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IMPLEMENTATION OF IMPROVED
MANAGEMENT CONTROL OF AVIATION
DEPOT LEVEL REPAIRABLE FUNDS

by

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Implementation of Improved Management Control of Aviation Depot Level Repairable Funds

by

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ABSTRACT

The purpose of this study is to evaluate the implementation process of the conversion of Aviation Depot Level Repairable (AV-DLR) funding to the Navy Stock Fund. On April 1, 1985 this conversion was implemented to obtain the following objectives: (1) to improve the supply system discipline; (2) to improve financial flexibility; (3) to improve budget forecasting; (4) to improve material support responsiveness. This thesis will examine the implementation process and present specific recommendations for improving the management control of AV-DLRs in the area of budgeting, feedback, and accountability.

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I. INTRODUCTION

A. BACKGROUND

In recent years the Department of the Navy has come under criticism from the general public on how its tax dollars are spent. In reaction to this, Congress has placed tighter controls on the Navy. The need for efficient and effective management control has never been greater then it is today. The Navy is continually searching for ways to improve its ability to optimize output while minimizing cost.

This study will examine one case where the initial funding for Aviation Depot Level Repairables (AV-DLRs) has been converted from periodic appropriations to the revolving Navy Stock Fund (NSF). Originally the items were procured by the Aviation Supply Office (ASO) and *given* to the end-user, a squadron, at no charge.This procedure was termed a "free issue" and does not imply the type of control that is required for an effective and efficient organization. A study was directed by the Chief of Naval Operations (CNO) to determine the best way to improve the system. The results from this study recommended conversion of the funding to the NSF. In general, the proposal identified four objectives that would be accomplished:

(1) improve the supply system discipline;
(2) improve financial flexibility;
(3) improve budget forecasting;
(4) improve material support responsiveness;

April 1, 1985 was set as the target date for this conversion. This study will evaluate the procedures that were implemented to carry out that change. It will specifically look at an "ideal" management control system, problems that have arisen with the conversion, and recommendations to improve the implemented system. The four objectives will be evaluated to determine the degree of achievement of subsequent to conversion.

The overall goal of this conversion was to optimize readiness with the limited resources provided by Congress. The actual change in readiness will only be seen over time. Therefore, other measures will be examined that do relate directly to readiness in the long run.

B. METHOD

This section describes how the information was obtained for this study. A literature search on management control and budget control was conducted. From this information a management control process was derived for the non-profit organization, with a heavy emphasis on use of budgets as a control tool. Comprehensive reviews of the Federal Government budget process and Navy budget process were performed. Then in depth research to attain a complete understanding of the AV-DLR process from budgeting and funding through accountability was undertaken. The methodology used in gaining this understanding follows:

(1) The collection and review of all Navy instructions and material pertaining to the AV-DLR system was conducted. This included implementation plans on the conversion of the AV-DLR funding to the Navy Stock Fund.

(2) A review of studies that pertain to the AV-DLR process was also undertaken. Studies on Aviation Fleet Maintenance (AFM) funds were reviewed in this process due to the similar funding requirements.

(3) Interviews were conducted with the Comptrollers of an East Coast and West Coast Naval Air Station.

(4) A telephone interview was also conducted with the Naval Air Forces Pacific AV-DLR funds manager.

C. ORGANIZATION

The organization and content of this study can be divided into three parts. The first part includes Chapters 2 and 3. Chapter 2 begins with the concept of control and develops an "ideal" management control system. The chapter then continues with the discussion of the non-profit organization and the importance of a budget as a control tool in that system. This then leads into Chapter 3, which examines the Federal budget process and the Navy budget process.

The second part starts with a comprehensive review of the history of the AV-DLRs in Chapter 4. The problems with the old system and the reasons for the change are explored. Chapter 5 then proceeds to examine the implementation process undertaken during the conversion of the AV-DLR funding to the Navy Stock Fund.

The last part of this thesis contains conclusions and recommendations developed as a result of this study. Chapter 6, which contains these findings, lists some specific recommendations to help implement the "ideal" management control system that was listed in Chapter 2. The chapter ends with some suggestions for future study.

II. MANAGEMENT CONTROL THEORY

A. GENERAL

Prior to an evaluation of the Navy's management control system for the AV-DLR funding, a theoretical management control system must be developed. This "ideal" management control system will then be used in the following chapters to examine the present control system. This chapter will define management control, examine the principles of successful control systems and evaluate how the system relates to the military organization.

B. THE CONTROL PROCESS

What is control? The Oxford English Dictionary defines control as the power or authority to direct and govern; a standard for comparing and testing. Peter Drucker states that ". . . control is an ambiguous word. It means the ability to direct oneself and one's work. It can also mean domination of one person by another" [Ref. 1: p. 131]. George R. Terry states that ". . . controlling is determining what is being accomplished, that is, evaluating the performance and, if necessary, applying corrective measures so that the performance takes place according to plans" [Ref. 2: p. 535].

These definitions on control sound very much like the ones for management. Terry suggests that the concept of controlling is synonymous with that of management. But that it is only partially true because controlling is only a part, but an important part, of the entire concept of management [Ref. 2: p. 535]. Terry's definition for management is ". . . a distinct process consisting of planning, organizing, actuating, and controlling, performed to determine and accomplish stated objectives by the use of human beings and other resources" [Ref. 2: p. 4].

James Stoner [Ref. 3] has a similar definition of management where he lists planning, organizing, leading and controlling as his four main management activities. Koontz and O'Donnell go one step further when they identify five basic management activities, planning, organizing, staffing, directing, and controlling [Ref. 4].

Terry shows how controlling in the whole management process and the concept of feedback and its relationship in controlling are related in Figure 2.1.

Figure 2.1 shows planning, organizing and actuating directed to basic resources with "results actual" being recorded. These are then compared with "results expected"

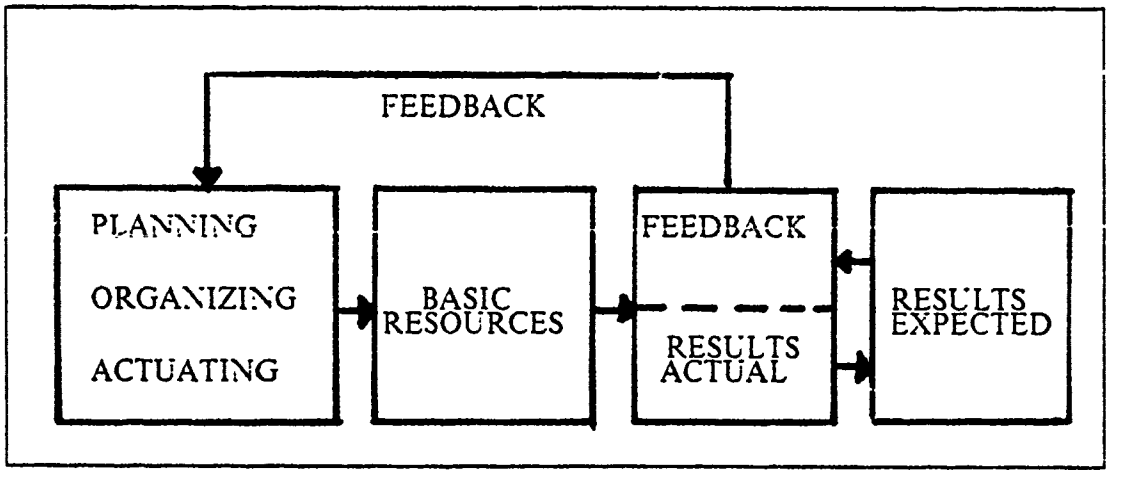

Figure 2.1 Controlling and Feedback with Relationship to Planning, Organizing, and Actuating.

or the standard. Any difference between these two provides the feedback which indicates the amount of correction to be made if the present plan is to be successful. Now that control has been defined in the management environment the control system has to be looked at. [Ref. 2: p. 539]

Anthony, Dearden, and Bedford state that a control system will have at least four components: [Ref. 5: p. 6]

(1) An observation device that detects or observes and measures or describes the activities or other phenomena being controlled. The term for this component may be observer, detector, or sensor.

(2) An assessing device that evaluates the performance of an activity or organization, usually relative to some standard or expectation of what should be, and identifies out-of-control activities and conditions. The term for this component is evaluator, assessor, or selector.

(3) A behavior modification device for altering or changing performance if the need for doing so is indicated. This component may be called a director, modifier, or effector.

(4) A means of transmitting information among the other devices. This component's term is communication network.

The following example [Ref. 6: p. 4] demonstrates the control system described, and uses the analogy of a thermostat to illustrate it more clearly. The thermostat has a thermometer (detector) to measure the present temperature. It then compares that actual measurement to the desired temperature (evaluator). The furnace is controlled until the desired temperature is reached then turned off (effector). The information is transmitted by electrical impulses (communication network). This is an electrical control system and can easily be applied to a biological control system (i.e., how the

human body controls temperature) and even a mental control system (i.e., how a person drives a car using his brain and sensing organs). These are "simple" control systems. These are simple in that control of an organization as a whole is much more complicated due to the large degree of variables.

C. MANAGEMENT CONTROL

In the previous section, control was looked at in the overall view of management and a simple control system described. Management control has been defined a number of ways, the following are just a few of those definitions:

(1) Mockler: Management control is a systematic effort to set performance standards with planning objectives, to design information feedback systems, to compare actual performance with these predetermined standards, to determine whether there are any deviations and to measure their significance, and to take any action required to assure that all corporate resources are being used in the most effective and efficient way possible in achieving corporate objectives. [Ref. 6: p. 2]

(2) Stoner: Management control is the process through which managers assure that actual activities conform to planned activities. [Ref. 3: p. 592]

(3) Anthony, Dearden, and Bedford: Management control is primarily a process for motivating and inspiring people to perform organization activities that will further the organization's goal. It is also a process for detecting and correcting unintentional performance errors and intentional irregularities, such as theft or misuse of resources. [Ref. 5: p. 11]

(4) Koontz and O'Donnell: The managerial function of control is the measurement and correction of the performance of subordinates in order to make sure that enterprise objectives and the plans devised to attain them are accomplished. [Ref. 4: p. 639]

These definitions are all concerned with measuring, comparing and taking corrective action. These definitions lead to a number of different control processes by those and other authors. They all have essentially the same steps:

(1) Koontz and O'Donnell: (1) establishing standards; (2) measuring performance against these standards; (3) correcting deviation from standards and plans [Ref. 4: p. 640]

(2) Mockler: (1) establish standards and methods for measuring performance; (2) measure the performance; (3) does the performance match the standard?; (4) take corrective action [Ref. 6: p. 2]

(3) Newman: (1) define desired results; (2) establish predictors of results; (3) establish standards for predictors and results; (4) establish the information and feedback network; (5) evaluate information and take corrective action [Ref. 7: pp. 12-25]

(4) Terry: (1) measuring the performance; (2) comparing performance with the standard and ascertaining the difference, if any; (3) correcting unfavorable deviation by means of remedial action [Ref. 2: p. 53]

Anthony, Dearden and Bedford [Ref. 5: p. 10] state that three phases to management control process are the planning of the action, the execution of that action and the evaluation of the action. They continue by listing these three phases of

the process as strategic planning, management control and task control. The term strategic planning is described as the process of deciding on goals and the development of broad strategies in attaining these goals. Management control is the process where management assures that the organization carries out those strategies. Task control assures that the tasks are carried out effectively and efficiently.

Mockler [Ref. 6: p. 4] states that in addition to measuring, comparing, and taking corrective action, modern management control must also be able to create and communicate effective standards, develop information reporting standards and take positive action to improve operations.

Two of the three previous theses related to Aviation Fleet Maintenance (AFM) Funds [Refs. 8,9] adopted the Mockler model as an "ideal" management control process. This model will also be used in this thesis. However, as a number of authors, Terry, Koontz, O'Donnell, Anthony, Dearden, Bedford, and Mockler [Refs. 2,4,5,6], state, the control process may be general in nature, but it then has to be developed for a specific area of concern. The five step model that will be used in this thesis follows: [Ref. 9: p. 30]

(1) set performance standards consistent with the planning objectives;

(2) design the information feedback system;

(3) compare actual performance with predetermined standards;

(4) determine whether there are deviations and measure their significance;

(5) take any action required to assure that all organizational resources are being used in the most effective and efficient way possible in achieving organizational objectives;

This system will be used to evaluate the AV-DLR program. Although it has been used in the two previous theses, the specific aspects to be emphasized are different.

D. MAJOR CONTROL PRINCIPLES

Koontz and O'Donnell [Ref. 4: pp. 672-676] list major control principles that have to be used in order to develop an effective management control system. These principles will also be used to evaluate the present AV-DLR program in the Navy. Following is the list of Koontz and O'Donnell's control principles:

(1) Assurance of Objective - The task of control is to detect potential or actual deviations from plans early enough to permit effective corrective action.

(2) Efficiency of Controls - The control techniques and approaches are efficient when they detect and identify the causes of actual or potential deviations from plans with a minimum of costs or other unwanted consequences.

(3) Control Responsibility - The primary responsibility for the exercise of control rest in the manager that is charged with the execution of the plan.

(4) Direct Control - The most effective technique of control is to assure the quality of subordinate managers. The higher the quality of managers, the less will be the need for indirect controls.

(5) Reflection of Plans - The more specific the controls are designed to the area of concern, the more effective they will be in dealing with the situation.

(6) Organizational Suitability - The more controls are designed to reflect the place in the organization structure where responsibility for action lies, the more they will help correct deviations from plans.

(7) Individuality of Controls - Effective controls require consistency, operational responsibility, ability to understand, and needs of the individual concerned. Control information which a manager cannot or will not use has very little value.

(8) Standards - Effective and efficient controls are required to be objective, accurate, and suitable for the purpose intended.

(9) Critical-point Control - Effective control requires attention to those factors that are critical to appraising performance against an individual plan.

(10) Exception - The more a manager concentrates his control efforts on exceptions, the more efficient the results of his control.

(11) Flexibility of Controls - For controls to remain effective despite failure or unforeseen changes of plans, flexibility must be in their design.

(12) Action - Control is justified only if deviations are corrected through appropriate planning, organizing, staffing and directing.

Stoner also uses these principles when he talks about an effective control system. Stoner states for a control system to be effective, it must be accurate, timely, objective, focused on key performance areas and strategic control points, economically realistic, organizationally realistic, coordinated with the organization's work flow, flexible, prescriptive, and acceptable to organization members. [Ref. 3: p. 606]

E. THE MILITARY ORGANIZATION

The management control system that has been described above is relevant to either a profit or a non-profit organization. Anthony, Dearden and Bedford [Ref. 5: pp. 745-764] discuss aspects of control that differ between profit and non-profit organizations. Some aspects of control of specific concern in non-profit organizations are of interest.

1. Measures

Organizations are required to use an input (resource) to produce an output (goods and services). Efficiency is measured by the relationship between inputs and outputs. Effectiveness is how well the outputs accomplish the objective. In a profit-oriented organization, profit can be used to measure both effectiveness and efficiency.

This one control tool is the most important difference between profit and non-profit organizations [Refs. 2,3,6]. There are significant advantages to an organization that can use the profit measure in control. First a profit measure permits a single criterion to be evaluated for determining a course of action. Second it provides for quantitative analysis between different proposals. Third it provides for a single broad measure of performance. Finally it facilitates decentralization and permits comparisons of performance among different centers.

The military organization is a non-profit organization and therefore, does not have this control tool available. The output of service is very hard to measure as compared to a profit organization. As a result it does not easily lend itself to be used as a measure of performance. Even the relationship between costs and benefits are hard to quantify in the non-profit organization. Even when outputs can be quantified the goal of a non-profit organization is to render as much service as possible for a given amount of resources or to use as little resources as possible for a given amount of service. The measurement problem then lies in evaluating outputs and not in the examination of inputs.

Anthony, Dearden, and Bedford distinguish two types of measures: results measures and process measures. A results measure compares outputs to an organization's objectives. This should be in measurable terms; however as previously addressed this is not always possible for a non-profit organization, and a surrogate or proxy measure should then be used. A results measure relates to the impact the organization has on the outside world and the process measure to an activity carried on by the organization. The difference between these two is that the results measure is "ends oriented" while the process measure is "means oriented". Results measures and process measures will be discussed in later chapters. [Ref. 5: p. 757]

2. **Budgets**

Budgets are formal statements of the financial resources that are set aside for carrying out specific activities in a given time period. They establish clear and unambiguous performance standards. At stated intervals during the given time period, actual performance will be compared directly with the performance standards. Deviations can quickly be detected and acted upon. These reasons make budgets a widely used control tool. [Ref. 3: p. 619]

Budgets must not be confused with forecasts or projections. A forecast is a prediction of what will most likely happen. It does not imply that the forecaster will

attempt to shape events so that the forecast will happen. A projection is an estimation of what will happen if various conditions and situations should exist. A forecast is exclusively a planning tool, while a budget is both a planning tool and a control tool. All budgets include some forecasting in that budgetees cannot be held responsible for certain events that affect their ability to meet budgeted objectives. The way the manager is able to mix the planning and control aspects of a budget will determine how effective the budget will be. [Ref. 5: pp. 443-444]

Budgets are the most widely used control tool in both profit and non-profit organizations [Refs. 2,3,6]. The profit-oriented organization allows managers to change budgets when profits will be increased. In the non-profit organization the input or resources are normally fixed so it is very hard to change the budget. If the budgeted expenses exceed the standard in a non-profit organization then the expenses have to be reduced. This lack of flexibility makes the planning phase of the budget in the non-profit organization that much more important. This fact and the lack of the "profit" control tool makes budgeting that much more important in the non-profit oriented organization. [Ref. 5: p. 762]

The budget is the most important control tool in the AV-DLR management control process, and will be the primary focus of this thesis. Stoner and Terry [Refs. 3,4: pp. 632, 633] list some advantages and disadvantages that have to be kept in mind when using budgets as a control tool. Some advantages are:

(1) Actions are likely to be based on study and careful considerations reducing the chance for a snap decision.

(2) Weakness in the organization, managerial ability and personnel are identical.

(3) Waste reduction is promoted.

(4) It is easier to coordinate the work of the entire organization.

(5) It helps people learn from past experience.

(6) It can serve as a means of evaluation.

Some disadvantages are:

(1) It is only a tool and is subject to human judgement, interpretation, and evaluation.

(2) It can not prevent deviations from appearing. It does not ensure satisfactory results nor does it control automatically.

(3) Good and adequate standards are mandatory and these are sometimes difficult to come by.

(4) Skill and experience are required to make budgetary control work.

(5) Good communication up and down the chain of command is required. The goals have to be identified and attainable, which is not always easy to do.

In the next chapter we will look at what role the federal budget and the Navy budget play in the AV-DLR program.

F. SUMMARY

The purpose of this chapter was to develop a management control process that could be tailored for the AV-DLR program. First. control was defined. Second, a simple control process was discussed. Third, management control was defined and an "ideal" management control process presented. Forth, control principles that are found in good control systems were listed. Fifth, the military organization was looked at to identify differences between the profit and non-profit organization. This discussion led to measures being discussed and then to the primary control tool for the non-profit organization, the budget. The primary focus of this thesis will be on the AV-DLR budget within the Navy.

III. AVIATION DEPOT LEVEL REPAIRABLE (AV-DLR) FUNDING

A. GENERAL

AV-DLR funds are appropriated by the Federal Budget process to the United States Navy. This process is discussed in this chapter and a number of terms and definitions that relate to the process are identified. After the discussion of the Federal Budget process is completed the budget process within the Navy will be described.

The use, flow, and budgeting of AV-DLR funds are presented. Different appropriations are identified in order to better understand how the AV-DLR funding fits into the overall Navy budget process.

B. THE FEDERAL BUDGET PROCESS

The main purpose of the budget process is to allocate scarce resources among competing public requirements. Budgeting is geared to a cycle which allows new information to be absorbed. There are three main phases of the process that will be of interest:

(1) Executive Formulation

(2) Congressional Enactment

(3) Budget Execution

1. The Executive Formulation

The first phase consists of the Planning, Programming, and Budgeting stages of the Department of Defense's (DOD's) formulation process. It takes over two years for the first two phases to be completed, and three years for the entire process. As a result there are always three different fiscal year budgets active at one time. [Ref. 10: p. A-3]

The Planning, Programming, and Budgeting System (PPBS) was introduced to the DOD by then Secretary of Defense Robert McNamara in the 1960's. The system was "designed to assist the Secretary of Defense in making choices about the allocation of resources among a number of competing or possible programs and alternatives to accomplish specific objectives in our national defense" [Ref. 10: p. A-9]. The PPBS is really the planning resources management system in the DOD. This system establishes the framework and decision making process for future programs and also allows prior decisions to be reviewed in regard to the current environment.

The planning phase starts with the preparation of the Joint Strategic Planning Document (JSPD), by the Joint Chiefs of Staff (JCS). This document is used by the Secretary of Defense to formulate the Defense Guidance (DG).

> The DG provides the definitive policy, strategy,force planning, resource planning, and fiscal guidance upon which all Defense planning and programming are based. It also includes threat and opportunity assessments and statements of issues requiring further study or top management attention. [Ref. 11: p. 3-2]

The planning phase ends and and the programming phase begins with the issuance of the DG.

> The basic purpose of the programming phase in the PPBS is to translate the strategy into program force structures in terms of time-phased resource requirements including personnel, monies, and material. This is accomplished by systematic approval procedures that "cost out" force objectives for financial and manpower resources five years into the future. [Ref. 10: p. A-11]

Based upon the DG. each of the services prepare their respective Program Objective Memorandum(POM). The POM is an annual document in which each Military Department and Defense Agency recommends and describes its total program objectives within DOD-specified resource constraints. Program objectives are fiscally constrained [Ref. 11: p. 3-3]. The POM provides the justification for changes from the Five Year Defense Program (FYDP) base and is the means of submitting revision requests to the Secretary of Defense [Ref. 10: p. A-11]. After the POMs are submitted, the JCS issue the Joint Program Assessment Memorandum (JPAM).

The JPAM provides a risk assessment based on all of the force recommendations of the Services' POMs and includes the view of JCS on the balance and capabilities of all the force levels [Ref. 11: p. 3-4]. The Secretary of Defense reviews the POMs and the JPAM and issues the Program Decision Memorandum (PDM). The PDMs record the decisions of the Secretary of Defense on the POMs. The programming phase ends when the Secretary of Defense issues the PDM.

The final phase of the PPBS is Budgeting. The annual budget expresses the financial requirements to support the programs that were approved during the preceding phases. It is through the budget that the planning and programming are translated into annual funding requirements [Ref. 10: p. A-13]. A joint budget review by the Office of Management and Budget (OMB) and the DOD is conducted and the

results are issued in the Program Budget Decisions (PBDs). The PBD is then used to determine the President's Budget. This completes the executive formulation phase.

2. **Congressional Enactment**

The Congressional enactment phase starts with the submission of the President's budget. The Congressional Budget Act of 1974 requires that the President submit his budget to Congress in January, nine months before it goes into effect. Congress has from January until October, the begining of the budget year, to decide on authorizations and appropriations. The following two definitions are provided from Aaron Wildavsky: [Ref. 12: p. 281]

- Authorization: Basic substantive legislation enacted by the Congress that sets up a federal program or agency, either indefinitely or for a specified period of time. Such legislation is a prerequisite for the subsequent enactment of budget authority and may set limits on the amounts that can be appropriated.
- Appropriation: An act of Congress that allows federal agencies to incur obligations and to make payments out of the Treasury for specified purposes. This is the most common form of budget authority.

Two types of appropriations that pertain to the AV-DLR process need to be defined. The two are the expense type appropriation and the investment type appropriation. The expense type appropriations finance ongoing operations, which in the Navy, includes Operations and Maintenance (O&M) and Military and Personnel (MP). The investment type appropriations finance investments such as procurement and construction, which includes Aircraft Procurement, Navy (APN). [Ref. 10: A-6]

The AV-DLR funding was changed from an investment type appropriation to an expense type appropriation in April 1985. This was a major change, as the major claimant responsible for each type appropriation is different. These appropriations are discussed in the next section.

The Congress hears testimony on the President's budget and bases their decisions with respect to programs and funding levels on this information. The Navy's ability to obtain passage of required legislation depends upon sound justification of its requirements, which is a function of how well the Navy's position is presented. The more documentation for a requirement the stronger the chance of it being approved. [Ref. 10: p. A-16]

Congress agrees on and passes the Authorization Acts and then passes corresponding Appropriation Acts, which completes the Congressional enactment phase of the process.

3. Budget Execution

After Congress has completed their phase and the President signs the Appropriation Act the budget execution can begin. The implementation of the act is done by way of an Appropriation Warrant. The warrant is issued by the Treasury Department and stipulates the amount of the appropriation and lists any restrictions imposed on the appropriation. The warrant then goes to the head of the General Accounting Office (GAO), the Comptroller General of the United States, for countersignature. This allows for both the Executive and Legislative branches to agree on and sign the warrant. When the warrant is countersigned then the appropriated funds are available for apportionment and allocation. Definitions for apportionment and allocation follow: [Ref. 10: p. A-27]

- Apportionment: Is a determination made by the Office of Management and Budget which limits the amount of obligations or expenditures which may be incurred during a specified time period. It is a violation of the law to obligate or expend more then the apportioned amount.
- Allocation: Is an authorization by Comptroller of the Navy, making funds available within a prescribed amount to an operating agency for the purpose of making allotments; i.e., the first subdivision of an apportionment.

C. THE NAVY BUDGET PROCESS

This section examines the Navy budget process and the flow of funds within the Navy, both prior to and after the AV-DLR funding conversion to the Navy Stock Fund.

1. Navy Budget

The Navy budget process is examined here to determine how the funding for the AV-DLR program is accomplished. The Department of Defense Program Objective Memorandum, that was described previously, is developed from the POMs submitted by each Service. The Secretary of the Navy has assigned a number of organizations and offices responsibility for submitting the Navy's POM. They include:

(1) Department of the Navy Program and Information Center (DONPIC)
(2) Civilian Executive Assistants
(3) Chief of Naval Operations and the Commandant of the Marine Corps
(4) Director, Office of Program Appraisal
(5) Comptroller of the Navy

In May of each year the Comptroller of the Navy issues a budget call which requires all major claimants to submit budget requirements for operational and staff functions (AV-DLR requirements fall into this category).

There is a significant difference between the budget process prior to and after the AV-DLR funding conversion to the Navy Stock Fund. Prior to the conversion, the Commander, Naval Supply Systems Command (NAVSUP) would provide the budget request to the Comptroller of the Navy via the Chief of Naval Operations (CNO). This request was submitted in two types, one for procurement, in the form of Aircraft Procurement, Navy (APN) Funds, and the other for repair, in the form of Operations and Maintenance, Navy (O&M,N) Funds. The APN funds would be submitted over three years in advance (i.e., requirements submitted in May 86 are for fiscal year 1990) and are long range forecasts. The O&M,N funds are for just over a year away (i.e., requirements submitted in May 86 are for fiscal year 1988). NAVSUP received input for AV-DLRs from the Aviation Supply Office (ASO).

The conversion to the Navy Stock Fund (NSF) requires that the end user reimburse the stock fund when they draw AV-DLRs from it. The NSF is managed at the NAVSUP level with any required increase to the corpus of the NSF being budgeted by NAVSUP. However, individual AV-DLRs drawn from a Stock Point to replace inoperable items at the operating forces level are funded by O&M,N money transferred from the supporting Naval Air Station's Operating Budget to the NSF. This requires that operating Budget Holders budget O&M,N Funds to reimburse the NSF for both the procurement of new AV-DLRs for stock and repair of inoperable carcasses.

A typical end user is a Naval Air Station, and the budget requirement and budget process will now be described. The funding requirement that is submitted for a particular west coast air station is determined at the Commander Naval Air Force, U.S. Pacific Fleet (COMNAVAIRPAC) level [Ref. 13]. This input is sent through the Commander-in-Chief, U.S. Pacific Fleet (CINCPACFLT) to the Chief of Naval Operations to the Comptroller of the Navy. The information is then combined with other inputs and is used to determine the current apportionment and to formulate the Navy's POM for outyears. The documentation for these requirements is later used as program justification for Congress, as was previously discussed in the federal budget process.

The input that COMNAVAIRPAC submits will be evaluated along with the other Navy requirements and incorporated into the Navy's POM. Then it will again be reviewed before it is placed into the DOD's POM. The requirements will also be evaluated and tested during the remainder of the PPBS process and then by Congress. The need for proper documentation and accounting is very important if the funding levels required are to be appropriated.

2. **Flow of Funds**

After the funds are appropriated by Congress, apportionment can be determined. The Office of Management and Budget apportions the AV-DLR funds on a quarterly basis to the Secretary of Defense. The Secretary of Defense then provides an apportionment to the Secretary of the Navy. The funds are then allocated to the Chief of Naval Operations (CNO). The CNO Comptroller (OP-92) is the Responsible Office for these funds. At this point is where the change occurs to the funding process. Prior to the conversion the funds were in the form of APN money and suballoted by the CNO comptroller to the Chief of Naval Material (NAVMAT). From NAVMAT the funds were provided to NAVSUP in the form of a suballotment. NAVSUP then issued Operating Budgets/Technical Operating Budgets to ASO for the funds. The flow of funds from Congress to ASO is shown in Figure 3.1. [Ref. 10: p. G-15]

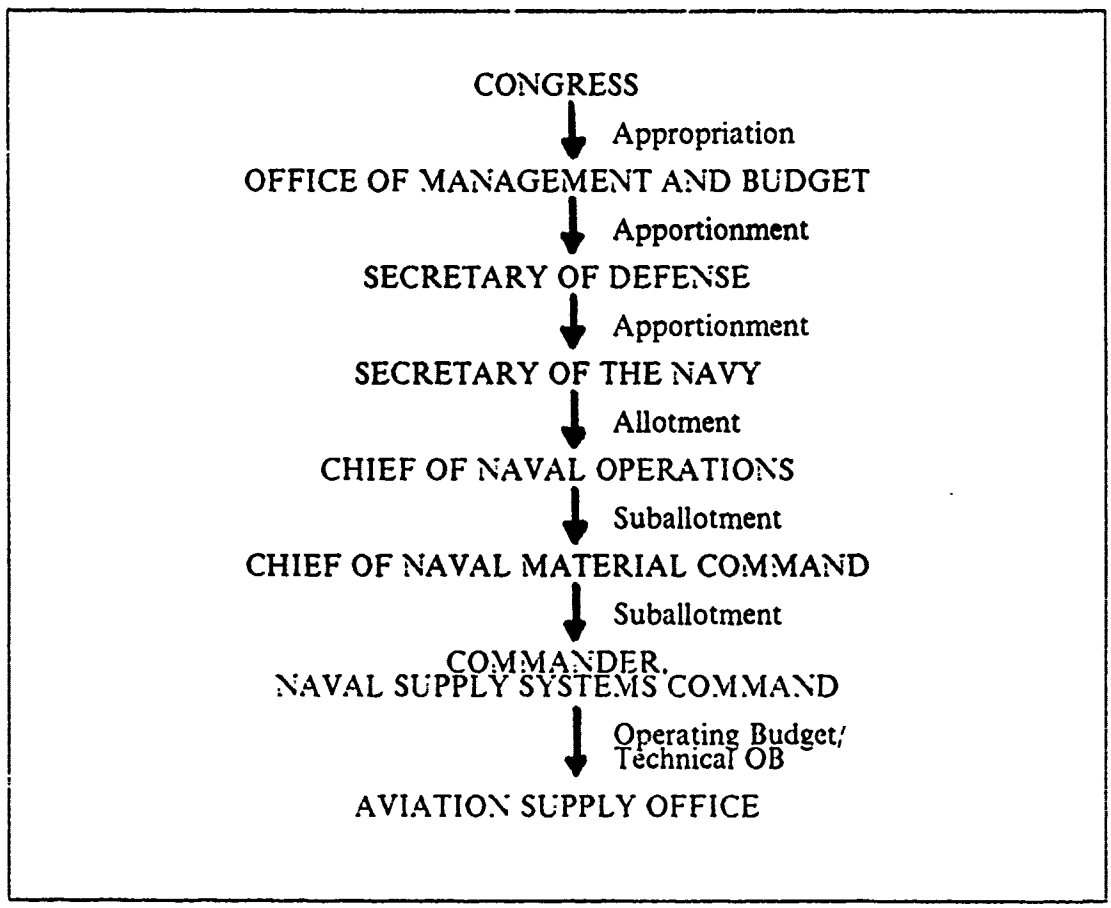

Figure 3.1 Flow of Navy Funds (prior to conversion).

Subsequent to the conversion, the funds are issued to the operating forces in the form of O&M,N money. The funds to purchase AV-DLRs are part of the Fleet Commander's O&M,N allotments received from CNO. COMNAVAIRPAC receives an expense limitation from CINCPACFLT, the Fleet Commander, and then provides the Naval Air Station (NAS) with an operating budget. The operating budget makes the NAS a responsibility center for these funds. The flow of funds from Congress to the NAS is shown in Figure 3.2. [Ref. 10: p. A-28]

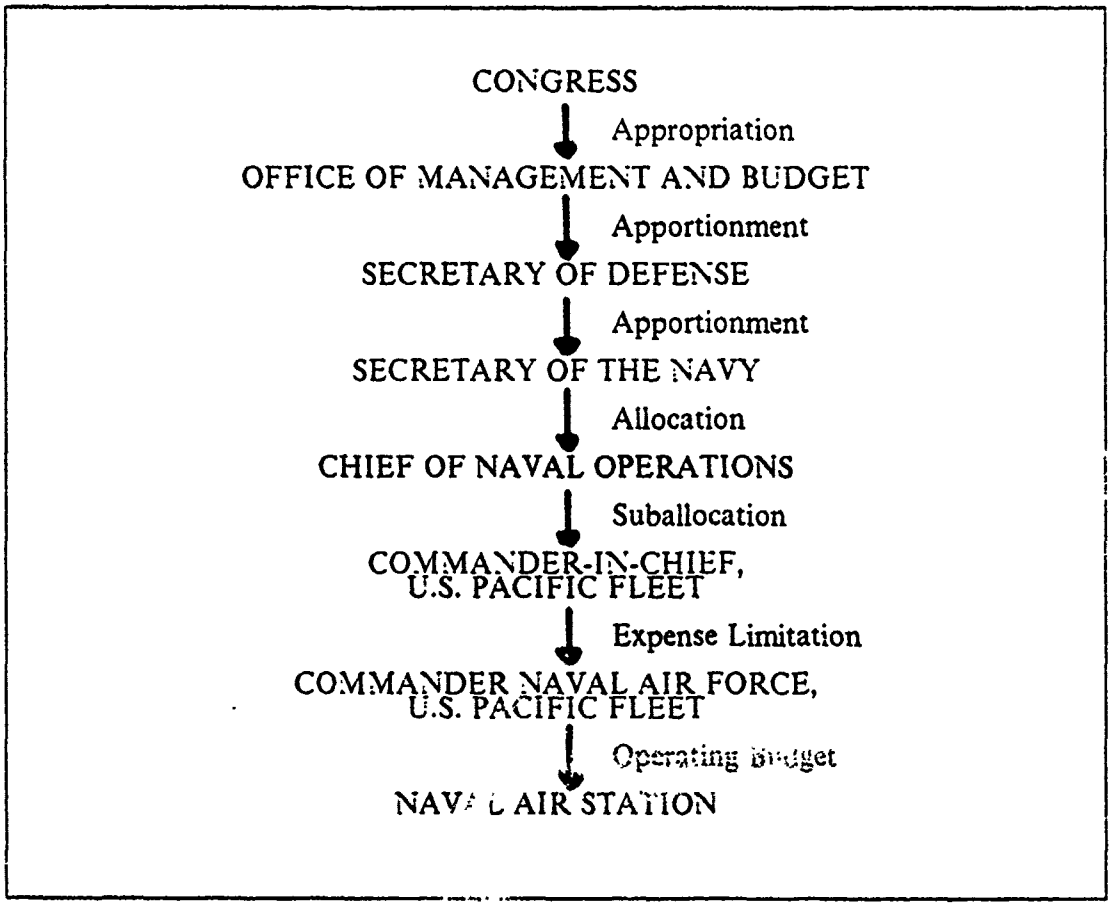

Figure 3.2 Flow of Navy Funds (after conversion).

As a responsibility center the Base Commander falls under section 1517 of 31 USCA. What this means to the Commander follows: [Ref. 10: p. A-28]

(1) It prohibits him from making or authorizing an obligation in excess of the amount available in an appropriation or subdivision thereof or in excess of the amount permitted by agency regulations.

(2) Requires that the person who violates (1), be subjected to discipline which may include suspension without pay, removal from office, a fine up to $5,000 and imprisonment for two years.

D. SUMMARY

This chapter provided a broad overview of the Budgeting process that results in the approval and allocation of AV-DLR funds. First, the Federal Budget Process was examined. The three phases (1) Executive formulation, (2) Congressional enactment, and (3) Budget execution were discussed. Second, the Navy Process was described where the Navy budget formulation and then the flow of funds within the Navy was presented. Third, the different appropriations, expense and investment, were identified. This information will aid to the understanding of the problems that will be addressed in the remaining chapters of the thesis.

IV. AVIATION DEPOT LEVEL REPAIRABLE HISTORY

A. GENERAL

The last chapter depicted the budget process for AV-DLRs and described different types of appropriations in general terms. This chapter will take a closer look at the appropriations. AV-DLRs will be defined in specific terms and the evolution of the AV-DLR process will be examined until funding was converted to the Navy Stock Fund (NSF). The problems that the system encountered and which problems were targeted to be corrected by the funding conversion will also be addressed in this chapter. The chapter will end up with a discussion on the NSF. The information for this chapter was obtained primarily from interviews and instructions.

B. BACKGROUND

What are Aviation Depot Level Repairables? They are secondary items that are repaired at the depot level for aviation units. There are also Depot Level Repairables (DLRs) that are secondary items for the surface and subsurface units. The AV-DLRs are managed by the Aviation Supply Office (ASO), while the DLRs are managed by the Ships Parts Control Center (SPCC). The AV-DLRs are the primary concern of this thesis. However, there will be references made to the DLR program. To be more specific AV-DLRs are separated into groups, and each group is assigned a specific "cognizance (cog) symbol". The item management and ownership is identified by the cog symbol.

These different groups are the responsibility of a certain organization and the funding for these parts come from different appropriations. Figure 4.1 shows the aviation depot level universe prior to incorporating them into the Navy Stock Fund. [Ref. 14: p. 11-7]

The funding for all of these items were accomplished by investment type appropriations. They include Aircraft Procurement, Navy (APN), Weapons Procurement, Navy (WPN) and Other Procurement, Navy (OPN) which are all procurement appropriations. As procurement appropriations they are fully funded three year appropriations. The appropriations have a three year obligational availability and have funds appropriated to fully construct a specific number of units. This requires range forecasts as opposed to current year appropriations that are only available for obligation for one year. [Ref. 10: p. A-6]

Cog Sym	*Description*	*Approp*	*Procured By*
2R	Aeronautical Material of a Depot Level Repairable Nature (Excluding Target/Drone Components)	APN	ASO
2R	Components and Assemblies in Support of Aerial Targets/Drones	WPN	ASO
8R	Major Aeronautical Systems	APN	NAVAIR
4R	Components and Assemblies in Support of Shipboard Launching and Arresting Gear, Visual Landing Aids, and Jet Blast Deflectors	OPN	ASO
6R	End Items of Ground Support Equipment	APN	ASO
8N	Peculiar Parts, Components or Assemblies in Support of Training Devices	APN	ASO
4Z	Aircraft Suspendable, Releasable or Ejectable Material	APN	ASO
6K	Photographic, Meteorological and Reuseable Containers	APN	ASO

Figure 4.1 Aviation Depot Level Repairable Universe.

In May of 1979 the CNO directed the Chief of Naval Material (CNM) to initiate a study to determine the minimum unit price, and minimum annual demand, where it would be uneconomical to repair a given item at the depot level. Items that were found to be below this minimum were designated as consumables or field level repairables. The dollar range for this cutoff was between five hundred and one thousand dollars. These items were removed from the depot level repairable category. The average cost for an AV-DLR is in the area of three thousand eighty dollars [Ref. 13].

C. ACCOUNTABILITY

How were these high value items managed prior to the conversion of AV-DLR funding to the Navy Stock Fund? The process is described for a five thousand dollar aircraft radio. A squadron at a Naval Air Station (NAS) that has an Aircraft

Intermediate Maintenance Department (AIMD) and is also a Stock Point for the piece of AV-DLR equipment (i.e., the radio) is looked at. The AIMD is a repair facility that can not do depot level work. The Stock Point is a place that is designated by ASO to hold AV-DLRs in inventory until they are required.

The squadron took the broken aircraft radio to the AIMD. If the AIMD had a radio in stock that worked, designated Ready For Issue (RFI), they would issue it to the squadron and take the broken one. The squadron would not have been charged anything for the five thousand dollar radio. The radio that was issued was purchased by ASO with APN money and held in a Appropriation Purchase Account (APA). AIMD would then try to repair the broken radio using O&M,N money for both parts and labor. If the AIMD could not fix the radio it would have then been sent to a Designated Overhaul Point (DOP) for repair. The transportation of the broken radio to the DOP and the funding for the DOP and any parts came from O&M,N money. The fixed radio was then be sent back to the Stock Point and held in inventory. If this radio could not be repaired then a new radio was purchased with APN money. During the process, the Squadron, the real end user, was not charged anything for this radio.

This process was considered a "free issue" to the squadron. The cost to AIMD was only for the parts and labor to fix the old radio not for the cost of the new radio, an RFI unit. The cost for the repair of the old radio was funded by O&M,N money as a mission funded responsibility. When the RFI unit was issued by the stock point, a "complete" radio was required to be turned into AIMD or the DOP. A "complete" radio was one that had all the parts and circuit boards inplace, even though it did not work. This *requirement* to turn-in a radio was not always followed. If the radio was obtained by the squadron during a high tempo of operations, the old radio was not always available. The squadrons sometimes requested a new radio while they were taking the old radio out of the aircraft. There was no tracking system to follow up and see that the old radio was returned. When a radio was not returned, ASO paid the 5,000 dollars and the inventory was reduced by one radio. The process was described for just one line item; there are 54,000 line items in the AV-DLR system. The potential for "leaks" from the system was significant.

D. PROBLEMS IN THE AV-DLR PROCESS

The "free issue" environment gave no incentive to the squadron to effectively trouble shoot their equipment. If the equipment did not work, the squadron could just

pull it from the aircraft and send it to AIMD. If AIMD had a piece of equipment, the squadron could install the new piece of equipment with no cost incurred. The same lack of incentive was present at AIMD. If AIMD was busy, they could just send the gear to the DOP. In fact, this was probably cheaper to AIMD as they did not have to spend any money trying to repair the item. This "free issue" problem lacked management incentives and was targeted for correction.

The lack of a tracking system for inoperable equipment which had not been turned-in also created a big problem. Squadrons stock piled equipment that ASO did not know existed. This non-RFI equipment was not being returned, therefore not being repaired, thus depleting the inventory.

There was also a problem with funding that needed to be corrected. APN money was used to purchase the equipment and then O&M,N money was used for repair and transportation. The APN money, being investment type appropriations, had a three year lead time which created problems with forecasting. The O&M,N money was from a completely separate one-year appropriation. Subsection 1301 of the 31 USCA states:

> Except as otherwise provided by law, sums appropriated for various branches of expenditure in the public service shall be applied solely to the objects for which they are respectively made, and for no others.

The Navy did not have the flexibility to move the money from one appropriation to the other without getting approval from Congress. This often was a very time consuming process.

E. NEED FOR CHANGE

The problems just identified caused concern and brought inquiries to the Navy from both the Office of the Secretary of Defense (OSD) and the General Accounting Office (GAO). These inquiries led the Vice Chief of Naval Operations to direct that a study be done to evaluate alternative funding mechanisms for DLRs, in May 1978. This study considered three alternatives:

(1) Funding the procurement and repair of DLRs in a single appropriation.

(2) Funding the procurement and repair of DLRs within the existing procurement appropriations.

(3) Funding the procurement and repair of DLRs in the Navy Stock Fund.

The study concluded that the Navy Stock Fund was the best funding vehicle to use for the procurement and depot level repair of the DLRs. The following reasons were given: [Ref. 14: p. 1-2]

(1) Improved supply system discipline resulting from the buyer-seller relationship inherent in a stock funded environment instead of the "free issue" procedure.

(2) Improved financial flexibility, due to the ability to trade-off procurement and repair during budget execution.

(3) Improved budget forecasting due to shorter stock fund budget lead times.

(4) Improved material support responsiveness due to the stock fund's ability to respond to emergent requirements without the need for reprograming action.

This decision led the CNO, in May 1979, to direct that a prototype program be implemented to test the stock funding of DLRs. In April 1981, the non-aviation DLRs were capitalized into the Navy Stock Fund by SPCC. A test period of two and one-half years was setup to evaluate the program prior to converting AV-DLRs. A preliminary evaluation, in 1982, was so favorable on the conversion by SPCC of its DLRs, that in December 1982 the CNO directed that the AV-DLRs be converted to the NSF as well. [Ref. 14: p. 1-3]

F. NAVY STOCK FUND

To better understand the reason why the NSF was selected as the financial vehicle for the funding of the AV-DLRs, an explanation on the NSF is presented. The NSF is the oldest of all the DOD Stock Funds. It was established in 1893 by the Navy Supply Act. It is a revolving fund that finances inventory and is reimbursed by customers when they draw on the inventory. In this regard it is a working capital fund and the items are held at the stock point until required. The concept of a stock fund is that once it is setup, the customers will then maintain it with their funds. The goal of this type of fund is to cover all costs and work to a zero profit. The Office of Management and Budget (OMB) controls the stock fund operations through the apportionment process. OMB issues obligational authority to the stock fund and is not restricted on a quarterly basis as appropriations are. The stock fund manager is also authorized to convert commitment authority, which is an apportioned amount of flexibility in allocating funds, if the demand warrants it. The Navy Stock Fund manager is the Commander, Naval Supply System Command (NAVSUP), who delegates the responsibility for the aviation parts to ASO, the Budget Project Manager for the AV-DLRs. NAVSUP does issue the money on a quarterly basis, but can issue more to ASO without having to go to Congress.

This type of fund allows the Navy to divert money as it sees fit, without having to go through the reprogramming process. The forecasting for the budget is accomplished annually with continuous refinement and allows for greater accuracy

than did the three year budget forecasts for the APN appropriations. The NSF allows the managers to manage the money without having to go to Congress when problems arise. This description supports the choice by the Study Group to use the NSF to correct most of the problems with the AV-DLR process.

G. SUMMARY

The purpose of this chapter was to describe the AV-DLR process and identify problems with that process prior to the conversion to the Navy Stock Fund. First, AV-DLRs were defined and specific examples for the different categories of AV-DLRs were presented. Second, the exchange process for a given piece of equipment was shown. This included the accountability, or lack of it, that was provided in the AV-DLR process. Third, the problems associated with this process were listed, which resulted in the studies conducted to correct these problems. The recommendation to convert to the NSF was examined. Fourth, a description of the NSF was presented. The benefits listed, supported the recommended conversion to the NSF. The next chapter will look at the implementation process that was undertaken in converting the AV-DLR funding to the Navy Stock Fund.

V. AVIATION DEPOT LEVEL REPAIRABLE IMPLEMENTATION PROCESS

A. GENERAL

The last chapter presented the history of the AV-DLR process and indicated the need for change. This chapter will look at the change that was implemented. The change in funding requirements and accountability will be discussed. The personnel hired to support the new program will be presented. Then the measures that are being used to evaluate the effectiveness of the system will be listed. The information in this chapter will provide the basis for the conclusions and recommendations that will follow in the next chapter.

B. BACKGROUND

As was stated in the last chapter, the CNO directed that the AV-DLRs be converted to the NSF. A target date of 1 April 1985 was established for the conversion. The AV-DLR items were reviewed to see which ones would fit into the stock funding format and which ones should be transferred to end-use (EU) funding and ownership. [Ref. 15: Enc. 6, p. 1]

The following criteria was used to determine if an item should fall into the EU category:

(1) There is a clearly defined program for the installation of end items.

(2) Future requirements are based on known program data, not demand.

(3) Replacement of end items is controlled and will occur only when upgrading or refurbishing or due to unexpected damage.

(4) End items do not have a next higher assembly.

(5) The only procurements, other than to support planned program requirements, are those required for insurance purposes.

Items with these characteristics are funded primarily on how they relate to specific programs rather then on customer usage. Those items are not compatible with NSF procedures and therefore they were not converted to the AV-DLR cog. [Ref. 14: p. 12-1]

The 2R and 8R cogs that were listed in Figure 4.1 were converted to a AV-DLR cog family that is funded by the NSF. This new cog family was listed as 7R and included approximately 54,000 line items. [Ref. 15: Enc. 6, p. 1]

C. IMPLEMENTATION

1. Funding

On 1 April 1985, the newly formed 7R cog family was placed in the NSF. This required that the funding programmed in POM-85 for the procurement and operating appropriations of these items be decremented and the funds reprogrammed to customer accounts in the form of O&M,N funds. Now when AV-DLRs are requisitioned, customer funds will be obligated because of the NSF revolving fund criteria. This money was reprogrammed to the Flying Hour Program (FHP) Operation and Maintenance, Navy funds. These funds are divided into Aircraft Flight Operations (AFO) money and Aircraft Operations Maintenance (AOM) money. The funds for the AV-DLRs falls into the AOM money. To indicate the magnitude of this conversion of funds, the 1986 fiscal year AFO costs for Petroleum, Oil, and Lubricants (POL) to be consumed in the operations of all naval aircraft was 689.275 million dollars; the 1986 fiscal year budget for AV-DLR costs was 985.261 million dollars [Ref. 13]. The AOM money had been primarily for Aviation Fleet Maintenance (AFM) funds. Now the reprogrammed AV-DLR money was included in AOM money. Figure 5.1 indicates the breakdown from the Secretary of the Navy to Nas Moffett Field for fiscal year 1986 AOM funds.

	AFM	*AVDLR*	*TOTAL*
Secretary of the Navy	535.4 M	985.3 M	1520.7 M
Commander Naval Air Force U.S. Pacific Fleet	290.8 M	511.7 M	802.5 M
NAS Moffett Field	9.2 M	18.6 M	27.8 M

Figure 5.1 AOM Funds, FY86 Breakdown (millions of dollars).

This money was granted to NAS Moffett Field as an Operating Budget and was a major increase to their total AOM money. As was stated in Chapter 3 this budget carries with it Section 1517 responsibilities. The NAS could issue the money to the individual squadrons under their command in the form of an operating target (OPTAR). An OPTAR does not carry Section 1517 responsibilities with it.

There are a number of problems with using an OPTAR that will be addressed. A squadron only draws an OPTAR from the Naval Air Station while they are at the NAS. When a squadron deploys, any money that is left in their OPTAR is returned to the NAS and is reissued to the squadron that is returning from deployment (there is normally a constant number of squadrons that are supported by an air station). The requirements for each squadron would be different and the OPTARs would have to be adjusted accordingly. Some variables that would have to be considered are:

(1) The age of the aircraft - the older they are, the higher the costs would be;

(2) Rate of flying - the higher the operational tempo, the higher the costs;

(3) Type of flying - the ratio of operational flights to training flights, where the higher number of operational flights would produce higher costs;

(4) Operational delay - heavy operations could influence AV-DLR costs in future months as well as the present one;

At the present time, the NAS does not issue the AV-DLR money in the form of an OPTAR at the squadron level. This decision will be discussed in more detail in the next chapter.

2. **Price Structure**

A price structure charging the customer for the AV-DLRs had to be implemented to recover the costs to the NSF. A tracking system to ensure that "complete" non-RFI AV-DLRs are returned promptly also had to be implemented. A system was established that would handle both requirements.

The first requirement was to establish a procedure to ensure that the non-RFI AV-DLR units, these units were termed carcasses, could be tracked effectively. This "enhanced" carcass tracking system was to be in operation prior to the 1 April 1985, AV-DLR conversion date. When SPCC converted their DLRs to the NSF, they developed a carcass tracking procedure. This procedure only tracked the carcass to the first receipt Transaction Item Reporting (TIR; ctivity, not to the final Designated Support Point (DSP) or to the Designated Overhaul Point (DOP). This limitation was recognized and the need to track the item to the final DSP or DOP was incorporated into the AV-DLR system. [Ref. 16: p. 5-1]

An incentive to return a carcass promptly was introduced by the price charged when an item was drawn from the NSF. A two price system was established, requiring the customer to pay a Standard Price or a Net Price as defined below:

(1) Standard Price (Procurement Price + NSF Surcharge + DOD Price Stabilization Factor) Obligated by the user and billed by the wholesale manager when a non-RFI unit is not to be turned in.

(2) Net Price (Repair Price + Depot Washout + NSF Surcharge + DOD Price Stabilization Factor) Obligated by the user when an non-RFI unit is being or *intended* to be, turned in by the customer. The "complete" non-RFI carcass has to be returned to the DOP.

Any activity which fails to turn-in the carcass after 96 days will be billed for the differential price between net and standard. These prices are determined by ASO and they have to recover all the expenses to the NSF, which include the cost of procurement, repair, transportation, and loss of the items. The Net Price is around sixty percent less then the Standard Price, so the incentive to return the items is now there.

The new AV-DLR process can be examined again using the five thousand dollar radio. Since that was the purchase price, ASO might set the Standard Price at six thousand dollars and the Net Price at twenty-four hundred dollars. The squadron turns in the broken radio and draws an RFI unit from AIMD. This unit came from AIMD's inventory so there is no charge to the squadron. Again, AIMD trys to repair the broken radio, carcass. If AIMD is able to fix the radio, then the radio will be placed back into the inventory and there is no charge from the NSF. The cost of repair to the squadron and AIMD is the same as it was prior to the conversion. The change comes into play when a carcass is determined to be Beyond Capability of Maintenance (BCM) by the AIMD. At this point the AIMD will draw an RFI unit from the Stock Point and will send in the non-RFI unit to the DOP. The AIMD will be charged the 2400 dollar net price. If the DOP does not receive a "complete" carcass within 75 days of when the RFI unit was issued it sends out a follow-up request. The AIMD then has 21 days to respond and if the unit is not delivered, the Standard Price will then be charged (i.e., the 6000 dollars).

This carcass tracking system has not been in place very long and the heavy demand on the system has created problems with the accountability of the program. A recent review of over 5000 items that were BCM and sent to a DOP, less then half had the paperwork for the accountability completely correct. That means that over 2500 items could be charged at the standard price if the paperwork can not be corrected. [Ref. 17]

3. **Personnel**

This program not only changed the funding process but also called for an efficient and effective carcass tracking program. An increase in manpower was required to run this program properly. The Navy's manpower requirements come from

the Ships Manpower Documentation (SMD) system, the Squadrons Manpower Documentation (SQMD) system, and the Shore Requirements, Standards, and Manpower Planning System (SHORSTAMPS). The SMD and the SQMD evaluate current work load, therefore new billets can only be added after they are justified. The SHORSTAMPS evaluates work load tasking and can authorize additional billets to meet the increase required by this change. [Ref. 14: p. 8-1]

The Major Claimants requested 253 personnel and 17 were not recommended. This number includes all personnel hired to implement the new carcass tracking system. Only 145 were hired in fiscal year 1985, when the carcass tracking system was to have been fully implemented and running effectively. This was a relatively small number of personnel to organize and implement the accounting of over 54,000 line items and the implementation of a new carcass tracking system where there previously was none.

4. **Measurements**

A measurement system was identified to measure the effectiveness of converting the AV-DLR funding to the Navy Stock Fund format. This system was designed to measure the supply effectiveness in providing improved AV-DLR availability while minimizing the effect of outside influences. To do this a baseline of data had to be established prior to the conversion date. Data was collected from April 1984 and will continue to be collected until April 1987. The measurement tools identified for this evaluation and how they relate to the process follow. [Ref. 14: p. 9-3]

a. System Material Availability (SMA)

The SMA indicates the percentage of requisitions that are filled for an item from anywhere in the supply system. The item may not be at the local stock point, but an RFI unit is available for issue. As carcasses are properly returned to the DOP, the availability of RFI units within the system should go up.

b. Demand and Requisition Frequency

This information can be obtained by examining the Recurring Demand (RD), the recurring Requisition Frequency (RF), and Non-Recurring Demand (NRD). This information will indicate how the demand, by the end user, might be affected with the loss of the "free issue" procedures that had previously existed.

c. Carcass Return and Survival Rates

This information will be provided by the Carcass Return Rate (CRR) and the Survival Rates (SR) and is provided in both units and dollar weights. These rates will again provide information of a recurring nature for the items.

d. Procurement Lead Times and Repair Turnaround Time

The Procurement Lead Time (PLT) and the Repair Turnaround Time (RTAT) need to be analyzed. These items influence the supply system effectiveness and could cause misleading results if they change significantly during the evaluation process.

e. Level of Repair Execution

This is another measure that has to be considered when looking at the overall effectiveness of the supply system. The amount of money that ASO has to spend on repairs is also critical. If ASO is operating at Level Four, which means that all requirements are fully funded, then the effectiveness of the supply system should be very high. Comparing the system after conversion to a period where ASO was in Level Four could also have misleading results.

f. Average Days Delay

This information is provided in the Average Days Delay for Delayed Requisitions (ADDDR) Reports. As the number of carcasses are returned to the system this number should go down, increasing the effectiveness of the supply system.

g. Response Time for NMCS/PMCS Requisitions

High priority items, that are not available from Supply, affect the operational effectiveness of a squadron. These items impact on readiness, and are placed in two categories:

(1) Not Mission Capable - Supply (NMCS)

(2) Partial Mission Capable - Supply (PMCS)

One of the reasons stated for this conversion was to obtain higher readiness, as the delay in the response times to these requisitions goes down, readiness will go up.

h. Subsystem Capability Impact Reporting (SCIR)

This measure provides more detailed information than the last section, as it provides information in a number of categories. These categories include Fully Mission Capable (FMC), Mission Capable (MC), Partial Mission Capable Supply (PMCS), Partial Mission Capable Maintenance (PMCM), Not Mission Capable Supply (NMCS), and Not Mission Capable Maintenance (NMCM). This measure gives a better picture on readiness and to what degree supply plays in the problem.

i. Cannibalization Rates

This number indicates the amount of working parts that are moved from one aircraft in order to fix another aircraft. If one aircraft is ready to fly and a radio

brakes, a working radio will be removed from another aircraft if an RFI unit is not available at AIMD or the stock point. Cannibalization should be a last resort for the squadron and a high rate would indicate an ineffective supply system.

j. Awaiting Parts (AWP) Rates at AIMDs

AIMDs try to repair the AV-DLRs when the units are turned in by the squadron. They will work on items which might require a part in order for it to be fixed. With the higher cost to the AIMD to send the item to the DOP, they may now hold items longer to fix them. It is a lot cheaper to pay 100 dollars for a part and wait one month, then to pay 2400 dollars to get an RFI unit in two weeks. The trade off is that an RFI unit is out of the inventory for two extra weeks.

k. Retrograde Time

The amount of time that it takes from submission of a requisition for an item and when the carcass actually arrives at the DOP. There had not been any type of carcass tracking system prior to 1981, so this measure is relatively new.

l. Summary of Measurements

The measures that have just been discussed were all in existance prior to the conversion date. The goals of these measures were to determine the effectiveness of the conversion of the AV-DLR funding to the NSF. Of the four stated objectives, these measurements only apply to one. That objective was to improve material support responsiveness due to the stock fund's ability to respond to emergent requirements without the need for reprogramming action.

Three of the measures captured "readiness". These measures are the NMCS, PMCS, and the SCIR and they are very close to a true measure of fleet aircraft readiness. The demand and requisition frequency measures will indicate a change in the end user utilization if there is one. There are two measures that will indicate any changes to outside factors that must be considered when evaluating the effectiveness of the conversion. These measures are the level of repair execution and procurement lead times. If the effectiveness of the system indicates improvement, however ASO has gone from level one to level four in funding, the increase in effectiveness may not be a result of the conversion.

The remaining eight measures all capture the "effectiveness" of the system and will answer the question if the conversion has met that one objective. Not one of the measures really indicates the efficiency of the system. There also were no new measures developed to evaluate the conversion.

D. SUMMARY

The purpose of this chapter was to describe the implementation process of converting the funding of AV-DLRs to the Navy Stock Fund. First, the background on how items were identified for inclusion in 7R cog family, which is made up of the AV-DLR items. Second, the magnitude of the funding conversion was shown. The impact to the funding level at the Naval Air Station on AOM funds was discussed. Third, the implementation of the AV-DLR process was examined. The two price structure, the net price and standard price, that was used to correct the previous "free issue" theory was presented. Fourth, the extra personnel that were added to implement the program were addressed. Fifth, the measures that were identified to determine the effectiveness on the supply system by the conversion of the AV-DLR funding to the NSF were listed. The following chapter will examine the overall process and evaluate the measures that are being used to assess the system.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. GENERAL

The goal of this thesis is to evaluate the conversion of the AV-DLR funding to the Navy Stock Fund. The preceding chapters have laid the foundation on which conclusions and sound recommendations can be formulated. Conclusions are drawn from the items that have already been addressed. Based on these conclusions recommendations for these same areas are presented. The recommendations should result in an increase in the effective and efficient utilization of limited resources in obtaining higher fleet readiness. As with any dynamic situation, suggestions for future study are listed.

B. OLD AV-DLR SYSTEM

There were a number of problems associated with the AV-DLR program prior to the conversion of the funding to the Navy Stock Fund. These problems are addressed along with conclusions and recommendations.

1. Control Principles

The AV-DLR program lacked some of Koontz and O'Donnell's control principles. One principle, described in Chapter 2 as the Control Principle, stated that the primary responsibility for the exercise of control rests with the manager that is charged with the execution of the plan. ASO was paying for the AV-DLRs that squadrons were using and that AIMDs were repairing. When the squadrons or AIMDs were inefficient, ASO had to pay for it. ASO had little control over the end user and any action taken could have a major impact on readiness and might not affect the squadron or AIMD that created the problem.

This was not a very sound management practice and would create inefficiencies in the total system. The new procedure will enhance the end user responsibility on the AV-DLR process. This is a desirable affect in a superior management system. It is therefore recommended that the responsibility be placed at the lowest level where the manager has control of the process and the benefits are greater then the costs.

2. **Flexibility of Control**

The Flexibility of Control, which states that for controls to remain effective, despite failure or unforeseen changes of plans, flexibility must be in their design, is another Koontz and O'Donnell principle that was lacking. The ridged budget structure, where procurement money was in APN dollars and repair money was in O&M,N dollars, did not allow ASO or the Navy in general to have that flexibility. In the past ASO was given the money to procure and repair AV-DLRs. The limiting factor was the amount of procurement money appropriated (i.e., APN funds). The repair money which was appropriated (i.e., O&M,N funds), could be moved around within the Navy without obtaining Congressional approval for reprogramming.

The Navy's flexibility was encumbered when they needed to move funds from the APN account to the O&M,N account because Congressional approval is mandated. The same was true if funds had to be diverted from the O&M,N account to the APN account. Therefore the consolidation of the procurement dollars and the repair dollars to a single fund is a very desirable objective. To correct this lack of flexibility with the funds, the NSF conversion was the appropriate choice.

3. **Turn-in Accountability**

The lack of turn-in accountability for carcasses was one of the biggest causes of inefficiency in the system. If an item was not turned-in at the time of issue of the RFI unit, there were no procedures established that would follow up to ensure that the items were returned. There was no real incentive for the squadrons to return carcasses to the system, which caused non-RFI parts to remain in squadrons. Instead of being repaired and placed in an RFI condition the non-RFI AV-DLRs, that were not turned in, depleted the inventory at the stock points and AIMDs. The real limiting factor affecting overall readiness is the number of RFI parts that are available in the system.

To increase the availability of RFI units in the system a carcass tracking system had to be implemented. A carcass tracking system requiring accountability from the end user to the DOP is recommended.

4. **Measures and Standards**

Prior to conversion to the NSF there were no specific performance standards established for AV-DLRs at the squadron or AIMD level. The "free issue" concept at the end user level had a negative affect on ASO's ability to maintain an effective and efficient AV-DLR program.

It was mentioned earlier that in a non-profit organization it is not always possible to measure output and that it might be appropriate to measure an input such as cost. The cost can then be used in determining how effective and efficient an organization is. For this reason, the budget has played a critical role in the non-profit organization such as the military. The AV-DLR process was based on this policy. Each year money was allocated to the AV-DLR program based on historical data. One of the major inputs to the annual requirement was determined by the number of flight hours forecasted. As flight hours went up the AV-DLR costs would go up. The effectiveness or the efficiency with which this money was spent was not really measured.

The use of cost as a measure was one option listed, however a number of surrogate measures can be used. This system did have a number of surrogate measures that required an immense amount of paperwork. The measures that were listed in Chapter 5 to determine the effectiveness of the AV-DLR conversion process were all in place prior to the funding change. The SMA, the ADDDR, the NMCS, the PMCS, the SCIR, the RTAT, the cannibalization rates, the AWP rates at AIMDs and the retrograde times provide managers with a lot of information. This information does not indicate how efficient the system is. The more money that is placed into the system, the higher the numbers or ratios would be, thus indicating an efficient system. Managers did not have specific performance standards set that would encourage the system be operated in an efficient manner or to determine actual performance results. If standards were set, they would only be valid at a given funding level, because as funding levels were increased the standards would have to be raised to maintain the same level of effectiveness and efficiency.

The desired output from an effective and efficient AV-DLR program is high fleet readiness [Refs. 14,15]. The measures that have been listed primarily try to determine readiness. The results from these measures could indicate a very high level of readiness while the AV-DLR process is very inefficient. The opposite could also be true, where readiness is low, but the AV-DLR process is very efficient. Readiness, as an output measure, is too far removed from the AV-DLR process to be useful as a specific measure.

5. Management Control Process

The squadron manager, the AIMD manager and the NAS manager were not concerned with a management control system prior to the conversion of the AV-DLRs

to the NSF. The squadrons required the parts and ASO provided the funds, if the squadron was inefficient it did not impact them. This procedure led to the "free issue" policy that was described previously and caused inefficiencies in the system. The managers were not responsible for any AV-DLR funds, so they were not concerned with their performance with regard to AV-DLRs. For this reason a management control process was never developed for the AV-DLR system. Without concern by managers, an efficient management control process would not have been developed. The AV-DLR funding conversion to the NSF places that concern directly on the AV-DLR managers. Recommendations for improvement to the management control process is discussed under the new AV-DLR system.

6. **Summary of Old AV-DLR System Recommendations**

The conversion of the AV-DLR fund to the Navy Stock Fund was an appropriate decision. The control responsibility was placed on the manager charged with the execution of the plan. The flexibility of control was enhanced by the funding being placed completely in a revolving stock fund managed at a headquarters level. The managers can now move money from repair to procurement or from procurement to repair depending on the needs of the Navy. This allows funds to be reprogrammed without having to go through Congresss. This was a significant improvement to the system and allowed the managers greater flexibility to optimize their resources.

C. NEW AV-DLR SYSTEM CONCLUSIONS

1. **Accountability**

Now that the AV-DLRs are funded by the NSF and the end user is being charged for the items, cost is again an important measure. However, there are two areas that should be of concern. First, how often a particular squadron is charged for AV-DLR items. A squadron is only charged for items that are not turned in as "complete". The squadrons are normally co-located at a Naval Air Station that has an AIMD. When an AV-DLR breaks at the squadron level, it should immediately be turned-in to the AIMD. This quick turn-in process and the fact that the squadron is so close to the AIMD allows for tight control of the AV-DLR carcasses. An effective and efficient manager should *never* be charged for an AV-DLR unit because they only exchange broken units for RFI units. The squadrons are not issued new units from the AIMD.

This procedure may still seem like a "free issue" for the squadron but another measure should be considered. When an AV-DLR is returned to the AIMD, the unit is examined. If the unit works properly or only requires a minor correction, one that the squadron should have performed, the item is returned to the inventory in an RFI condition. The discrepancy is signed off as A-799. This "A-799 sign-off" indicates that nothing can be found wrong with the gear. This situation causes inefficiencies in the system that should reflect on the squadron manager that turned in the unit. The incentive for squadrons to closely trouble shoot problems will be increased if the A-799 sign-offs are used as a control measure.

2. **Price Structure**

The net price and standard price structure that AIMD is charged for turned in AV-DLRs provides the incentive to return "complete" carcasses to the DOP. The manager's effectiveness can be measured by how many items are charged at the standard price. Items that are lost or not turned in create leakages in the system which lead to inefficiencies. The RFI units are drawn for inoperative units and therefore should *always* be charged at the net price. The review that was conducted on the AV-DLRs and reported in the previous chapter, indicates that there is a significant problem with the carcass tracking system. The documentation on over half of the items turned in are not complete and can cause excessive standard prices to be charged. This induces a large error into the data for the evaluation on the effectiveness of the AV-DLR funding conversion to the NSF. This error will not be detected with the present control measures.

3. **Carcass Tracking**

The planned start date to implement carcass tracking for AV-DLRs was November 1984 [Ref. 18: App. A, p. 1]. This applied to over 54,000 line items and only 145 personnel were hired Navy wide in fiscal year 1985 for this process. This system was to be fully operational prior to the planned conversion date of April 1, 1985. The successful implementation of this carcass tracking system was not determined prior to that date [Ref. 13]. The initial results of the reviewed items indicate that the carcass tracking system still has significant problems [Ref. 17]. Until this system can be successfully implemented, no determination on the effectiveness of the AV-DLR funding conversion should be reached.

4. Control Process

In Chapter 2 a five step model for the "ideal" management control process was developed. To review that model, the five steps were:

(1) set performance standards consistent with the planning objectives;

(2) design the information feedback system;

(3) compare the actual performance with the predetermined standards;

(4) determine whether there are deviations and measure their significance;

(5) take any action required to assure that all organizational resources are being used in the most effective and efficient way possible in achieving organizational objectives;

Now the need for a management control process for the squadron manager and the AIMD manager is clear. The NAS commander wants to maximize readiness for all the squadrons assigned. The budget is used to establish goals and objectives for the NAS to meet. The NAS has a minor input to the budget submission as the main input comes from COMNAVAIRPAC for the west coast Air Stations [Ref. 13]. When the planning objectives are set the performance standards can be established to obtain those objectives. Both efficient and effective standards must be set. The feedback system has to be developed, with actual performance evaluated. Deviations can be measured and corrected. The management control model can easily be applied to this system to improve the AV-DLR process within the Navy. The problems encountered with the budget in fiscal year 1986 for AV-DLR funding can be attributed to a number of reasons. The most important factor was the increase in the standard price charges for the AV-DLRs because of the carcass tracking procedure inefficiencies. As a result of the uncertainty of the charges, both the Commanders of the Naval Air Forces Atlantic and Pacific Fleets removed the Section 1517 responsibilities from the Naval Air Stations for the 1986 fiscal year. This allowed managers to fully fund their requirements and not impact readiness. Until the problems with the carcass tracking system are corrected, the budget will be ineffective as a control tool.

D. NEW AV-DLR SYSTEM RECOMMENDATIONS

1. Squadron Accountability

High readiness is the stated objective for the AV-DLR process. The current measures look at readiness in a very general way. The measures can be misleading and specific measures have to be developed to determine the efficiency and effectiveness of the process. This should start at the squadron level, where the number of times a

charge is imposed for the lack of a AV-DLR turn-in and the number of A-799 sign-offs are recorded and used as specific measures against a squadron. In previous theses [Refs. 8,9,19] it was recommended that the managers be evaluated based on the amount of funds they expended and then held accountable on their performance appraisals. The fund expenditures are subject to a number of variables and does not always reflect a true picture of the managers performance. It is therefore recommended that the measure of charges for non turn-ins of AV-DLRs and A-799 sign-offs be used at the squadron level to measure the efficiency of the manager. This information should then be used on the managers performance appraisal.

The NAS commander is issued an operating budget for the AV-DLR funds. They can then issue an OPTAR to the squadron. The added time and paperwork for the NAS to issue each squadron an OPTAR and then maintain accounting records would exceed the benefits of such a system. Therefore it is recommended that the NAS not issue OPTARS to the squadrons for AV-DLR funding.

2. **AIMD Accountability**

The previous recommendation will leave the AIMD as the end user that the NSF charges for the AV-DLRs. Since the squadron and the AIMD are funded with the same operating budget from the NAS, this is not considered to be a problem. The "free issue" view of the AV-DLR process to the squadron has changed. Now if the squadrons are inefficient, not only will they be charged for not turning units in, they could feel the impact with losses in O&M,N money that was previously funded for fuel. The AIMD has to minimize leakages to the system and provide accountability for the AV-DLRs, to be efficient. A control measure based on the number of times that an AIMD is charged the standard price for the AV-DLRs should be developed. A ratio of the number of net price charges to standard price charges would be appropriate. The higher this number the higher the efficiency. The control measures that are currently in place on readiness, will continue to provide information on effectiveness.

3. **Carcass Tracking**

The carcass tracking system must be evaluated. If the problems identified earlier are Navy wide, then a complete review of the carcass tracking system procedures should be undertaken. This review should start with the number of personnel assigned to accomplish the task. At one Air Station, over 10,000 items were returned to the DOP during the year. Now that the work load has been established a review of personnel requirements should be simplified. The benefits to this program

will not materialize until the carcass tracking system is considered tight (i.e., little or no leakages). It is therefore recommended that any determination on the impact of the AV-DLR funding conversion to the NSF not be made until a successful enhanced carcass tracking system is fully operational.

4. **Budget**

The control measures that have been recommended so far will provide information to the managers on how effective and efficient the AV-DLR system is. When an efficient system is in place, forecasting is more predictable. The more accurate the forecast, the higher the reliablity of the information in developing a budget. The budget is a very important control measure for the non-profit organization as stated previously. It is the measure that Congress requires in order to appropriate money to the Navy. The accuracy of the budget will determine the amount of money and the ease with which Congress will appropriate the required funds to the Navy. When the fund request can not be supported with proper documentation, Congress will restrict the funds.

The budget has to be based on sound information. The budget input should start at the NAS level and be formulated in order to meet the planning objectives. The performance standards that are presently in place to determine readiness can be used to evaluate the effectiveness of the system. The new measures on squadron turn-in charges and A-799 sign-offs and the AIMD standard price reports should be used to determine the efficiency of the system. The feedback system on the effectiveness measures are already in place and the new measures can easily be included on monthly reports. The actual standards desired to meet the objectives need to be developed so that managers can monitor any deviations. The early detection of these deviations will allow corrective action to be taken so that an effective and efficient system can be maintained.

This control process will provide Congress with the information that they require (i.e., the budget) to continue to Appropriate money for the AV-DLR program. The budget will be determined using sound information from an efficient and effective system. This will give the budget the creditability that it needs in Congress. The new control tools should be used by the Navy managers to evaluate their performance. The Section 1517 responsibility can again be assigned to the managers at the Naval Air Station when a realistic budget is submitted. An accurate budget is the key to this system, and that will happen when the managers run the system at the most efficient and effective level possible.

E. SUGGESTIONS FOR FUTURE STUDY

1. AV-DLR Carcass Tracking System

A study should be conducted on the AV-DLR carcass tracking system. If the carcass tracking system is inefficient any results derived from the data obtained on the funding conversion would be misleading. If the system is determined to be inefficient, the data collection period for the funding conversion evaluation should be extended. The data collection period to determine the effectiveness of the conversion to the NSF ends 1 April 1987.

2. AIMD Work Load

There is now an incentive for the AIMD to repair as many AV-DLRs as possible. The AIMD is only charged by the NSF for items that are BCM and returned, as a result the AIMD will work harded to repair them. The number of items repaired by the AIMD and its work load prior to and after the funding conversion should be evaluated. This unexpected result from the AV-DLR conversion should increase the efficiency and effectiveness of the system.

F. SUMMARY

The purpose of this chapter was to provide the conclusions and recommendations of this thesis. First, the conclusions were presented. The lack of certain control principles prior to the funding conversion were identified. Certain measures and standards were then discussed. The "ideal" control process was again introduced and adapted to the system. Second, the recommendations were given. Recommendations on the funding conversion, the squadron accountability, the AIMD accountability, carcass tracking, and the control process were listed. The last section discussed areas for future study.

The recommendations in this study are intended to improve the management control of AV-DLR funds. The implementation of a management control system based upon the principles and measures set forth in this thesis, will result in more effective and efficient use of limited resources.

APPENDIX
GLOSSARY OF ACRONYMS

ADDDR	Average Days Delay for Delayed Requisition
AFM	Aviation Fleet Maintenance
AFO	Aircraft Flight Operations
AIMD	Aircraft Intermediate Maintenance Department
AOM	Aircraft Operations Maintenance
APA	Appropriations Purchase Account
APN	Aircraft Procurement, Navy
ASO	Aviation Supply Office
AV-DLR	Aviation Depot Level Repairable
AWP	Awaiting Parts
BCM	Beyond Capability of Maintenance
CINCPACFLT	Commander-in-Chief, U.S. Pacific Fleet
CNM	Chief of Naval Material
CNO	Chief of Naval Operations
COMNAVAIRLANT	Commander Naval Air Force, U.S. Atlantic Fleet
COMNAVAIRPAC	Commander Naval Air Force, U.S. Pacific Fleet
CRD	Carcass Return Demand
DG	Defense Guidance
DLR	Depot Level Repairable
DOD	Department of Defense
DONPIC	Department of the Navy Program and Information Center
DOP	Designated Overhaul Point
DSP	Designated Support Point
EU	End-Use
FHP	Flying Hour Program
FMC	Fully Mission Capable
FYDP	Five Year Defense Plan
GAO	General Accounting Office
JCS	Joint Chiefs of Staff
JPAM	Joint Program Assessment Memorandum

JSPD	Joint Strategic Planning Document
MC	Mission Capable
MP	Military Personnel
NAS	Naval Air Station
NAVMAT	Commander, Naval Material Command
NAVSUP	Commander, Naval Supply Systems Command
NMCM	Not Mission Capable - Maintenance
NMCS	Not Mission Capable - Supply
NRD	Non-Recurring Demand
NSF	Navy Stock Fund
O&M	Operations and Maintenance
O&M,N	Operations and Maintenance, Navy
OMB	Office of Management and Budget
OPN	Other Procurement, Navy
OPTAR	Operating Target
OSD	Office of Secretary of Defense
PBD	Program Budget Decisions
PDM	Program Decisions Memorandum
PLT	Procurement Lead Time
PMCM	Partial Mission Capable - Maintenance
PMCS	Partial Mission Capable - Supply
POL	Petroleum, Oil and Maintenance
POM	Program Objective Memorandum
PPBS	Planning, Programming and Budgeting System
RD	Recurring Demand
RF	Requisition Frequency

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