates the vendor procurement agent and reduces the cost to $683,040.54. Alternative 3 is $933,293.89, or 46.29%, less expensive than Alternative 1 and $250,253.35, or 18.77%, less than Alternative 2.

The results here coincide closely with the PMS 396's despite the additional costs included in this analysis. PMS 396 determined a cost savings of 41.7% for Alternative 3 over Alternative 1 and a savings of 17.97% of Alterative 3 over Alternative 2 [Ref. 11:p. 11].

Despite the additional costs, Alternative 3 is still significantly more cost effective than Alternatives 1 and 2. Because of the difficulties in providing the shipbuilder access to DLA assets, Alternatives 1 and 3 are the only viable avenues open to the PM. Based on a comparison of costs, Alternative 3 makes the most economic sense.

C. FFG-7

The USS INGRAHAM (FFG-61) was delivered to the Navy on 07 July, 1989. During the ten year construction program, the Program Office at NAVSEA was constantly striving to find ways to reduce costs. As early as 1976, the gross disparity in prices between what the shipbuilder charged and the cost in

the FSS prompted NAVSEA PMS 399 personnel to begin searching for a better system. The first step in their investigation was to request pricing data for DLA items from one of the shipbuilders, Bath Iron Works (BIW), Bath, MA. BIW reported that their prices were an estimated 200-400 percent over the FSS's [Ref. 42:p. 1].

The combination of this price escalation and the GAO reports discussed in Chapter II led PMS 399 to initiate the test program on FFGs 54 and 57. Although PMS 399 did not perform an extensive cost analyze like PMS 396, they had enough information after testing the CFM to GFM transfer process to support their decision to transfer all CFM to GFM for the DLA material in the fourth flight of ships [Ref. 43].

This section details the results of what analysis was done after implementation of the PMS 399 decision. Comparison of the cost savings between the shipbuilder's costs (Alternative 1) and the FSS's cost (Alternative 3) verify the validity of PMS 399's decision.

Table 9 presents a limited sample of items where prices were compared. The three shipbuilders, TODD Shipyards Corporation San Pedro, TODD Shipyards Corporation Seattle, and BIW, that constructed the FFG-7s all provided their material costs. The cost for their overhead and the procuring agents

overheads were not included. Those costs ran $50.00 to $100.00 per item depending on the shipbuilder [Ref. 43].

The shipbuilder's price was higher than the FSS's except in five cases. The shipbuilder's prices ranged from 100% to

TABLE 9

COST SAMPLE OF

MATERIAL IDENTIFIED TO NSNs

NSN	NOMENCLATURE	U/I	QTY	UNIT PRICE	EXT PRICE	TODD SP	TODD SEATTLE	BIW
9Q 5140-00-369-4927	BOX, TOOL	EA	2	43.36	86.72	54.85	61.24	41.08
9G 6240-01-134-6985	LAMP, INCAND	EA	12	15.00	180.00	7.50	2.74	2.25
9N 5905-00-114-5393	RESISTOR	EA	1	0.05	0.05	1.25	1.25	0.10
9Z 5320-00-254-4131	RIVET	HD	1	4.70	4.70	18.40	18.40	4.35
9Z 5360-01-092-0065	SPRING	EA	1	1.12	1.12	33.25	33.25	15.40
9Z 5310-00-933-8121	WASHER	HD	1	0.73	0.73	4.53	4.10	10.00

almost 3000% of the FSS's. If the minimum overhead cost is added in, a $1.12 spring, NSN 9Z 5360-01-092-0065, costs $83.25. A markup of 7433%.

Unfortunately, data is not available to demonstrate the differences between the three alternatives for the same ship as was done in the PMS 396 study. However, data is available to compare the total costs of two different ships that were outfitted using Alternatives 1 and 3.

The USS GARY (FFG-51) was delivered on 02 November, 1984, with all her DLA material being delivered by the shipbuilder. The USS REUBEN JAMES (FFG-57) was delivered on 13 February, 1987 and was one of the fourth flight ships for which PMS 399 transferred all DLA line items, approximately 5300, from CFM to GFM. The COSALs were both Mission Critically Oriented (MCO) and the HM&E sections of the two ships did not vary significantly [Ref. 44].

Table 10 provides the number of line items and the original cost of all the DLA material, including both CFM and GFM. Data was not available that would allow separating the CFM from GFM and determining the exact costs for each. However, once inflation is included, analysis of the numbers allows a fair comparison because the only variation in the outfitting of the ships was transferring CFM DLA material to GFM [Ref. 45].

The $999,174.62 difference between the inflated totals is the additional costs incurred as a result of using a vendor's procurement agent and the shipbuilder's added fees. Admittedly, a portion of this cost was the procurement cost of the Navy cognizance items for which the shipbuilder was responsible. In their test study, PMS 399 determined that over 85% of the material that was considered CFM was DLA

TABLE 10

COMPARISON OF DLA COGNIZANCE MATERIAL
ON THE FFG-51 AND FFG-59

	ALTERNATIVE 1 -COMMERCIAL- FFG-51 15,018 LINE ITEMS	ALTERNATIVE 3 -FSS- FFG-59 15,442 LINE ITEMS
MATERIAL COST	$2,653,185.00 (1984)	$1,744,695.00 (1987)
INFLATED MATERIAL COST (1989)	$3,083,478.16	$1,899,239.55
FSS REQUISITION COST (12 per requisition)	N/A	$185,064.00
NSA/SPCC COSTS	N/A	N/A
CFM TOTAL COST	3,083,478.16	$2,084,303.55

cognizance items [Ref. 46]. [4]Therefore, a rough estimate of the savings can be calculated by multiplying $999,174.61 by 85%. By transferring the 5300 DLA line items from CFM to GFM on the FFG-57, PMS 399 recognized a savings of approximately $849,298.42, or 27.54%.

At this point, it is appropriate to discuss the differences in labor costs between the PMS 396 and PMS 399

[4] PMS 396 established that the percent of DLA material that was CFM in their OHIO Class Submarine Study was 89% (Study:p. 5).

studies. PMS 399 did not increase manpower at SUPSHIP Long Beach, to process the additional workload of over 15,000 line items. In fact, SUPSHIP Long Beach, was also able to procure a significant number of CF items for the shipbuilder with the manpower they had [Ref. 20]. There were no additional SPCC costs as the task of categorizing the material as GFM or CFM fell to the NSA [Ref. 47].

D. USS SUPPLY (AOE-6)

The outfitting process on the AOE-6 is essentially a modified Alternative 3. To qualify for transfer from CFM to GFM, the DLA cognizance items must have an FSS price of less than $100.00. The $100.00 dividing line was chosen to limit the additional costs to the SCN Outfitting Account [Ref. 24].

SUPSHIP, San Diego, has not performed a detailed cost study on the differences between the shipbuilder's costs and the FSS's. One of the primary reasons, besides the cost of the study itself, is that the shipbuilder uses multiple item Purchase Orders (PO) to obtain material [Ref. 24]. Using multiple POs, the shipbuilder can obtain a number of items on one document. This makes the cost per line item difficult to determine.

The AOE-6 is still 14 months from delivery. Although there is no definitive data, the initial impression of

personnel at SUPSHIP, San Diego, is that they are saving a considerable amount of money. Further research needs to be conducted to determine if all DLA material should transfer vice just that under $100.00.

E. CONCLUSIONS

1. FFG-7/SSBN 735

Intuitively, it makes sense that the same item will cost more if the shipbuilder has to buy it than if it is supplied by the FSS. However, the hidden costs need to be ferreted out to determine the real cost advantages.

Table 11 lists the results of each of the alternatives for the FFG-7 and OHIO Class Submarine outfitting costs. It is easy to see that Alternative 3 is the least cost alternative for the Government. Comparing the two programs is difficult because of the difference in the number of line items and configurations between the classes. However, when compared on costs, both programs clearly demonstrate that using the FSS is more cost effective for the Government.

2. FUTURE PROCUREMENTS

Trying to anticipate the cost of anything is a chancy operation at best. Trying to predict the cost of material to the Navy is even tougher. However, since the purpose of this

TABLE 11

COST SAVINGS OF ALTERNATIVE 3 OVER ALTERNATIVE 1

	ALTERNATIVE 1	ALTERNATIVE 3	SAVINGS	PERCENT
SSBN 735	$2,016,352.29	$1,083,058.40	$933,293.89	46.29%
FFG-51/57	$3,083,478.16	$1,899,239.55	$849,298.42	27.54%

thesis is to give policy makers a tool with whi to make decisions, it is appropriate to present an educated guess as to the cost savings the Navy might realize from Alternative 3. Tables 12, 13, and 14 display the cost savings potential for the shipbuilding schedule from FY 91 to FY 97 for seven classes of ships [Ref 48]. To keep all calculations in this thesis consistent, the totals have been discounted to 1989. However, several points must be made about the numbers in these tables.

First, it should be noted that the number of CFM line items for each class of ship is not exact. Configurations change with such frequency that an accurate count that would apply to all ships in the class is impossible. In addition, current numbers for the ships were not available from SPCC except for the DDG-51 and TRIDENT Classes [Ref 49]. The line items for all other classes of ships were based on research done by Masters and include both Navy and DLA cognizance items in the CFM [Ref. 2:p. 34]. To compensate for potential

TABLE 12

THE NAVY'S FY 1991 - FY 1992
SHIPBUILDING PROGRAM
(DOLLARS IN THOUSANDS)
ALTERNATIVE 3 SAVINGS OVER ALTERNATIVE 1

NEW SHIPS	NUMBER OF CFM 9 COG LINE ITEMS PER SHIP	-ALTERNATIVE 1- SHIPBUILDER'S COMMERCIAL COST	-ALTERNATIVE 3- COST SAVINGS POSSIBLE BY USING THE FSS	* SHIPS BEING BUILT IN FY * SAVINGS x NUMBER OF SHIPS IN FY							TOTAL SAVINGS PER SHIP CLASS
				FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97	
TRIDENT	5462	$2,015	$933	1 $933							$933
CVN	25000	$9,225	$4,270					1 $4,270			$4,270
SSN-21	5000	$1,845	$854	1 $854	1 $854	1 $854	1 $854	1 $854	2 $1,708	1 $854	$6,832
DDG-51	6281	$2,318	$1,073	4 $4,291	5 $5,364	4 $4,291	3 $3,219	3 $3,219	4 $4,291	3 $3,219	$27,894
LSD-41	12000	$4,428	$2,050	1 $2,050	1 $2,050	1 $2,050					$6,149
AOE	11000	$4,059	$1,879		1 $1,879						$1,879
ARS	5500	$2,030	$939				1 $939		2 $1,879		$2,818
TOTAL SAVINGS PER FY				$8,128	$10,147	$7,195	$5,012	$8,343	$7,878	$4,073	$50,776
SAVINGS DISCOUNTED - 1989 (10%)				$6,717	$7,624	$4,914	$3,112	$4,709	$4,043	$1,900	$33,019

TABLE 13

THE NAVY'S FY 1991 - FY 1992
SHIPBUILDING PROGRAM

ALTERNATIVE 3 SAVINGS OVER ALTERNATIVE 1
(DOLLARS IN THOUSANDS)

(10% CFM REDUCTION)

NEW SHIPS	NUMBER OF CFM 9 COG LINE ITEMS PER SHIP	-ALTERNATIVE 1- SHIPBUILDER'S COMMERCIAL COST	-ALTERNATIVE 3- COST SAVINGS POSSIBLE BY USING THE FSS	* SHIPS BEING BUILT IN FY * SAVING x NUMBER OF SHIPS IN FY							TOTAL SAVINGS PER SHIP CLASS
				FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97	
TRIDENT	4916	$1,814	$840	1 $840							$840
CVN	22500	$8,303	$3,843					1 $3,843			$3,843
SSN-21	4500	$1,661	$769	1 $854	1 $854	1 $854	1 $854	1 $854	2 $1,708	1 $854	$6,832
DDG-51	5653	$2,086	$966	4 $4,291	5 $5,364	4 $4,291	3 $3,219	3 $3,219	4 $4,291	3 $3,219	$27,894
LSD-41	10800	$3,985	$1,845	1 $2,050	1 $2,050	1 $2,050					$6,149
AOE	9900	$3,653	$1,691		1 $1,691						$1,691
ARS	4950	$1,827	$846				1 $939		2 $1,879		$2,818
TOTAL SAVINGS PER FY				$8,035	$9,959	$7,195	$5,012	$7,916	$7,878	$4,073	$50,068
SAVINGS DISCOUNTED - 1989 (10%)				$6,640	$7,482	$4,914	$3,112	$4,468	$4,043	$1,900	$32,559

TABLE 14

THE NAVY'S FY 1991 - FY 1997
SHIPBUILDING PROGRAM

ALTERNATIVE 3 SAVINGS OVER ALTERNATIVE 1
(DOLLARS IN THOUSANDS)

(20% CFM REDUCTION)

NEW SHIPS	NUMBER OF CFM 9 COG LINE ITEMS PER SHIP	-ALTERNATIVE 1- SHIPBUILDER'S COMMERCIAL COST	-ALTERNATIVE 3- COST SAVINGS POSSIBLE BY USING THE FSS	* SHIPS BEING BUILT IN FY * SAVINGS x NUMBER OF SHIPS IN FY							TOTAL SAVINGS PER SHIP CLASS
				FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97	
TRIDENT	4370	$1,613	$746	1 $746							$746
CVN	20000	$7,380	$3,416					1 $3,416			$3,416
SSN-21	4000	$1,476	$683	1 $854	1 $854	1 $854	1 $854	1 $854	2 $1,708	1 $854	$6,832
DDG-51	5025	$1,854	$858	4 $4,291	5 $5,364	4 $4,291	3 $3,219	3 $3,219	4 $4,291	3 $3,219	$27,894
LSD-41	9600	$3,542	$1,640	1 $2,050	1 $2,050	1 $2,050					$6,149
AOE	8800	$3,247	$1,503		1 $1,503						$1,503
ARS	4400	$1,624	$752				1 $939		2 $1,879		$2,818
TOTAL SAVINGS PER FY				$7,942	$9,771	$7,195	$5,012	$7,489	$7,878	$4,073	$49,360
SAVINGS DISCOUNTED - 1989 (10%)				$6,563	$7,341	$4,914	$3,112	$4,227	$4,043	$1,900	$32,100

inaccuracies, Table 13 represents the costs savings if the CFM line items were actually 10% less and Table 14 further reduces them by 20%.

Second, the Alternative 1 cost per line item was estimated by dividing the PMS 396 shipbuilder's total cost by the number of line items. Dividing 5,462 line items into the total cost of $2,016,352.29 yielded an average cost of $369 per line item. This figure represents a realistic price that a Program Manger should expect to pay per line item if the shipbuilder procures the material using an agent. To obtain the total Alternative 1 cost, the number of line items per ship class will be multiplied by $369.

Third, the cost differences discovered between Alternatives 1 and 3 in the FFG-7 and OHIO Class Submarine programs appear to be valid results. However, the OHIO Class Submarine's figures present a more accurate cost picture because of the opportunity costs included in the data. Also, the methodology used to determine the cost savings in the FFG-7 case study was not as robust as the OHIO Class Submarine study. Therefore, to demonstrate the difference between Alternative 1 and Alternative 3, the commercial cost of material per ship will be multiplied by 46.29% to establish the possible cost savings.

Fourth, the FFG-7 Class data demonstrates all DLA material that is CFM which can be transferred to GFM without impacting outfitting availability and operational readiness. Therefore, all CFM DLA cognizance material is included as GFM.

Fifth, this discussion has purposely excluded the surcharges on the FSS line items that have resulted from the unit costing initiative in the Defense Management Review (DMR). It would have been possible to include surcharges for each line item in the calculations for both the FFG-7s and the OHIO Class Submarines. However, that would have skewed the data because the corresponding rise in commercial prices and labor costs for the shipbuilder could not be determined. Escalating costs are a fact of life and in order to compare apples to apples, all costs have been converted to 1989 dollars.

Finally, Table 15 summarizes Tables 12 through 14 by providing estimated savings that the Government could realize if the seven shipbuilding programs transfer their DLA CFM to GFM. Although each program's savings will vary depending on the actual CFM DLA line item count and current procurement procedures, it is obvious that the cost savings potential is significant.

TABLE 15

ALTERNATIVE 3 - SAVINGS POTENTIAL
FY 91 -FY 97 SHIPBUILDING PROGRAM

-SELECTED CLASSES OF SHIPS-

CFM DLA LINE ITEMS	SAVINGS
ORIGINAL FIGURES	$33,019,000
10% REDUCTION	$32,559,000
20% REDUCTION	$32,100,000

VI. CONCLUSIONS AND RECOMMENDATIONS

This thesis achieves the goals and objectives laid out in the first chapter. It has shown that Alternative 3, Contractor Furnished Material (CFM) obtained through the Federal Supply System (FSS), is the most cost effective of the three alternatives for initial ship outfitting. Hidden opportunity costs that could affect each of the alternatives have been discussed and quantified. The impacts that shifting responsibility for all CFM DLA items to the Government could have on material availability, SCN funding, and shipbuilding contracts have been addressed. The primary conclusions and recommendations are presented below.

A. CONCLUSIONS

The following conclusions can be drawn from the tables, examples, and calculations in this thesis.

1. Alternative 3 meets the requirements of higher authority and is the most cost effective of the alternatives.
2. The Government can obtain Contractor Furnished DLA material through the FSS and save over 46% of the shipbuilder's cost.
3. DLA outfitting material availability is at least as good, if not better, using the FSS for mature programs. For

new programs, some initial problems in availability might exist until adequate inventory levels are established.

4. Contract changes are not necessary to implement the transfer of CFM to GFM.

5. It is possible to use existing SCN End Item Account funds to requisition CFM material from the FSS.

6. The use of a vendor's procuring agent to procure the material greatly increases the cost without necessarily ensuring availability.

7. There are costs to the overall system, such as manpower costs at SPCC and requisition processing costs, that are not visible to the Program Managers at Naval Sea Systems Command but must be taken into account when procuring outfitting material.

8. The Ship Program Managers at NAVSEA would be willing to transfer all DLA CFM to GFM as long as availability was not affected.

B. ADVANTAGES/DISADVANTAGES OF ALTERNATIVE 3

1. ADVANTAGES

The preceding analysis has supported several advantages to using Alternative 3 that were identified by PMS 396 in their OHIO Class Submarine Study [Ref. 11:p. 16]. These include:

1. "Just in Time" inventory philosophy could be employed because the shipbuilder would not be buying and storing for more than one ship at a time.

2. Shipbuilder is freed to devote more time and effort to providing CFM allowance material not in the FSS.

3. Higher allowance material availability at delivery.

4. Outfitting dollars are incrementally obligated during ship construction as opposed to earlier obligation when shipbuilding contract is awarded.

5. Government has automated on-line requisitioning through the NSA.

6. System can be applied to any shipbuilding program.

7. Does not require training shipbuilder personnel in FSS material requisitioning and status interpretation.

8. Government can save 40% by transferring all CFM DLA material to GFM.

2. DISADVANTAGES

The disadvantages to Alternative 3 are:

1. Increased number of requisitions through the OSA.

2. Increased level of effort at the NSA may be required.

3. Increased level of effort at SPCC is required.

4. SCN outfitting funds may be open for reprogramming. [Ref.11:p. 17]

C. RECOMMENDATIONS

Based on the foregoing chapters, it appears that all shipbuilding programs should immediately transfer all DLA cognizance CFM to GFM and have the NSAs requisition it from

the FSS. In order to achieve the above, the following concerns must be addressed:

1. Material Availability - Increased communication between the NAVSEA Program Manager, NAVSUP, SPCC, and DLA is required to effectively implement the policy for all shipbuilding programs. A recommendation is for the New Construction Provisioning Study Group to initiate meetings with DLA.

2. SPCC Manpower Additions - In order to adequately prepare for the increased workload at SPCC, it is recommended that SPCC coordinate its requirements with NAVSUP and NAVSEA to ensure the required manpower is in place.

3. NSA Manpower Additions - The requirement for additional personnel at the NSA is open to debate. It is recommended that PMS 396 conduct a post delivery study on the NSAs workload during the outfitting of SSBNs 740-742. Based on the results, Pms and the NSAs will be able to more accurately predict the additional manpower required.

4. Budgeting - PMS 396 has adequately demonstrated that there exists an avenue to fund the additional FSS requisitions through the NSA. The recommendation is for all PMs to adopt this procedure.

5. Contracting - To ensure standardization across all shipbuilding programs, it is recommended that NAVSEA develop standard clause contracts which provide the Government the option for procuring CFM allowance material [Ref. 11:p. 18].

6. Outfit Supply Activity (OSA)- There should not be a noticeable impact at the OSA unless the requirements of the DMR force a change in operating procedures [Ref. 50]. If a change does occur, further communication with the OSA will be necessary.

D. RECOMMENDATIONS FOR FURTHER STUDY

The latest changes brought about by the Defense Management Reviews (DMR) have not been included in this thesis. Because most of the DMR initiatives have not been fully implemented or are still under consideration, their consequences could not be factored in.

One DMR that will impact new construction outfitting is the transferring of all 1H and 3H cognizance material to DLA. A second is the unit costing accounting policy that the Department of Defense (DOD) is starting to require commands to use for determining operational costs. Both of these initiatives have the potential to change the methods and policies currently in place for outfitting ships. Further analysis is needed to adequately assess the impact the DMR will have on the outfitting process.

APPENDIX

ACRONYMS

TERM/ACRONYM	DEFINITION
APL	Allowance Equipage List
AINAC	Application/Identification Number Activity Codes
AIG	Assistant Inspector General
APL	Allowance Parts List
ASN (S&L)	Assistant Secretary of the Navy (Shipbuilding and Logistics)
BIW	Bath Iron Works
BRF	Best Replacement Factor
CBA	Cost Benefit Analysis
CDM	Configuration Data Manager
CDRL	Contracts Data Requirements Lists
CEA	Cost Effectiveness Analysis
CFE	Contractor Furnished Equipment
CFM	Contractor Furnished Material
CLIN	Contract Line Item Number
CM	Configuration Management
CNO	Chief of Naval Operations
COSAL	Coordinated Shipboard Allowance List
CSA	Configuration Status Accounting

DLA	Defense Logistics Agency
DMR	Defense Management Review
DOD	Department of Defense
DODD	Department of Defense Directive
FAR	Federal Acquisition Regulation
FBM	Fleet Ballistic Missile
FLSIP	Fleet Logistics Support Improvement Program
FOMIS	Fitting Out Management Information System
FOSSAC	Fitting Out and Supply Support Assistance Center
FSS	Federal Supply System
FYDP	Five Year Defense Plan
G & A	General and Administrative
GFM	Government Furnished Material
HMEO&E	Hull, Mechanical, Electrical, Ordnance and Electronics
IM	Item Manager
ISEA	In-Service Engineering Agent
ISNSL	Incremental Stock Number Status Listing
LAPL	Lead Allowance Parts Lists
LSA	Logistic Support Analysis
MCC	Mission Criticality Code
MCO	Maintenance Criticality Oriented
MEC	Military Essentiality Codes

MOD-FLSIP	Modified Fleet Logistic Support Improvement Program
NAVCOMPT	Office of the Comptroller, Navy
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NHA	Next Higher Assembly
NLA	Next Lower Assembly
NSN	National Stock Number
NSA	Naval Supervising Activity
OSA	Outfit Supply Activity
PAT	Process Action Team
PO	Purchase Orders
PTD	Provisioning Technical Documentation
RIC	Repairable Identification Codes
ROMIS	Real Time Operation Management Information System
SCLSIS	Ship's Configuration and Logistics Information System
SCN	Shipbuilding and Conversion, Navy
SCRAMP	SCN Consolidated Residual Asset Management Program
SECDEF	Secretary of Defense
SHAPM	Ship Acquisition Project Manager
SNAP II	Shipboard Nontactical ADP Program
SPM	Ship Program Manager
SPR	Ship Provisioning Requests

SPTD	Supplemental Provisioning Technical Documentation
SSR	Supply Support Requests
SUPSHIP	Supervisor of Shipbuilding, Conversion and Repair, USN
TECHSPEC	Technical Specification
UIC	Unit Identification Code
WSF	Weapon System File

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