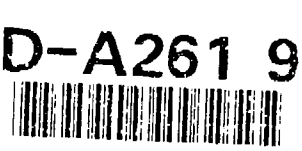

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THESIS

Flight Hour Costing at the Type Commander and Navy Staff Levels: An Analytical Assessment

by

Michael V. Edwards

December 1992

Thesis Advisor: Lawrence R. Jones

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While an overview of the individual techniques for flight hour costing lays the groundwork for this thesis, the focus of this work is on the differences in CPH formulation, variances in eventual products, and the consequences of these variances. An analysis of recently-emerging problems associated with the Flight Hour Program (FHP) and their potential significance in an era of reduced military funding is included. Additional information on the administrative programs instituted to computerize aircraft maintenance and flying hour documentation is also presented, as well as some of the implications of transitioning to a "paperless Navy". Finally, some proposed solutions are evaluated and suggestions for further study are offered to enhance the efficiency and effectiveness of the Navy's Flight Hour Program.

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Flight Hour Costing at the Type Commander and Navy Staff Levels: An Analytical Assessment

by

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This thesis is an analysis of current methods utilized to predict flying hour expenditures for budget formulation and execution purposes. This study explains, compares, and contrasts the methods for determining Cost Per (Flight) Hour (CPH) among the aviation Type Commanders (COMNAVAIRPAC / COMNAVAIRLANT / COMNAVAIRESFOR) as well as representatives from the office of the Chief of Naval Operations (OPNAV).

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TABLE OF CONTENTS

I. INTRODUCTION

A. BACKGROUND

The U.S. military is shrinking. A combination of legislative mandates, a dynamic geopolitical evolution, and fiscal reality portend an era of restraint, review and reevaluation. Reductions in force structure, service capabilities, and strategic tasking are inevitable. It is the duty of leaders at all levels of the Department of Defense to ensure this drawdown occurs in a rational and non-destructive manner. Their primary responsibility is to ensure that, whatever the resultant size of force available or the assigned mission, those units called upon are up to the task at hand. The combat readiness of individual units *must* remain the primary goal and focus during this period of global, as well as internal bureaucratic, instability.

> The ability of the Navy to perform its missions effectively is critical to the defense of the nation and its success in wartime. To that end, it is essential that the Navy's tactical air forces, which strike naval and land targets, be flown by crews proficient in their military flying tasks. These tasks, and related ship-based take-offs and landings, are difficult and dangerous, requiring highly developed skills. The Navy's primary means of developing and maintaining these skills is hands-on training through its flying hour program, which funds the number of hours naval aircraft can be flown. [Ref. 1: p. 2]

In the Naval Aviation community, mission readiness is maintained through the continuous development and application of learned skills and tactics ("practice, practice, practice"). This is accomplished through each individual squadron's management of its allotted flight hour funding. In the Flying Hour Program (FHP), funding is determined as a product of a) the necessary flight hours required to maintain a preplanned level of proficiency in designated

mission areas multiplied by b) the Cost Per Flight Hour (CPH) of each specific Type/Model/Series (T/M/S) of aircraft. Since FHP funds, once approved by Congress, are capped, inaccurate estimates of flight hour costs during budget formulation and submission lead to inadequate availability of flying hours during budget execution. This situation can result in a degradation of both squadron and individual aircrew mission readiness.

> ...the Navy bases its flying hour budget on the operations of individual aircraft types. If the planned flying hours are based on the Navy's expert judgment of what is needed for pilots to become proficient and maintain their proficiency and if that judgment is accurate, then it is possible that variances between the planned and actual flying by aircraft type could adversely affect the proficiency and mission readiness of pilots. [Ref. 1: p. 5]

It is vital, therefore, that those activities responsible for determining the cost per flight hour are fully aware of all current factors affecting this calculation. and that they also have a firm grasp on the future implications of anticipated financial, operational, and policy changes to accurately predict expected variances.

In the past, Type Commanders and Naval Air Station comptrollers have essentially relied on historical data, with some modifications for inflation, to determine the cost per flight hour of aircraft for budget submission. With the prospect of a steadily shrinking financial base of operations, efficiency in usage and accuracy in accountability become paramount. Force controllers have expressed numerous concerns over the implications of a myriad of anticipated budgetary inputs. Examples include the following:

- In the past, a steady procurement of new aircraft injected a "vitality" or "freshness" into the data base via the inclusion of unabused airframes with full, useful structural "life". With the slowdown, or in some cases, cessation of buys, this repetitive rejuvenation of the force is absent. Historical flight hour costs would not indicate the resultant intensified aging process, providing a misleading and overly optimistic expense figure.

- With the advent of the Defense Business Operating Fund (DBOF), the inclusion of various categories of overhead in the computation of flying hour costs becomes mandatory. Quantification of direct labor costs for military personnel indicates that unit commanders can no longer be shielded from a comprehensive awareness of operational costs and budgetary restrictions.

- In a search for more efficient utilization of available resources, requisite expenditures for aircraft maintenance and repair components must be quantified more accurately.

- In light of the scarcity of funding for mission-essential flight hours, the justification of purely administrative travel, funded from the same apportionment, becomes increasingly difficult.

A markedly smaller, more cost-conscious force is predictably the Navy of the future. Areas exhibiting wasteful or ineffectual management of dwindling resources will be eliminated or replaced by programs displaying acceptable levels of potency and competence within a predetermined budgetary allowance. It is incumbent upon the Navy leadership to ensure that the resultant force structure is indeed a trimmer, more efficient military entity.

B. OBJECTIVES AND SCOPE

The main thrust of this thesis is in the assessment of current models utilized by the type commanders in determining flight hour costs and the implications of certain aspects resulting from the drawdown in forces. While inputs will be collected from the Atlantic (COMNAVAIRLANT) and Reserve (COMNAVAIRES) components, research and analysis is focused primarily on the Pacific (COMNAVAIRPAC) Fleet.

The benefits of this thesis include both evaluative and budgetary applications at the Subclaimant (Type Commander) and Fund Administering Activity (Naval Air Station) level. The resultant analysis will provide guidelines for budget control to more accurately predict variances as well as the average flight hour costs by

aircraft type. This analysis should prove useful not only in determining annual budget submission figures but in the quarterly allocation and administration of operational flight hours during the execution of apportioned funding and therefore may be useful to all Navy type commands and fleets.

C. RESEARCH QUESTIONS

The following research questions are addressed in the body of the thesis:3

1. Primary:

Are there more accurate methods than historical data to predict flight hour costs?

2. Secondary:

1. What effect will the reduction / stoppage of aircraft procurement and introduction of new aircraft into the Fleet have on flight hour and aircraft maintenance and repair spending requirements?

2. How can the maintenance expenditures and repair component costs be more accurately justified for purposes of budget formulation and execution?

3. Can the administrative travel costs within the Flying Hour Program be better justified for budget formulation? If so, how can such justification be improved?

D. METHODOLOGY

Research centers initially on archival literature, including current Type Commander directives and guidance on flight hour computation, government publications, books, periodicals, and previous theses. The primary sources of information, however, were the personal and telephone interviews conducted

with representatives from OPNAV (N-889E), NAVCOMPT, NAVAIRSYSCOM, NAVSAFECEN, COMNAVAIRPAC, COMNAVAIRLANT, COMNAVAIRESFOR, Naval Air Station Comptrollers, Active Duty and Reserve aviation squadron personnel, and various subject-matter experts.

While the research focuses on Pacific Fleet units, the resultant analysis should provide constructive suggestions applicable to all Navy subclaimants, Fleet and Reserve units.

E. ORGANIZATION

This thesis is divided into five main chapters.

Chapter I delineates the purpose of the document by providing background as to the relevance and urgency of proper flight hour costing. It states the research questions, the objectives of the analysis, the scope of the investigation, and the methodology used in researching the area, as well as the structure of the thesis itself.

Chapter II presents the various processes for determining specific Flying Hour Program (FHP) funding figures at the operational level (Type Commanders), the community sponsor level (OPNAV, N-889E), and the budgeting level (NAVCOMPT) used presently by the Navy. It also addresses the effects of budget execution dynamics on budget formulation.

Chapter III analyzes the two major methodologies for calculating Cost Per Flight Hour (CPH) utilized by the operators (the three primary Type Commanders) and the budgeteers (N-889E). The interface between the two levels, the omnipresent CPH variances, and the resultant effects on combat readiness are investigated.

Chapter IV analyzes a series of FHP-related problems and their implications in dramatic force structure drawdown where efficiency and effectiveness are prerequisites for existence. Areas covered include questions about the slowdown/elimination of new airframe procurements, increased aircraft maintenance and repair costs, and restrictions on administrative (TAD) travel.

Chapter V provides conclusions to address the research questions and the problems delineated in Chapters III and IV. Also listed are suggested topics for further research on the Flying Hour Program and related areas.

II. FLYING HOUR PROGRAM FUNDING

A. GENERAL

The Navy's Flying Hour Program (FHP) is the primary vehicle through which the Service maintains a readily available force of combat and support aircraft, aircrews, and ground support personnel. The purpose of the flight hour program is to both efficiently and effectively manage allotted resources thereby ensuring the combat capability and mission readiness of assigned personnel and equipment.

> The DoN Flying Hour Program is the instrument used to forecast, budget, and justify the resources required for the operation and maintenance of Naval and Marine Corps aircraft. The Flying Hour Program (FHP) allows the procurement strategy to be integrated into the defined maritime strategy by providing the required aircraft material readiness and trained aircrews capable of countering the threat. It is the medium through which Naval Aviation capability is transformed into readiness. [Ref. 2: p. 19]

The program is a statement of all requirements, budgeted hours, associated costs, fuel usage and readiness milestones for the forces. These factors are converted into a common denominator: dollars. [Ref. 3: p. 9] In the Department of Defense's Planning, Programming, and Budgeting System (PPBS), managers of the Flying Hour Program are aggressively involved in all phases through continuous cycles of funding request formulation, justification, and administration. The FHP has many facets covering a wide range warfare communities, levels of command, and areas of responsibility. From the scheduling and tracking of the monthly flight hours by the squadron Operations Officer; to the processing of a requisition for an aircraft repair component by the station Supply Officer; to the monitoring of unit flight hour goals by the Air Wing Commander; to the

formulation, submission, and oversight of the program budget by the Type Commander, to the testimony before Congressional hearings for budget justification by representatives from the office of the Chief of Naval Operations (OPNAV)... all are interrelated, all are essential.

B. TYPE COMMANDER INPUTS

The major coordinating and controlling operational staffs in the Flying Hour Program are the Type Commanders (TYCOM's). Located on each of the three coasts and responsible for a wide range of similar aircraft types with differing missions and area of operations, they are:

- Commander, Naval Air Forces, U. S. Pacific Fleet (COMNAVAIRPAC, or CNAP), located in San Diego, California.
- Commander, Naval Air Forces, U. S. Atlantic Fleet (COMNAVAIRLANT, or CNAL), located in Norfolk, Virginia.
- Commander, Naval Air Reserve Forces (COMNAVAIRESFOR, or CNARF), located at New Orleans, Louisiana.

Note: All three of the major Type Commanders include both Navy and Marine Corps forces. The two remaining TYCOM's which are part of the flying hour program, Commander, Naval Forces, Europe (CINCUSNAVEUR), located in London, U. K., and the Chief of Naval Education and Training (CNET, now under N7), located in Pensacola, Florida, are not considered in this work as their contribution to the program, relative to the primary Type Commanders, is relatively minor.

1. Budget Submission Procedures

The Type Commanders serve as the bi-directional filtering voice between the operational requirements of Fleet units to attain full mission readiness and the actual funding agencies of OPNAV and the Navy Comptroller's Office (NAVCOMPT). It is their responsibility to translate these requirements into monetary figures, relay them through the appropriate budgetary channels, then allocate and supervise the resultant funding to ensure full and efficient use of the

apportionments. As budgetary Sub-Claimants, however, they must coordinate these efforts through their respective Major Claimancies, their Specified Fleet Commanders (CINCPACFLT, CINCLANTFLT, and COMNAVRESFOR).

The NAVCOMPT 7111 Notice provides the Type Commanders a framework and schedule for budget submission and, through the issuance of Control Numbers, a planning limit for funding requests. The Comptroller's (or, in the case of the Reserves, Financial) Office for the Type Commander's staff then amplifies this Notice through the issuance of Activity Budget Calls for each of the Fund Administering Activities (FAA), (i.e., shore activities and operational wing commanders). This directive provides policy decisions, assumptions, and instructions based on the 7111 Notice as well as guidance generated at the command level as to projected operational and administrative commitments [Ref. 4: p. B-22].

The individual reporting units (Fleet/reserve squadrons, wing commanders, and air stations) utilize this guidance from higher echelons to prepare Budget Requests, or expected expenditures necessary to maintain full mission readiness. These Budget Requests are forwarded back through their administrative chains of command to their Type Commanders where a Force Budget is formulated. This conglomeration is then compiled into the annual budget submission for the Major Claimant and routed to NAVCOMPT via OPNAV.

2. Budget Request Components

With respect to the Flying Hour Program, budget requests are formulated on the basis of "funds required to ensure full mission readiness". The budget inputs to the Type Commander are of two major types:

1) Dollar funding requirements - for shore facilities.

2) Flight hours required - for operational squadrons.

In the first instance, comptrollers at the reporting Naval Air Stations (this also includes Naval Air Facilities and Naval Air Reserve centers for the reserve component) collect information from tenant commands for anticipated expenditures on aviation-related activities for the fiscal year in question (usually an eighteen-month to two-year projection). These include indirect costs like airfield fuel and fire truck maintenance, billeting and messing of embarked squadron personnel, and pier services for aircraft carriers, to direct costs such as the restocking of the numerous aircraft repair parts inventories or Naval Aviation Depot scheduled induction/restoration expenses. These projected expenditures are collected, categorized and correlated to specific mission areas where possible, then forwarded to the Type Commander as a Budget Request.

For squadrons, or detachment units which have aircraft assigned, funding requests are made mainly through the submission of flight hours required to maintain full mission readiness. To determine the requisite hours necessary, squadrons are primarily guided by three major documents: 1) Status of Resources and Training Systems (SORTS) Manual [NWP 10-1-11]; 2) Required Operational Capability/Projected Operational Environment (ROC/POE); and 3) Training and Readiness Matrices. The SORTS Manual, a volume of the classified Naval Warfare Publication library maintained by all combat-capable units, covers submission requirements for the primary unit level readiness report, the SORTS report. It defines specific mission area proficiency requirements necessary to achieve the various combat readiness ("C") ratings, which are subsequently reported to the Joint Chiefs of Staff (JCS). These alphanumerics

represent, in general terms, the ability of a particular unit to perform its wartime tasking by measuring its peacetime level of the following items: Personnel, Equipment and Supplies on board, Equipment Condition, and Training [Ref. 3: p. 31]. In essence, SORTS provides the military heirarchy with a comparison between resources on board an operational command as opposed to those required to undertake that unit's full wartime mission. The ROC/POE, a classified directive carried by all operational units, delineates general combat capabilities and mission areas for each Type/Model/Series (T/M/S) of naval aircraft. It categorizes basic taskings into Primary Mission Areas (PMA's) and delineates broad combat capabilities expected during wartime operations. The Training and Readiness Matrices provide more definitive guidance as to firm goals of competency levels necessary to justify a particular "C" rating in accordance with the SORTS Manual. Published as a joint COMNAVAIRPAC and COMNAVAIRLANT instruction, which is mirrored by the separate COMNAVAIRESFOR directive, they expand each separate PMA into a series of related training events [Ref. 5]. Each individual event is further broken down specifying initial qualification and currency requirements as well as flight hours and ordnance, training facilities, or support equipment necessary to accomplish that particular mission. Utilizing the information from these three sources, squadrons are able to compute the number of flight hours which will ensure achievement of 100 percent combat readiness in all assigned mission areas. This figure is then combined with the anticipated costs of assigned aircraft maintenance costs, administrative travel, and miscellaneous supplies necessary to support the unit's flight hour program, together with general operations, to

produce the total submitted to the TYCOM, via the wing commander, as the annual Budget Request.

At the Type Commander level, the type of aircraft assigned and cognizant mission area determines the maximum level, as well as computation methods, of funding requested from higher authority. Upon receipt of the Budget Requests, the TYCOM staff will reduce and combine the inputs into individual line items for each Type/Model/Series (T/M/S) of aircraft (a.k.a., Program Element [PE]), assigned to the Force. A further break down into specific Type Equipment Codes (TEC's), (a.k.a., Activity/Subactivity Groups [AG/SAG's]), also allows classification of expenditures for non-aircraft support equipment (i.e., aviator's flight equipment, aircraft engines, avionics/weapons support equipment, etc.). The financial management staff will then separate these T/M/S and TEC's into the five applicable Budget Activities (BA's) authorized for the Flying Hour Program [Ref. 2: p. 20]:

- BA-1 TACAMO ("Take Charge and Move Out"), strategic support.
- BA-2 Tactical Air/Anti-Submarine Warfare (TACAIR/ASW), Fleet Air Training, and Fleet Air Support.
- BA-3 Environmental Prediction (e.g., "Hurricane Hunters").
- BA-8 Pilot Training Rate (i.e., Training Command; Initial flight training for Pilots, Naval Flight Officers, and Naval Aircrewmen.
- BA-9 White House Helicopters.

Note: As of October 01, 1992, all aviation strategic-support forces (BA-1) have been transferred to COMNAVAIRPAC. The presidential helicopter squadron (HMX-1) is now funded through BA-2 appropriations instead of BA-9.

While the process of exact expenditure definition can become quite tedious when taken down through the levels of Program Element (PE), Activity/Subactivity Group (AG/SAG), Functional/Subfunctional Category (F/SFC), Cost Account

Codes (CAC), and Expense Elements (EE), Congressional Budget Appropriations Committees have allowed some command leeway in fund use by demanding Budget Requests delineated only to the TEC (i.e., the AG/SAG) level.

Since an average of over ninety percent of Type Commander flight hour budgets are relegated to BA-2 funding code activities, a proportionate amount of effort and emphasis is placed on accurate determination of these funding requirements. The largest share of BA-2 appropriations go to finance the Tactical Air/Anti-Submarine Warfare forces; the Fleet Navy and Marine Corps squadrons flying front line carrier-based and land-based combat and maritime patrol aircraft.

> These forces are required to maintain a level of readiness which will enable them to perform their primary mission in supporting national objectives in a moments notice, anytime, anywhere. Funding for the TACAIR/ASW program is based on the amount of aircrew training necessary to maintain a specified readiness state for each crewmember. [Ref. 2: pp. 20-21]

Although the Squadron Training and Readiness Matrices instruction consider flight crew members "combat ready" in a particular Primary Mission Area (PMA) if they have attained 75 percent of the applicable Required Operational Capability (ROC) qualification points [Ref. 5: Encl. (1), p. 1], both Fleet units and the TYCOM generally forward requests for 100 percent funding in each area with the realization that the marks and reductions will be made at the higher levels.

Fleet Air Training refers to personnel and aircraft assigned to the Fleet Replacement Squadrons (FRS) used to train replacement aircrew in specific aircraft models as they move from the training command to operational fleet units. In transitioning crewmembers from generic aviators to combat-ready replacements, the FRS's follow an approved syllabus of highly specialized ground school and training flights, tailored to differing experience levels, which

provide the replacements an initial exposure to their warfare specialties and allowing the assignment of an Entry Level Readiness (ELR) rating. This ELR rating, established by the cognizant functional/type wing, provides the eventual recipient squadron an indication of the replacement's training deficiencies and justification for additional funding requests in the budget submission to attain full unit mission readiness. (Note: While Adversary squadrons are funded under Fleet Air Training, fleet training support tasking hours, not student throughput, is the determining factor for expense calculations.) Due to the importance of the mission of the FRS's, Fleet Air Training is always requested, and generally approved at 100 percent funding levels based on approved student throughput.

The Fleet Air Support category refers to sea- and land-based support facilities utilized in providing services and logistics to the operational fleet units. Consisting of such wide ranging components as Carrier-On Board Delivery (COD) units, vertical replenishment (VERTREP) exercises, electronic warfare and threat profile aircraft, and the special operational test and evaluation units to name a few, this "cats and dogs" group provides vital training and evaluation services to the Fleet world wide yet is traditionally underfunded by higher authority despite the also traditional 100 percent Budget Request by the Type Commanders in this area.

C. NAVY STAFF INPUTS

While the individual squadron and Air Wing commanders make every effort to ensure the accuracy and completeness of their budget submissions, their main concerns are the proper management and execution of the allocated funds. The Type Commanders add a dimension of fiscal reality in prioritizing and, if necessary, reallocating the Flying Hour Program dollars within the Force. They

also are responsible for ensuring the initial budget submission is well-documented and justifiable to the Major Claimant and NAVCOMPT. The Office of the Chief of Naval Operations (OPNAV), however, is the level where the numerous components of the FHP finally congeal into one definable dollar amount, and where political reality begins to affect operational wants and wishes.

Prior to the recent reorganization at OPNAV, the Deputy CNO for Air Warfare (DCNO [AIR], OP-05) served as the program sponsor for all of Naval Aviation. The Special Assistant for the Flying Hour Program (OP-05E) was responsible for the overall management of the flight hour program [Ref. 2: p. 13]. As of Fiscal Year 1993, this office fell under the purview of the DCNO for Resources, Warfare Requirements and Assessments (N8), and was redesignated N889E. While the codes and administrative chain of command have changed, the functions of the office have not. Encompassing the roles of budgeting, coordinating, and monitoring, this office is mainly responsible for [Ref. 2: p. 17]:

- Justifying the operational and training flight activity required to meet the CNO stated Primary Mission Readiness (PMR) goals.
- Projecting future program requirements, monitoring program execution, and publishing baseline reports.
- Coordinating with NAVCOMPT in an attempt to ensure the budget actions required to meet PMR goals are accomplished.
- Maintaining open lines of communication with the Fleet and Air Type Commanders on the many highly sensitive issues relating to the FHP.
- Controlling, directing, and funding the automatic data processing hardware and software necessary to develop program requirements, budgets, and reports.

N889E is where the operational needs of the Fleet are converted into viable, executable funding programs. They serve as the translator between the impassioned, overtasked, and underfunded operators at the Fleet level,

burdened with the chore of national defense, and the meticulous, calculating, and skeptical budgeteers at NAVCOMPT/OSD/OMB charged with reducing the inefficiency and improving the effectiveness of the Department of Defense.

1. Budget Submission Modification

The staff for the Special Assistant for the Flying Hour Program (formerly OP-05E, now N889E) receives Budget Requests in support of the flight hour program through the Major Claimants. They review inputs for accuracy and conformance with the criteria delineated in the NAVCOMPT 7111 Notice. The entire FHP budget is then dissected, line item by individual line item, with an eye towards justifiability and executability of program. The total package is finally massaged for overall force benefit in view of Total Obligation Authority (TOA) prior to forwarding the Budget to NAVCOMPT.

Whereas each of the separate Budget Activities has its own unique formula for funding computation, just like the Type Commander, BA-2 is the most complicated and controversial funding activity confronted by OPNAV. Due to the critical nature of initial type training, the Fleet's demand for high-quality replacements, and the unacceptable price of a less-than-total dedication to aviation safety awareness, Fleet Air Training is supported at the 100 percent funding level requested by the Fleet. The expected TOA is determined by the syllabus flight hours and operational expenses necessary to support the predetermined student load for the fiscal year in question. Problems generated by additional student throughput, unforeseen maintenance or support facility costs, or modifications in the CNO-approved syllabus are normally addressed at the Mid-Year Review with the Major Claimant and NAVCOMPT. Fleet Air Support funding, however, is based on historical Cost Per Flight Hour (CPH) and

execution rate data. Additionally, this vital component to overall fleet readiness has been traditionally funded to fly less than 55 percent of the required support missions. This shortfall normally forces the TYCOM's to reprogram money from other areas, usually after Mid-Year Review. [Ref. 2: p. 25]

The TACAIR/ASW component of BA-2 is the area in which OPNAV has the most active participation, the least discretion, not to mention the most strident opposition from the Fleet to proposed budget cuts. In this particular category, N889E attempts to apply the administrative guidance, spending restrictions, and cost-cutting mindset of NAVCOMPT staffers in anticipation of any possible FHP reductions. With the knowledge that funds eliminated from the flight hour budget through NAVCOMPT marks are returned to the general appropriation category (Operations and Maintenance, O&M), not simply available for use by a different component of the FHP, N889E concentrates its efforts on avoiding any marks in the first place. Those line items which are not sufficiently justified by requesting commands or authorizing directives, or are simply deemed unexecutable based on available operational forces and manpower, are removed from the FHP-portion of the Budget Request prior to its submission to NAVCOMPT. It is through this action that the fiscal and political realities of the DoD budget process are injected into a document which, until that point, had been restricted only by total amounts.

2. Budget Submission Calculation

In applying NAVCOMPT consideration factors to the budget submissions for TACAIR/ASW, *for Active Duty units*, N889E utilizes a multi-step formula to arrive at an annual budgeted cost for flight operations [Ref. 2: p. 22]:

1. (Primary Authorized Aircraft per sqdn) x (Crew Seat Ratio) = Allowed Crews per Squadron

2. (Allowed Crews) x (Aircrew Manning Factors) = Budgeted Crews per Squadron

3. (Budgeted Crews) x (Req. Hrs/Crew/Month) x (12 mos.) = Annual Flying Hours Required per Sqdn

4. (Ann. Flying Hrs Req. per Sqdn) x (Number of Sqdns) = Total Annual Flying Hours Required

5. (Total Ann. Flying Hrs Req.) x (Primary Mission Readiness percentage) = Annual Budgeted Flying Hours

6. (Ann. Budgeted Flying Hours) x (Cost Per Flight Hour) = Annual Budgeted Cost, Active Duty forces (converted to "then-year" dollars)

In identifying each of the many contributing factors to a final budget request figure, inputs from many different offices within OPNAV and the Fleet are collected. These include:

- Primary Authorized Aircraft (PAA) - Indicates the number of aircraft that particular squadron should have assigned at full combat readiness; issued by the program sponsor at OPNAV.

- Crew Seat Ratio (CSR) - Established by the Bureau of Personnel, indicates the relationship of how many aircrew are required to operate one aircraft under combat conditions. Based on the TAC Fliers Model developed by the Air Force, it takes into account such things as sortie rates in wartime, crew rest, leave, sickness, injury, etc. [Ref. 6: p. 67].

- Aircrew Manning Factor (AMF) - Originally designed to provide a calculation method to properly reflect the number of aircrews budgeted per aircraft per squadron; based on manning levels and determined by the CNO, it is currently assigned a value of 1.00.

- Hours per Crew per Month (H/C/M) - Determined through the Training and Readiness Matrices instructions issued by the Type Commanders, this is the minimum number of hours per month that each aircrewman must fly in the types of missions specifically related to his warfare specialty to become and remain fully mission ready [Ref. 7: p. 55].

- Primary Mission Readiness (PMR) - Those flight hours required to maintain the average crew qualified and current to perform the Primary Mission Areas (PMA's) of the assigned aircraft: to include all weather/day/night aircraft carrier operations [Ref. 5: Encl. (1), p. 1]. It is only utilized with the TACAIR/ASW component of BA-2, not with Fleet Air Training or Support. (Note: While PMR is really a figure measured in

"flight hours", it is used in the budget formula as a "percentage" of total monthly flight hours allowed.)

- Cost Per Flight Hour (CPH) - The total of (Fuel Cost Per Hour) plus (AVDLR Cost Per Hour) plus (Maintenance and Repair Cost Per Hour). (Note: This area will be addressed in detail in the next chapter.)

During budget review hearings and, if necessary, in reclamas submitted to negate NAVCOMPT marks, the accuracy, applicability, and viability of the figures used in each one of these factors is continuously questioned or defended at all levels within the budget submission chain of command. A well-justified argument resulting in a seemingly minor percentage point alteration of one of these determinants can easily multiply into millions of dollars saved, or permanently removed, from the Flying Hour Program.

When dealing with the Reserve forces, calculation of the flight hour budget is somewhat more simplified [Ref. 1: p. 31]:

1. (Number of Reserve Aircrew Billets) x (Allotted Flight Hours per Year per Aircrew) = Total Annual Flight Hours
2. (Total Annual Flight Hours) x (Primary Mission Readiness) = Budgeted Annual Flight Hours
3. (Budgeted Annual Flight Hours) – (2.5 % Flight Simulator Time) = Annual Reserve Flying Hours
4. (Annual Reserve Flying Hours) x (Cost Per Flight Hour) = Annual Budgeted Cost for Reserve forces (converted to "then-year" dollars)

A majority of the components of this equation are fixed by statute or departmental regulation. The Number of Reserve Aircrew Billets must be approved by Congress as part of the Defense Appropriations bill. The Allotted Flight Hours allowed per aircrew is currently set at 150 hours per year for Reserve Forces Squadrons (RESFORON's). Primary Mission Readiness (PMR), which has the same meaning as for Regular aviation units, is used by the budgeteers to

proportionately decrease the budget request just as it is for the Fleet. A higher percentage of simulator time is allowed for Reservists (2.5 percent as opposed to 2 percent for Fleet aviators) due to the nature of their flying frequency and higher ground syllabus requirements for maintaining flight proficiency. The Cost Per Flight Hour (CPH) is the only true variable in the equation and is determined from Type Commander inputs delineated in Chapter III.

D. NAVY COMPTROLLER'S OFFICE INPUTS

1. Budget Submission Overview

The process to justify and fund the Flying Hour Program actually begins with the annual Budget Call by NAVCOMPT in preparation for submission of the President's Budget to Congress. Based on the Defense Guidance initiative from the Secretary of Defense (SECDEF) and Defense Resources Board (DRB), the Budget Call comes in the form of a notice (NAVCOMPT NOTE 7111) to all budget submitting activities and contains [Ref. 4: p. B-21]:

- Instructions/guidance for the content of Budget estimates.
- Submission schedule.
- Rates to use (as baselines) for inflation, foreign currency, etc.
- Differences in requirements as contained in the Department of the Navy Budget Guidance Manual.

Utilizing this information, each unit authorized a Budget Operating Target (OPTAR) submits its funding request for the next budget cycle through its administrative chain of command. (Note: Individual squadrons or units are funded through administrative limits called Operating Targets [OPTAR], while air stations are funded through legal limits known as Operating Budgets [OB]. For simplification purposes, this thesis will refer to both when using the generic term

OPTAR). These requests are collated and combined into a Program Objective Memorandum (POM) by the Major Claimants (Specified Fleet commanders) and submitted to NAVCOMPT via OPNAV. While the POM covers a six year period including prior and current year data, as well as documenting proposed changes to the Six Year Defense Plan (SYDP), only the first two years of the POM are utilized as the Budget eventually submitted to Congress.

Upon receipt of the Budget Requests from the Fleet via the POM process, NAVCOMPT will conduct a Budget Review for proper pricing and program executability. This Review may consist of informal hearings and ensures that the budget estimates [Ref. 4: p. B-51; and Ref. 7: p. 58-59]:

- Are in agreement with the POM, SECDEF guidance, and available decision documents.
- Contain current and valid costs and pricing.
- Are well justified and consistent.
- Maintain financial feasibility and balance.
- Are executable.
- Conform to legal requirements.

If NAVCOMPT finds a area in the prospective budget which appears either unjustified given the guidance previously issued, or indefensible before Congress in future budget hearings, they will propose a compensating reduction known as a "mark". The submitting activity chain of command then normally has 48 hours to justify their original submission through a reclama in order to maintain that particular line item in the budget or subsequently lose that portion of funding.

Once NAVCOMPT is satisfied with executability of the budget submissions, the Flying Hour Program is consolidated with all other inputs into a Department of the Navy (DoN) Budget and submitted by the Secretary of the

Navy (SECNAV) to the Comptroller for the Office of the Secretary of Defense (OSD). There it is combined with the flight hour programs for each of the other services and reviewed by the Assistant Secretary for Training and Readiness, the Department of Defense (DoD) Comptroller, and the Defense Planning and Resources Board (DPRB). The President's Office of Management and Budget (OMB) also conducts a joint review with OSD on the Budget, as well as any Joint Program Assessment Memoranda (JPAM), Program Decision Memoranda (PDM), or Issue Papers which may address specific budgetary problems. Once OSD and OMB concur on all funding request items, the Secretary of Defense issues the Program Budget Decisions (PBD's) which become the DoD component of the upcoming Federal Budget submission to Congress. [Ref. 7: p. 59]

2. Flying Hour Program Idiosyncrasies

Serving as both "SECNAV's Accountant" as well as "Guardian of the King's Gold", the Navy Comptroller's Office is intimately involved in all aspects of financial management within the Department. The Flying Hour Program is but one aspect of NAVCOMPT's oversight responsibility, yet requires a disproportionate amount of time in supervision and regulation. Part of the reason lies in the fact the FHP is funded from the Operations and Maintenance Congressional funding appropriation used to finance the cost of ongoing operations. This appropriation account is divided into four different categories, each dealing with a specific component of the naval service (Regular Navy - O&M,N; Reserve Navy - O&M,NR; Fleet Marine Force - O&M,MC; and Marine Corps Reserve - O&M,MCR). The period for which a legal reservation on funds, an "obligation", may be made under an O&M appropriation is one year; this is

known as the Obligational Availability Period. Regardless of the fact that the Expenditure Availability Period, the time in which all obligations must be satisfied through the transfer or disbursement of funds, is an additional five years, O&M-funded activities have but one fiscal year to obligate all apportioned funds in support of their individual flight hour programs. (Note: The actual time period to accomplish this obligation is almost always less than 12 months due to the fact that the Defense appropriations bill is usually not passed by Congress by October, the start of the federal fiscal year. In such normal cases, funds for the current fiscal year may not be obligated at a rate to exceed the previous year's appropriations, and no new programs may be funded until the applicable appropriations bill is ratified.) In any event, NAVCOMPT is actively involved in the time-compressed attempts by operational units to formulate, justify, and execute a flight hour program budget within that short period. From the original Budget Calls, to the Budget Review, submission, presentation, appropriation and follow-up Mid-Year Review in execution where budget modifications and unfunded requirements are addressed, NAVCOMPT is in a near-continuous cycle of advise and consent with the Fleet and reserve units.

Some of the more program-specific accounting factors that NAVCOMPT applies to the Navy's Flying Hour Program include execution rates, inflation rates, and withholding percentages. In monitoring planned versus actual flight hours and obligations, NAVCOMPT utilizes the Flying Hour Cost Reporting System (FHCRS), coordinating any discrepancies through the cognizant program manager. Taking the Flight Hour Cost Reports submitted by the Type Commanders, NAVCOMPT computes program execution rates by Type/Model/Series (TMS) and Type Equipment Code (TEC). This rate, a

percentage of funds obligated versus funds allocated, is then applied to future funding requests. Therefore, if a particular aircraft T/M/S is unable to obligate 100 percent of its flight hour budget, regardless of the specific units involved, reasons or mitigating factors, that T/M/S will only be funded at the achieved obligation rate as applied to its current budget request. The resultant execution percentage, multiplied by the total line item budget request, then becomes the new "100 percent" figure from which any program reductions or additions are made in eventual determination of Total Obligational Authority (TOA). The results of underexecution are explored later in this chapter.

In addressing inflation and deflation rates, NAVCOMPT covers a wide range of factors in its 7111 Notice. Among most important to the Flying Hour Program, however, are the "escalators" applied to the Maintenance (OMA, IMA, and 7F funding), AVDLR (Aviation Depot Level Repair), and Fuel costs utilized in computing Cost Per Flight Hour (CPH). While the Fuel figure is a simple percentage based on market values, the Maintenance and AVDLR figures are actually a combination of inflation factors from two different sources: 1) Sixty percent from the DoN Stock Fund (DONSF), and 2) Forty percent from the Defense Logistics Agency (DLA). These escalators are provided as general guidance to budget submission activities in the Budget Call, then updated as to the most recent market changes during the Budget Review process.

The practice of withholding a percentage of the congressionally approved Budget Authority is a method through which higher echelon commands prepare for unforeseen contingencies. In the Flying Hour Program, funds can be held in reserve at the Major Claimant, OPNAV, and/or NAVCOMPT level. These funds are simply withheld from distribution to designated commands, with the

intention that they be reinstated if they are not needed elsewhere by midyear. There is no guarantee that funds will be returned to the affected units. In fact, they could just as easily be allocated to a different unit if that unit's "need" (i.e., justification through the budget addendum process) is greater. [Ref. 8: p. 19]

E. BUDGET EXECUTION

Although numerous studies have been undertaken by such organizations as the Institute for Defense Analysis, Center for Naval Analysis, and the General Accounting Office [Ref. 2: p. 32], and conflicting theories abound, there currently is no direct or measurable method to determine cost effectiveness or spending efficiency within the Navy's Flying Hour Program. There is no way to correlate the expenditure of a dollar to an identifiable quantity of readiness purchased. One can point to the Training and Readiness Matrices as indicators of a relationship between a specific flight hour and the resultant PMA percentage point earned; then combine that figure with the T/M/S cost per flight hour to obtain a rough figure, but it's a stretch at best. Since no precise measure of efficiency and effectiveness exists for flight hours, operational squadrons can claim a need for 100 percent funding to achieve 100 percent mission readiness without fear of dissension. Conversely, since no justification for this theory really exists, NAVCOMPT has few qualms about slashing flight hour from a budget because there is indeed no correlation between flight hours and readiness.

Operational units are continuously faced with a myriad of management decisions when supervising their flight hour budget. While able to only request funding for training flights to attain 100 percent PMR, they must also perform a variety of service and logistic flights as part of general operations (e.g., inflight refueling, repositioning of aircraft to a training site, administrative travel and

billeting costs to send a maintenance man to a required safety school, etc.). This requires an eventual sacrifice in the quality or quantity of actual PMA training at some later date if additional funding cannot be justified at Mid-Year Review.

The fact that squadrons are not funded by Congress to achieve or maintain 100 percent combat effectiveness serves to exacerbate the management dilemma. In addition to the straight percentages "withheld" from the allocations by one or more higher commands as contingency reserves, NAVCOMPT does not fund TACAIR/ASW units to 100 percent PMR. The funding figures have been slowly decreasing over the last several years [Ref. 9]:

- FY 90: 87 % PMR (including 2 % strictly for funding flight simulators).
- FY 91: 87 % PMR (including 2 % strictly for funding flight simulators).
- FY 92: 85 % PMR (including 2 % strictly for funding flight simulators).
- FY 93: 83 % PMR (plus 2 % strictly for funding flight simulators).

This level of funding severely restricts a squadron's latitude in spending decisions when it comes to choices between expenditures that will result in a reportable increase in training status or mission readiness and those that are "nice to have". While it does encourage the individual units to conserve resources and aggressively monitor obligations, the resultant cost savings can often come at the expense of realistic or worthwhile training (i.e., flying fewer or less aggressive weapons delivery profiles in order to save fuel, reduction in the number of weapons carried to cut ordnance and fuel costs, substituting flight simulators for aircraft sorties, etc.).

The incentive for operational units to conserve assets is real in the fact they must make up for underfunding in relation to preparing to meet their assigned missions. There is a definite negative incentive, however, for them to attain any

real savings over and above what they can reprogram to cover FHP deficits. Any failure to fully obligate all allocated funds will have severely detrimental implications on all future funding. This is viewed as a failure to effectively manage allotted resources. Underexecution of the budget is tacit admission by the offending unit that that particular portion of the budget is in excess and can be reallocated to some more deserving and needy unit in the next budget cycle. This leads to the financial management tradition within the Navy and Marine Corps to "spend every penny" of an allotted operating target (OPTAR). This inclination becomes particularly noticeable during the fourth quarter of each fiscal year; after months of careful monitoring of the Budget OPTAR Log and tracking of obligations to ensure an overobligation violation is avoided, the squadron enters a frantic "buying spree" phase of operations as 30 September draws near (usually in aircraft fuel, lubricants, consumables, cleaning supplies, SERVMART runs, or aviator's flight gear) so as not to have any funds left on the account at years end. This perceived policy of "spend it or lose it" is a major impediment to the efficient utilization of resources in the Navy's Flying Hour Program.

F. SUMMARY

This chapter has provided a broad overview of the funding process for the Navy Flying Hour Program. The roles and influence of each of the three major levels of participants (the Type Commanders, OPNAV, and NAVCOMPT) in budget submission and execution were detailed. Chapter III will address the major component of operational flight hour funding, Cost Per Flight Hour (CPH), the various methods of calculating this factor among interested parties, and the consequences of the inevitable variances between the resultant figures.

III. COST PER FLIGHT HOUR

A. GENERAL

As described in the Chapter II, a vast majority of funding for the Flying Hour Program (FHP) is appropriated, apportioned, and allocated under the BA-2 funding category. This grouping includes the aforementioned Tactical Air and Anti-Submarine Forces (TACAIR/ASW), Fleet Air Training (mainly, FRS's) and Fleet Air Support units. In both budget submission and execution phases, these units delineate their needs and manage their resources based on a computed number of flight hours required to accomplish their assigned mission and the corresponding dollars required to support that level of activity. The BA-2-funded units will govern their obligation of available resources with a goal of achieving 100 percent mission readiness in accordance with applicable directives. This goal is usually defined by specific training objectives utilizing a predetermined number of flight hours. However, each unit is statutorily constrained as to the Total Obligational Authority (TOA) it may encompass; there is a definable financial boundary which they may not exceed, regardless of the level of combat readiness achieved. Thus, while the operating *parameters* may be in the form of flight hours, the operating *limits* are still in the only universally definable medium common to all levels of government, dollars.

Even if Congress funded these units to 100 percent Primary Mission Readiness (PMR), which it does not, differences in "requested" and "funded for" readiness levels would still occur due to the fact that each end of the financial spectrum uses a different basis for computation, that of the cost of each

individual flight hour. The inputs, externalities, and formulae used in the calculation of Cost Per Flight Hour (CPH) vary dramatically between the operational level (Type Commanders) and the financial level (NAVCOMPT; although, in actuality, N-889E performs this function). It is these differentia, and their consequential effects on combat readiness, that will be addressed in detail in this chapter.

B. TYPE COMMANDER COST PER FLIGHT HOUR FORMULATION

1. Flying Hour Cost Reporting System (Ascendant)

The Flying Hour Cost Reporting System (FHCRS) was originally designed to enable the aviation program manager (then OP-05) to monitor the program and develop estimates for program projections [Ref. 1: p. 14]. It has evolved into an administrative tool utilized by both submitting and monitoring agencies to fiscally manage program resources as well as indicate anticipated shortages/overages within their respective budgets. The system itself can be broken down into two basic areas: raw data submitted up the chain of command, and officially-massaged criteria sent back down the chain of command. Ideally, data flow and communication via the requisite reports are both bi-directional and uninhibited. In reality, however, differing priorities and conflicting agenda lead to varying interpretations and uses of the information transmitted within the FHCRS. The following section will deal with data collection and manipulation at the Type Commander level before it is forwarded to OPNAV.

2. Data Collection and Manipulation

The three TYCOM's, COMNAVAIRPAC, COMNAVAIRLANT, and COMNAVAIRESFOR, serve as collection points for the expense and costing information generated by each of the aviation-related units within their claimancy.

Financial obligations sustained by operational units directly supporting the Flying Hour Program (FHP) fall under two primary budget lines, known as Operational Target Functional Categories (OFC's) [Ref. 6, p. 32; Ref. 8: pp. 10, 21; and Ref. 11: Encl. (1), pp. 1-2]:

- OFC-01: Primarily Aircraft Flight Operations (AFO; a.k.a., FLTOPS); includes petroleum, oil, and lubricants (POL), as well as other support and maintenance material (e.g., aviator's flight equipment, administrative supplies, etc.). Also includes some minor AOM items, and Individual Material Readiness List (IMRL) item outfitting in CNAL [these items are OFC-09 in CNAP]. These costs are largely accounted for under the 7F (Fuel) and 7B (Administrative and Flight Equipment) funding codes, and are predominantly incurred by Fleet/reserve squadrons.

- OFC-50: Primarily Aircraft Operations Maintenance (AOM); includes Aviation Fleet Maintenance (AFM) consumables and repairables (which includes both Organizational level [OMA] and Intermediate level [IMA] maintenance), Aviation Depot Level Repair (AVDLR), and IMRL item repair. This category also includes AOM performed while a unit is deployed away from its home station, where it is funded by an AFM OPTAR given to the tenant maintenance facility involved. These costs are predominantly incurred by aviation-related shore facilities.

Note: The difference between OFC-01 funds and those which were budgeted solely as AFO funds is that OFC-01 funds include several items that were originally budgeted as AOM. This regrouping of funds by the Type Commander allows the squadron commanding officer direct financial control over as many costs as possible which impact on his squadron's safety. This also avoids some of the shifting in fund responsibility from ship to station each time a squadron deploys.

Totals for each of these categories, separated into Type/Model/Series (TMS) and Type Equipment Code (TEC) wherever possible, is submitted to the Type Commanders in the form of (Estimated) Flight Hour Cost Reports (FHCR's) for shore stations and Budget Operating Target Reports (BOR's) for Fleet squadrons. These reports are then utilized by the TYCOM's to [Ref. 7: p. 51]:

- Evaluate the unit's (as well as the total Force's) respective financial situations.

- Support subsequent fiscal year budget decisions and submissions.

- Measure station/squadron budget performance.
- Prepare required FHP management control reports.

Not only do tne Flight Hour Cost Reports and Budget OPTAR Reports update the Type Commander on the fiscal status of each submitting unit, they serve as another method for the station/squadron itself to confirm its financial obligational situation and ensure that dollars spent do not exceed dollars allocated; thereby avoiding a Title 31, Section 1517 violation [Ref. 2: p. 26].

Flight Hour Cost Reports (the prefix "Estimated" is used in CNAL) are submitted by shore facility comptrollers, via Priority message, sometime between the first and tenth day of the month, depending upon the TYCOM. They contain all obligations incurred during the previous month in the applicable funding codes, listed by T/M/S and TEC [Ref. 10: p. IV-7]. They are the primary source for AVDLR and Intermediate level aircraft maintenance (AFM) costing information, and obligation totals are listed as dollar amounts.

Budget OPTAR Reports are submitted each month (within the same time constraints as FHCR's) by operational squadrons and contain the following information [Ref. 6: p. 33]:

- Obligation totals for aircraft operations (AFO) and Organizational level maintenance (AFM) for that period.
- Number of operating aircraft assigned by applicable T/M/S and TEC.
- Total gallons and type of fuel consumed during the month.
- Total flight hours flown by each T/M/S, for the month and cumulative for the fiscal year.

Additionally, the BOR lists OPTAR remaining and miscellaneous accounting data from the unit's Budget OPTAR Log for comparison to reports/data from the various cognizant accounting and financial management agencies. All amounts

are listed as both monthly and "fiscal-year-to-date" (FYTD) obligation/usage totals. They serve as the primary source for AFO and Organizational level maintenance (AFM) information.

At COMNAVAIRPAC and COMNAVAIRLANT, as soon as the FHCR and BOR messages are received, the comptroller's staff input the data into the Headquarters Expense Limitation Management System (HELMS), the data base for the Flying Hour Program. (Note: The Flying Hour Cost Analysis Subsystem [FHCAS] is the actual sub-program that manipulates the data within the HELMS network. While not all of the items contained on the FHCR's/BOR's are used in calculating CPH, it *is* all used, in some form or another, at various Codes within the TYCOM and becomes instantly malleable and available to all when incorporated in the data base.) These squadron and air station inputs are combined with data from the Summary Filled Order Expenditure Differences Listing (SFOEDL) and the Material Turned Into Stores (MTIS) and Differences tape received from their respective Fleet Accounting and Disbursing Centers (FAADCPAC/FAADCLANT). A "Distribution" subprogram is run which collects information and totals on obligations/expenditures for each activity and for each TEC. Within each TEC, the data is separated into "Record Types" (i.e., fuel, maintenance and repair, AVDLR, etc.) for logical groupings and spending-type subtotals. These resultant figures are then manipulated through the FHCAS program with the output printed into a variety of local ("in-house") and externally-disseminated reports. [Ref. 12]

At COMNAVAIRESFOR, the procedures are simpler due to the smaller size of the sub-claimancy. The Financial Office at CNARF receives message input from the comptrollers at the 15 reporting sites (six reserve Naval Air

Stations, seven Naval Air Reserve Centers, and two Naval Air Facilities) at the beginning of the month [Ref. 13: pp. 10-11]. These inputs contain the same information as on the Regular Fleet's FHCR's/BOR's, broken down by tenant activity (including the squadrons home-based there) and separated into T/M/S and TEC wherever possible. Accounting information from a 7211 document is also included. Upon receipt, the financial office staff transcribes the reported information utilizing a Lotus 1-2-3 spreadsheet for data manipulation and processing. From this 1650-line data base requisite reports are derived and forwarded to cognizant personnel/activities. [Ref. 14]

3. Data Usage and Output

At all three of the primary Type Commanders, the flight hour program data collected from the reporting activities are manipulated into a variety of reports and usages and distributed to a plethora of concerned offices and commands. Some of the more widely-used examples are [Ref. 15 and 16]:

- Operational Report 32 (OP-32) - A budget document; separated into spending categories by Appropriation, Budget Activity, Activity Group, and Sub-Activity Group (e.g., the printout for "17-1804-II-B2-BG" deals with past expenditures and expected future obligations for TACAIR fuel).

- Operational Report 5 (OP-5) - Serves as an indicator of FHP status to the Major Claimant. Delineates increases/decreases in flight hours and corresponding dollars to various programs; costs of squadron transitions, standups, and standdowns; and projected FHP expenditures for POM inputs.

- Tracking Report - An informal, local report delineating FYTD obligations in cost pools affecting CPH computation: flight hours, fuel, maintenance and repair, and AVDLR. Covers all information listed on the formal FHCR (below) plus it includes comparison data between TYCOM calculations and NAVCOMPT guidance for acceptable CPH limits by TEC.

- Flight Hour Cost Report (FHCR) - The primary TYCOM FHP status report: their official and direct input to OPNAV/NAVCOMPT. (Covered in detail below).

Note: Colloquial terminology not withstanding, for the purposes of simplification, the term "Flight Hour Cost Report" refers to *both* the input received by the TYCOM from the shore facilities as well as the output generated by the TYCOM to NAVCOMPT. The convention at CNAL is to refer to the input received from shore stations as the "Estimated" FHCR, reserving the unmodified title only for the official output. At CNAP, FHCR refers only to inputs, whereas the generated output is known as the "T/M/S Report". For CNARF, FHCR covers it all. At OPNAV and NAVCOMPT, they label the monthly inputs they receive from the Type Commanders as Flight Hour Cost Reports and are unconcerned about minor lower-level administrative differences.

Of all of the many uses the FHCAS data base is put to, the "in-house" Tracking Reports (the actual terminology may vary among TYCOM's) is probably the most important to local Flying Hour Program management. Due to its simplified format, ready availability to any who desire the information, and comparative summary, the Tracking Report is utilized by a multitude of administrative offices at Force headquarters, as well as distributed, on a limited basis, to various concerned reporting sites as an aid in tracking obligations and remaining resources [Ref. 15]. A multi-formatted document, it contains separate segments with FYTD totals for each area of expense accumulation affecting Cost Per Flight Hour (CPH): Number of flight hours; Fuel CPH; Maintenance and Repair CPH (listed as "Other"); Depot Level Repair (DLR) CPH; Fiscal year total CPH's by cost pool; NAVCOMPT CPH standards for each cost pool; and the percentage difference between the Type Commander's and NAVCOMPT's CPH figures. If only for this last column, the ability to compare "actual" CPH to "budgeted" CPH and obtain an instant assessment of how the operational units stand in relation to the financial controllers (or the TYCOM's own obligation schedule) is invaluable to those charged with budget formulation or execution.

Each of the Type Commanders electronically submit monthly Flight Hour Cost Reports (FHCR's), via the Ships Parts Control Center (SPCC), Mechanicsburg, Pennsylvania, to NAVCOMPT. Additional information copies are forwarded to their Major Claimants (and, in the case of CNAP and CNAL, their respective Fleet Marine Force commanders). These FHCR's delineate fiscal year to date (FYTD) information on flight hours flown (from the squadron BOR's) as well as obligations for fuel, intermediate and organizational level maintenance costs, and depot level repairs (from the station FHCR's).

There are, of course, minor format, phraseology, and data inclusion differences among the Type Commanders, particularly between the Active Duty and Reserve forces. All FHCR's separates the data by branch of service (Navy or Marine Corps), aircraft T/M/S, and TEC. For each specific line item, they then provide the cumulative total flight hours flown, barrels of fuel consumed, and the computed Costs Per Flight Hour (CPH's) for each of the primary cost pools – Fuel, Maintenance and Repair, and Depot Level restoration -- as well as a total dollar obligation figure. The Active Duty components partition their reports by activity category (e.g., Navy TACAIR, Marine Corps Support, Navy Readiness [i.e., Training squadrons, FRS's], etc.), providing service and mission subtotals for each. The Reserves segment their report by squadron/unit/Marine Aircraft Group (MAG), with a separate section specifically depicting directed flight operations flown in support of drug interdiction. While CNAP includes the number of operational aircraft per TEC, and CNAL identifies the applicable Budget Activity, both list the applicable Program Element for budgetary purposes. CNARF also breaks down the AG's/SAG's, but includes information on expenditures for the various civilian maintenance contracts it manages. Unlike its

Active Duty counterparts who lump all Maintenance and Repair cost under one generic title ("Other"), the CNARF breaks it down into Organizational Level Maintenance Activity (OMA) and Intermediate Level Maintenance Activity (IMA) repair obligations. Despite the individuality of each FHCR, these reports essentially contain the basic obligation information and CPH computations for the respective Type Commander as input for NAVCOMPT budgeteers.

Although the reporting procedures, data collection and manipulation, and administrative chains of command differ, often dramatically, among the Type Commanders, the actual formulae utilized for calculating a Cost Per Flight Hour in each spending category are identical. Basically, there's nothing magic about it; it's merely [Ref. 16]:

$$\text{Cost Per Flight Hour} = \frac{\text{"How much you spent"}}{\text{"How much you flew"}}$$

The TYCOM's deal in real-time data, updated monthly by the reporting units; in accounting terminology, their figures can be thought of as "actual". From this basis, they compute the latest obligation totals for the four basic cost pools: Fuel, OMA, IMA, and AVDLR.

- Fuel - The cost of aviation fuel, engine oil, and lubricants.
- OMA - Organizational Maintenance Activity; the costs incurred at the squadron level to maintain the aircraft. OMA costs are entirely for consumables, or items that are more economical to replace than to repair.
- IMA - Intermediate Maintenance Activity; the cost associated with intermediate level repair and maintenance. These are AIMD cost and are related to both consumables and repairables, items for which repair is considered more economical than replacement.
- AVDLR - Aviation Depot Level Repair; the cost of major component rework, repair, and replacement beyond the Aircraft Intermediate Maintenance Department (AIMD) level of capability. The AOM portion of AVDLR consists only of repairables, managed solely by DONSF. For

most aircraft T/M/S. AVDLR represents the largest and most variable cost pool. [Ref. 13: p. 17; and Ref. 8: p. 40]

The total obligation for each T/M/S and TEC is simply the sum of each of the cost pool CPH's. While there *is* some adjustment for inflation utilizing the escalators provided by NAVCOMPT in their 7111 Notice, no other major externalities enter the equation at the operational level.

C. NAVY STAFF COST PER FLIGHT HOUR FORMULATION

As noted in Chapter II, the Navy Comptroller's office collects budgetary inputs, screens them for expenditure totals and executability, then forwards them up the financial management chain of command. It also serves as the collector, and disseminator, of executive level fiscal guidance to the Fleet. As far as the service is concerned, NAVCOMPT is both the originator and recipient of all money matters for the Navy. With regard to the Flying Hour Program, NAVCOMPT uses the same multi-step formula as OPNAV (see Chap. II, p. 11) in computing requested/allocated budget dollars. Both offices also utilize the same formulae for calculating the most variable component in that equation, that of Cost Per Flight Hour. The differences between NAVCOMPT and OPNAV lie, aesthetically, in the mandates and missions of those offices.

NAVCOMPT is purely a fiscal management organization tasked with financing the personnel, equipment, and operations of the Navy and Marine Corps, while eliminating waste and inefficiency wherever present. In an increasingly severe budgetary climate, the pressures to economize on this organization, both internal and external, are enormous. Accordingly, budget submitting activities find that without proper and extensive justification, requested funding items have very little chance of surviving the NAVCOMPT gauntlet.

Conversely, OPNAV, while firmly ensconced in the politically-oriented hierarchy of the Pentagon, is still "operator oriented". Serving as the flight hour program sponsor, they review funding requests with an eye towards mission readiness and ultimate contributions to the overall combat capability of the aviation forces. Performing the same fiscal gymnastics as NAVCOMPT, OPNAV screens budget submissions and financial reports from the Fleet for administrative errors, and weaknesses in logic/justification/executability that may be susceptible to marks by NAVCOMPT. While NAVCOMPT is generally approachable only at annual budget submission and Mid-Year Review, and then only through the Major Claimant, the Type Commanders have a near-continuous dialogue with OPNAV representatives on funding request anomalies or official policy decisions that will affect mission readiness through variations in financial support. It is for these reasons that this thesis concentrates on the Navy Staff office rather than the Navy Comptroller when addressing the upper level management of the flight hour program.

1. Flying Hour Cost Reporting System (Descendent)

The office of the Special Assistant for the Flying Hour Program (N889E) at OPNAV manages the aviation assets for the Chief of Naval Operations [Ref. 2: p. 15]. With access to the same FHCRS information transmitted to NAVCOMPT, N889E is able to serve as an interpreter and buffer between the operational funding necessities of the Fleet and the frugality-biased actions of NAVCOMPT. Depending on one's financial perspective, actions by the OPNAV staff can be seen as either draconian or benevolent [Ref. 9 and Ref. 17]. The important contrast, however, is that unlike the dictatorial precepts issued by NAVCOMPT and singular prerogative of reclama, there exists a limited option of *negotiation*

between the Fleet and N889E when it comes to divergent priorities. OPNAV also serves as the Fleet's continuous representative before NAVCOMPT when budget discrepancies arise. Once a questionable line item is decided by NAVCOMPT, N889E works with the Type Commanders to implement this budgetary perturbation in order to minimize any negative effect on combat readiness.

2. Data Collection, Manipulation, and the OP-20

OPNAV receives copies of the Flight Hour Cost Reports generated by the Type Commanders electronically through SPCC, Mechanic urg, just like NAVCOMPT. The staff also receives direct guidance from the Comptroller's office via NAVCOMPT NOTE 7111, as well as indirect guidance through constant communication with the Flying Hour Program Budget Analyst (formerly OP-821D2, now under N82) [Ref. 17]. Armed with this data base, N889E is able to compare Fleet fiscal performance and budget execution to official guidelines in order to highlight potential problem areas requiring closer local management or additional financial assistance. Probably the most significant contribution by N889E to an overall heightened fiscal awareness for all parties concerned is the compilation and publishing of *the* primary resource allocation document, the Operational Report 20 (OP-20).

The Flight Hour Projection System (FHPS) is utilized with the Planning, Programming, and Budgeting System (PPBS) to establish and justify FHP requirements in the Department of the Navy's budget. The most significant product of the FHPS is the Operational Report 20. [Ref. 18: Encl. (4), p. 1] The OP-20, in its various formats, is utilized by both the Fleet and NAVCOMPT as a budget formulation and execution monitoring tool. It provides local commanders with guidance concerning the annual number of flight hours that may be flown by

each T//M/S aircraft, the dollar amount to be budgeted for each flight hour by T/M/S, and the total dollar limit allowed for the fiscal year [Ref. 7: p. 54]. In essence, it depicts [Ref. 18: Encl. (4), p. 1]:

> ... Budgeted flight hours; a cost breakout [for] AFO (POL), AVDLR, and other AOM costs in term of a projected average Fleet-wide Cost Per Flight Hour (CPH); and, annual costs for each type/model/series aircraft assigned to specific program elements within budget activities....

As with it's antecedent's, the TYCOM's FHCR's, the OP-20's information is categorized by Budget Activity, Program Element, T/M/S and TEC. It lists Utilization Factors, total flight hours available, cost per hour goals by cost pool, annual expenditures in dollars by cost pools, and planned hourly fuel consumption rates.

The FHPS produces OP-20's for the current fiscal year (CY), budget year (BY), and the next four future years (out years) in concert with the Six Year Defense Plan (SYDP; a.k.a., the Future Years Defense Plan, FYDP). The annual budget cycle drives the FHPS promulgation dates and normally three major revisions of the OP-20 can be expected during a fiscal year [Ref. 18: Encl. (4), p. 1; Ref. 3: p. 20; and Ref. 7: p. 54]:

- June - Program Objective Memorandum (POM) out year controls. This gives the operational commanders opportunity to respond if they do not feel the planned requirements are a true reflection of their actual requirements. (Note: This is of particular importance to the Unified Commands, CINCPAC and CINCLANT, which are not in the fiscal chain of command.)

- September - NAVCOMPT Final; this is the final OSD funding schedule for the proposed Budget Year (BY).

- January - Congressional Final. The Op-20 is not considered stable until the Congressional Final version is published for the execution, or Current, year (CY).

Note: The "History Final" is an OP-20 exhibit containing information on each cost pool by aircraft Type/Model/Series, reflecting the entire N889E data

> base for all years. It is updated annually and continuously available to concerned parties electronically. It summarizes all the final year-end executions reported to OPNAV through the FHCRS and the service's cost accounting system. It provides each command an historical overview of its execution effectiveness. [Ref. 17]

In June, with the issuance of the POM OP-20 and armed with nine months of real-time Cost Per Flight Hour figures, local commanders can evaluate their recent budget submissions (made under the guidelines of the previous Congressional Final, and in light of unfunded requests and the results of the then just-completed Mid-Year Review), and address concerns about particular budgeted CPH computations and their consequences on mission accomplishment and readiness in the future. By September, Fleet units have a rough idea of the funding climate of the next fiscal year through the NAVCOMPT Final OP-20, and are able to adjust their operational plans accordingly. It is not until the issuance of the Congressional Final in January (four months into the fiscal year, halfway through the local budget formulation process, and one month before inputs are due for the NAVCOMPT Mid-Year Review), however, that unit commanders find out their *true* budgetary goals for CPH and TOA. From that point on, it's rampant scrambling by local financial and operational managers to attain the necessary obligation schedule for allocated resources prior to the end of the fiscal year.

The OP-20 document is supported by four schedules, each of which display the number of aircraft, crew seat ratios, aircrews, and "required" versus "budgeted" flight hours [Ref. 18: Encl. (4), p. 1; Ref. 6: p. 102; and Ref. 7: p. 54]:

- Schedule A - Tactical Air and Anti-Submarine Forces (TACAIR/ASW).
- Schedule B - Fleet Air Training (i.e., Fleet Readiness Squadrons [FRS's] and Adversary Squadrons).

- Schedule C - Fleet Air Support, strategic air forces, and environmental prediction units.
- Schedule D - Reserve forces (Navy and Marine Corps), Chief of Naval Education and Training forces (CNET; i.e , Training Command), Recruiting Command aircraft, and CINCUSNAVEUR aircraft.

Through budgetary line items by T/M/S and TEC, the breakdown of these schedules is sufficient to provide specific fiscal guidance to every single aviation unit within the Force.

3. Cost Per Flight Hour Determination

In developing a data base for flight hour costing, N889E has historical information dating back to 1982. This data, taken from the Flight Hour Cost Reports submitted by the Type Commanders and various accounting inputs, depicts the actual obligations incurred for each T/M/S and TEC, totaled as well as separated by cost pool. This data base is continually updated with each monthly TYCOM FHCR submission. [Ref. 17]

Unlike the annual budget equation used by N889E and NAVCOMPT (Chap. II, p. 11), the formula for computing the budgeted Cost Per Flight Hour is, in the vein of the Type Commanders, relatively simple. The OPNAV/NAVCOMPT budgeted CPH is, essentially, a three-year running average of "actual" figures submitted by the TYCOM's on their FHCR's. For example, to obtain the 1993 CPH figures released on the POM OP-20 in June, 1992, N889E took the 1989, 1990, and 1991 *actual* fiscal year expenditure totals by cost pool and the total flight hours flown from both the Navy's cost accounting system and the FHCRS, manipulated these figures to achieve a three-year average in *1992* dollars, then applied the applicable 7111 Notice escalators for inflation/deflation. (Note: For Maintenance [a.k.a., "Other"] costs, the inflator is actually a

percentage from two different sources: DoN Stock Fund [DONSF] at 60 percent; and Defense Logistics Agency [DLA] at 40 percent.) [Ref. 17]

The purpose of utilizing a three-year average is to provide a sufficient data base to overcome any temporary "hills and valleys" in cost pool expenses. When an event dramatically influences total FHP expenditures (e.g., Operation Desert Shield/Desert Storm), N889E will "normalize" that year's obligations by extracting the money that was added to the Fleet's accounts to offset incremental costs. Once the abnormal funding input is negated, N889E will carry out the three-year averaging process to compute a corrected CPH. This process is one of continuous monitoring at OPNAV, reacting to any expenditure outside of the POM. [Ref. 17]

D. FORMULAE COMPARISON AND VARIANCES

As the military services institute the Corporate Information Management (CIM) initiative, and transition to unit costing under the Defense Business Operating Fund (DBOF), information systems, data base management, analytical models, and the computing and communications infrastructure will necessarily evolve [Ref. 7: p. 96]. While Naval Aviation does have a large head start on many of its sister service components with its current Flight Hour Cost Reporting System, there are still many areas of conflicting data, computations, and priorities which should be addressed. One of the most frequent trouble spots is the goal of an accurate, justifiable, and universal Cost Per Flight Hour determination. The following section will discuss some of the current obstacles to that ideal.

1. Flight Hour Cost Variances

When using the term "variance" as applied to the Flying Hour Program, it means the difference between the planned and actual Cost Per Flight Hour

figures. The "planned" may refer to either the local unit's scheduled obligation rate for the fiscal year based on operational commitments/goals and available funding, or the budgeted CPH guidance issued by N889E in the OP-20 report. The "actual" figure, in accordance with standard accounting terminology, deals with the combined results of documented obligations by cost pool and represents known funding expenditures for that particular item.

These flight hour cost variances can be of a positive or negative nature, depending upon their dollar relationship with the base figure, and that "positive" does not always equate to "good". When a financial manager finds, through some singular or combination of events, that his unit's CPH is temporarily lower than planned, he has essentially "generated an asset" within his budget. This results in two fiscal conditions: 1) If the factors causing this anomaly persist, he must obligate these unexpected funds in another area prior to fiscal year end or risk losing them, possibly with a proportionate reduction in overall funding the next year; 2) If the cause of the unforeseen windfall is indeed short-lived, he must guard those funds, keeping them as a reserve when normal conditions again return, hoping that there will be sufficient time to react if they do not (see condition one). [Ref. 13: pp. 18-19] Conversely, a negative CPH variance is almost always seen as a "bad". Given the fact a squadron may not exceed its allotted Operating Target (OPTAR), when it costs a unit more to fly its aircraft than it is budgeted for, it must reduce the time that squadron aircrew actually fly. If the original budget submission is based on attainment of full mission readiness by all assigned aircrew, then, by definition, this goal is no longer attainable, regardless of the PMR percentage funding factor utilized by NAVCOMPT. Many units attempt to maintain their scheduled flight program by instituting various

economizing measures affecting flight parameters; these are usually marginally effective, and often come at the expense of flight realism and training effectiveness. The overall result of a negative CPH variance is a loss in either flight hour quantity or quality.

2. Causal Factors and Consequences

When comparing the Cost Per Flight Hour figures calculated by the Type Commanders to those derived by OPNAV, the fact that variances occur between identical Type Equipment Codes is not altogether unexpected. Each organization utilizes a different data base, formula, and set of priorities when computing these figures; it would be a remarkable coincidence if there *weren't* any differences. Despite these dissimilarities, since CPH funding effectively limits the achievement of full mission readiness, it is *essential* that the TYCOM's make every attempt to bring their costs per hour in line with OPNAV's, or convince N889E to modify its numbers.

In accomplishing this task, staffers at the Type Commanders aggressively monitor BOR/FHCR inputs in a continuous comparison with the latest OP-20 CPH guidance. Anomalies are immediately addressed with the responsible command to determine the motivating factor(s) and corrective options. [Ref. 15] If the Force Comptroller is able to reallocate funds to compensate for the variance, or if it is deemed a temporary or inconsequential event, the matter is handled at the sub-claimant level. However, if the TYCOM is unable to absorb the consequences of the noted divergance, a request for additional funding must be forwarded through the Major Claimant to NAVCOMPT (Note: Unless the negative effects of the CPH variance are time-critical, [e.g., a squadron is unable to accomplish the requisite practice landings for aircrew

currency to embark aboard an aircraft carrier prior to a deployment without exceeding their quarterly OPTAR limits], this request will become one of the many "unfunded" requirements hopefully submitted during the Mid-Year Review.) [Ref. 13: p. 19-20] Through the use of such media as the OP-5, OP-32, FHCR, and the basic telephone, and in the interest of combat readiness (if not self-preservation), the Type Commanders maintain an unflagging and uninterrupted communications flow with OPNAV and NAVCOMPT when it comes to flight hour cost variances.

In attempting to isolate Flying Hour Program idiosyncrasies at the unit level, the Type Commanders have encountered a myriad of factors affecting Cost Per Flight Hour computations. Some of the most prevalent and influential include:

a. Unit Location

The operating environment of a squadron can have a significant effect on flying expenses. For example, a tactical A-6E squadron stationed at NAS Oceana, Virginia, has different maintenance and AVDLR costs due to the range and proximity of available facilities when compared with a similar squadron based at NAS Whidbey Island, Washington. These diversities in expense categories continue when considering aircraft transit times to/from target areas or training routes, availability of unrestricted operating areas, civil restrictions on Field Carrier Landing Practice (FCLP), live ordnance training limitations, etc. [Ref. 1: p. 19]. The result is an often noticeable disparity in CPH figures among aircra . with the same T/M/S. This area is of particular concern to the Reserves, where aircraft units are often *not* co-located with comparable Fleet squadrons,

necessitating creation of a duplicate maintenance support base for a minimal amount of units. [Ref. 14]

b. Operational Tempo (OPTEMPO)

Despite the Congressional requirement for biennial budgets, actual funding for DoD programs is reviewed, debated, and approved on a yearly basis. Thus, while the Budget for the Flying Hour Program has a twelve-month life span, a majority of the Navy and Marine Corps' operational units are on an eighteen-month "turn-around" cycle. This continuous cycle of preparation, deployment, and recovery encompasses numerous phases, each of which has its own peculiar flight hour usage and intensity [Ref. 1: p. 27; and Ref. 3: p. 14]:

1. Month 1 : Personnel turnover and leave - 25 % PMR
2. Months 2 - 9 : Turn-around training - 78 % PMR
3. Months 10 - 12 : Pre-deployment training - 105 % PMR
4. Months 13 - 18 : Forward deployment period - 125 % PMR

Note: The above cycle applies only to Active Duty forces. For the Reserves, squadrons experience the same "build-up/slow-down" as they prepare for the two-week Annual Training exercise every year [Ref. 14].

This disparity between funding and operational cycles almost guarantees that, at any given moment, the budgeted cost per hour will either lead or lag a realistic hourly flying cost reflecting actual aircraft usage. During the early phases of "work-ups", this comparison to an historical average may prove to be an advantage for the Fleet units involved. Towards the latter stages, however, it can severely crimp the effectiveness and viability of the forward line of defense and our nation's power projection capability.

c. Type of Flying

Whereas the Training and Readiness Matrices provide guidance as to the *number* of flight hours each event requires, it does not specify the *intensity* of the evolution. For example, an Aircraft Combat Maneuvering (ACM) hop, a High-Altitude Airways Navigation flight, and a Night Carrier Qualification event may all be listed as "1.5 flight hours", but the fuel consumption rates, stress on the airframe and engine, and resultant maintenance costs are *vastly* different. The result is highly volatile fuel and maintenance costs depending upon the training event/cycle the squadron is engaged in at the time.

d. Non-PMA and Support Flights

A certain percentage of a squadron's flight hours will be spent in miscellaneous areas which do not directly translate into a measurable increase in aircrew readiness. These events may be a conscious choice by the unit (e.g., an "in-house" training program to build up aircrew proficiency with a new aircraft component or capability) or may be unavoidable (e.g., aircraft transit time to a target or detachment site). Additionally, once the currency requirement for a PMA item is obtained, no further readiness points may be derived from repeating that event within the qualification period (i.e., one can't be more than 100 % qualified in any one event) [Ref. 5: p. 3]. Regardless, a unit may be *directed* to duplicate a particular mission to the detriment of training in less qualified areas (e.g., when the Air Wing directs the A-6's to provide continuous refueling tanker support for F/A-18's, even at the expense of canceling bonafide training missions and re-configuring bombers to act as tankers). This "Non-PMA" area also includes "Staff" flights, hours flown by non-squadron personnel who must attain an annual minimum of flight time to retain their aviator qualifications. The

offshoot of these many facets, since they are normally not funded separately by NAVCOMPT, is that the units involved must trade productive mission readiness training hours for these support hours. A resultant loss in combat capability is then inevitable.

e. Aircraft Maintenance Costs and Human Error

A major component of the Cost Per Flight Hour equation is the cost of aircraft maintenance and repair. The primary input for this data is repair costing figures taken from the Maintenance Data Collection System (MDCS) and submitted to the TYCOM's via the BOR's/FHCR's, and to NAVCOMPT via the Aviation Supply Office, Philadelphia, Pennsylvania. Input of the raw data, the actual typing in of endless mounds of supply requisitions, component repair forms, shipping and storage documents, etc., still remains in the hands of designated squadron or station personnel, usually junior in rank and experience. Even a cursory scanning of the BOR and FHCR Correction Reports received by the Type Commanders would reveal the traditional maintenance and repair cost documentation system is aged, cumbersome, and overburdened. Typing errors, incorrect data entries (particularly if the TEC is wrong), and late entries all serve to invalidate the precision of OMA and IMA costing data. [Ref. 15]

Two initiatives currently under investigation/trial to address the problems of incorrect data entries or manipulation are: 1) The Personal Computer Message Transmission (PCMT) concept; and 2) The Aviation Storekeeper Information Kit (ASKIT). PCMT is a proposal currently under development at COMNAVAIRPAC in which squadron BOR's and station FHCR'S would be submitted to the Type Commander on floppy disk each month rather than via massage traffic. This would significantly expedite FHCAS data entry

within the Comptroller's office, as well as eliminate another possible data transcription error source. ASKIT, basically, is a spreadsheet for use by the squadron's supply-management personnel (i.e., Aviation Storekeepers, "AK's"), which organizes and automates the unit's OPTAR Log. This initiative would allow FHP managers a continuous running total of squadron financial obligations in real-time figures, allowing for more intelligent management (and reporting) of remaining resources as well as near-foolproof avoidance of a 1517 overexpenditure violation. [Ref. 15]

While AVDLR expenses are more closely scrutinized for accuracy by submitting activities, they are proving to be the most unpredictable of all of the applicable cost pools [Ref. 14]. If an Intermediate level repair facility determines that a particular component or aircraft is Beyond the Capability of (their) Maintenance (BCM), they forward it to the applicable Naval Aviation Depot (NADEP). Depending on where this facility is located, the squadron initiating the maintenance action is now faced with unexpected shipping and handling costs, delays due to transit and repair time, the institution of the component carcass tracking system to ensure return or credit, etc.; all this added to the exploratory repair costs charged by the local AIMD prior to a BCM decision. [Ref. 19] Although squadrons have aircraft and engine NADEP induction dates planned years in advance, an unplanned referral of a component for AVDLR can happen at any time, with dramatic and volatile effects on cost per hour computation.

E. SUMMARY

This chapter has examined the differences in roles and responsibilities between the Type Commanders and the Navy Staff (OPNAV) in their collection, computation, and usage of Cost Per Flight Hour (CPH)

information. This was followed by a comparison and analysis of CPH variances, their causes, and their consequences. The next chapter will address some additional problems associated with the Flying Hour Program, as noted in the secondary research questions listed in Chapter I.

IV. FLYING HOUR PROGRAM ASSOCIATED PROBLEMS

While attempting to determine an accurate and universally applicable Cost Per Flight Hour is a significant, and perpetually troublesome, factor in the Navy's Flying Hour Program, it is certainly not the only concern faced by FHP managers. In discussions with representatives from the three primary Type Commanders, some additional topics came to light as current, or expected future, problems. These areas include (see Chapter I, p. 2):

- In the past, a steady procurement of new aircraft injected a "vitality" or "freshness" into the data base via the inclusion of unabused airframes with full, useful structural "life". With the slowdown, or in some cases, cessation of buys, this repetitive rejuvenation of the force is absent. Historical flight hour costs would not indicate the resultant intensified aging process, providing a misleading and overly optimistic expense figure.
- In a search for more efficient utilization of available resources, requisite expenditures for aircraft maintenance and repair components must be quantified more accurately.
- In light of the scarcity of funding for mission-essential flight hours, the justification of purely administrative travel, funded from the same apportionment, becomes increasingly difficult.

These issues will be addressed specifically in this chapter, in the order listed.

A. REVITALIZATION OF THE AIR FORCE

The operating environment of the Navy and Marine Corps is unusually harsh on both men and equipment when compared with their sister services. The unpredictable stability, climatic extremes, moisture and salinity of the sea take a tremendous toll on the useful lives of operators and machines, often far in advance of even the most pessimistic contractor predictions. With respect to the individual warfare communities within the Navy itself, Naval Aviation again loses

in the battle for equipment longevity. In the Surface Navy, major combatants are constructed with a thirty-year service life, given a regimen of continual upkeep and periodic shipyard visits. However, unless there are major weapons system or engineering modifications added later, that significant investment (i.e., purchase price) is secure for three decades; the majority of funding associated with that platform from then on is in logistical support and personnel. For the Submarine community, that same logic is true, to an even greater degree. Once the initial investment is made, the next thirty years are simply maintenance and operational expenses. With Naval Air, while the initial purchase price per unit is markedly smaller, so is the useful life. The comparative fragility of the airframes, the inherent hazards of the aviation environment (especially those associated with aircraft carriers), and the rapid technological advances and resulting obsolescence combine to reduce the service life of most naval aircraft to an average of 10-12 years. [Ref. 20] This fact alone dictates a more rapid turnover of inventory in Naval Aviation than in any other competitive or supportive service branch.

1. Aircraft Procurement Possibilities

The requirement for a combat ready air force at a moment's notice dictates the need for a comprehensive and well-supported series of follow-on weapons systems designed to meet the needs of a Navy-in-transition facing an as-yet-unevolved threat. As presently-deployed airframes age through use and time, aviation community sponsors must prepare for their extinction years in advance through a meticulously regulated weapons systems acquisition program. Taking into account the complexity and cost of the requisite levels of technology and sophistication of today's modern tactical aircraft, a lead time of eight to

twelve years (from programming proposal to first deployment) is not unusual for a generational improvement in combat capabilities [Ref. 20]. Throughout this extensive time period, a steady and predictable effort, both by the funding agency and the contractor, is absolutely vital in order to maintain the most economic production schedule. Interruptions in funding, or project development, can easily cause program-threatening cost overruns, perhaps leading to loss of congressional support. This has been the pattern for Naval Aviation as of late.

> Defense budget cuts have caused the number of naval aviation research-and-development programs to drop from 60 to 10 in the last two years. Not only have big programs like the A-12, P-7, and ATS been canceled, but the smaller programs have disappeared as well. [Ref. 21: p. 95]

Driven by fiscal and technological constraints, since 1985, in just the fixed-wing communities alone, aviators have witnessed the closing down of production, or cancellation, of the [Ref. 20; Ref. 21: p. 94; and Ref. 22]:

- A-6F and A-6G Intruder : Next-generation improvements to the A-6E; programs were canceled in favor of protecting the development and funding support of the A-12. All A-6 production was halted in late 1991 (see historical comments below).
- A-12 Avenger II : All-weather, long-range Stealth bomber, designed to replace the A-6. Although a joint effort with the Air Force, and despite the fact the aircraft was already in the Engineering and Manufacturing Development stage, the program was canceled in January, 1991, by Secretary of Defense Cheney due to cost overruns.
- P-7 : Land-based, long-range Anti-Submarine Warfare (ASW)/Maritime Patrol aircraft designed to replace the P-3 Orion.
- ATS : Advanced Tactical Support aircraft; planned to replace the combined capabilities of the E-2 Hawkeye Early Airborne Warning aircraft, the S-3 Viking carrier-based ASW aircraft, and the EA-6B Prowler Electronic Warfare aircraft (all of which will reach the end of their service lives before 2010).
- F-14D Super Tomcat : Generational improvement on the F-14A/A+ currently deployed as the carrier's long-range interceptor. The entire F-14

production line was shut down in mid 1992. (Note: This followed the cancellation of the AAAM [Advanced Air-to-Air Missile], the replacement for the Phoenix missile, the F-14's primary over-the-horizon weapon.) The F-14D is still supported by some members of Congress, but is strongly opposed by Secretary Cheney.

- V-22 Osprey : Advanced concept, rotary-wing design; a multi-role platform for a variety of missions, viewed as a replacement for numerous fixed and rotary-wing aircraft. Repeatedly canceled and most adamantly opposed by Secretary Cheney, yet just as often added back into the defense appropriations bill by Congressional supporters.

As of the Fiscal Year 1994 Budget submission, Naval Aviation was left with three remaining priorities for new aircraft procurement [Ref. 21: p. 94]:

1. AX : A replacement for the A-6 Intruder; more expensive and less-capable than the A-12, yet not scheduled for introduction to the Fleet until 2005 (at the earliest), almost ten years after the Avenger II would have flown.

2. F/A 18E/F Hornet : A generational follow-on to the F/A-18C/D models currently deployed; a multi-role aircraft (fighter and ground attack) experiencing rapidly increasing program cost. In Full-Scale Development now, the first prototype is not scheduled to fly until 1995, just when the current Strike-Fighter force approaches the end of its service life. While there are many detractors touting poor range and fuel specifications, the Hornet has tremendous support in Congress with subcontractors in 49 different states.

3. ASTOVL : Advanced Short Takeoff and Vertical Landing aircraft; designed to replace the Marine Corps' AV-8B Harrier II between 2005 and 2010.

2. Current Resource Management

While the Fleet, in desperate need of modernization throughout several critical communities, waits for relief in the form of new aircraft, program sponsors have turned to enforced resourcefulness and innovation. In light of the diminishing aviation budget, many aircraft community managers have taken steps to increase their platform's service life to 15, even 20 years. Training syllabi are reviewed with an eye towards resource conservation and airframe stress reduction. Techniques such as reducing bomb loads to cut down on wing

fatigue, limiting high "g" maneuvers within specific criteria, elimination of non-essential flight to preserve airframe hours, etc., in concert with a heightened awareness of, and attention to, on-board airframe stress-monitoring equipment have all proven effective in stretching the useful lives of these now irreplaceable assets. These steps, however, often come as a trade-off with training readiness or mission effectiveness. The A-6 Intruder, for example, had an Initial Operational Capability (IOC) of March, 1963, when it deployed for the first time. Due to the cancellation of its two follow-on aircraft (the A-6F/G and A-12), a massive program of Depot restoration, combined with rewinging of the entire active force, has been undertaken. These measures reflected the desires and hopes of the Navy hierarchy of extending the A-6's wing and airframe life as it enters its third decade of service until a replacement (currently designated the AX) enters the Fleet. [Ref. 21: p. 92].

This venerable warrior, the only long-range, all-weather strike platform in the Carrier Air Wing (CVW) inventory even today (therefore the only real justification for the massive expense of an aircraft carrier as a power projection tool), is currently scheduled to be active as a front-line combatant until the year 2015. To attain this near-mythical goal of a 52-year service life for a carrier-based aircraft, operational maneuvering and usage restrictions have also been implemented by the community degrading both the quality and quantity of training events. While some may argue the "g" and flight hour limitations are simply an exercise in judicious resource management, aircrews only know they are forced to train utilizing minimal weapons loads and the "least stressful" (to the aircraft) maneuvers, significantly taking away from event realism and aircrew concentration on the task at hand.

Despite even the most aggressive asset conservation programs, the assigned missions and operational schedules of Active and Reserve squadrons require periods of outright abuse of airframes and wings, markedly diminishing structural integrity and longevity (e.g., carrier takeoffs and landings, ACM, dive-bombing, salt-water intrusion and corrosion, etc.). While many of these events are planned and can be compensated for ("averaged out") through careful aircraft scheduling, there remains the ever-present specter of Operational Tasking. During Operations Desert Shield and Desert Storm, naval and Marine aircraft experienced increases of up to 300 percent *over and above* the already accelerated PMR of deployed sortie rates [Ref. 9]. Not only were the flight hours multiplied, but the *type* of flying was of the most demanding and strenuous nature – that of actual combat. Affected units endured exponential service life expiration on aircraft, willingly trading future asset use for aircrew safety and mission success through "limit-of-the-envelope" maneuvering and tactics.

3. Unplanned Asset Over-Utilization

Type Commander program managers carefully monitor Fleet inputs (through BOR's/FHCR's, as well as combat and maintenance readiness reports) for trends indicating potential Type/Model/Series availability deficiencies within their rapidly-aging air force. One of the outcomes of the unplanned overuse of assets during the war in Southwest Asia has been a startling drop in flight hour execution rates in certain squadrons. The accelerated flying time requirement and the character of the flights, combined with a harsh operating environment and coupled with strained logistical support severely degraded scheduled and preventative maintenance while overseas. Upon return to the United States, this necessary mechanical neglect "caught up" with the units. Squadrons found

themselves unable to achieve even minimal flight hour goals due to the fact they didn't have enough "up" aircraft to meet the flight schedule. Readiness plummeted as PMA qualifications expired and aircrew were unable to get airborne to requalify. Additionally, OMA, IMA, and AVDLR cost were astronomical as the squadron's "Awaiting Maintenance" and "Awaiting Parts" lists grew hourly. Correspondingly, unit Costs Per Flight Hour reached record highs as the few flight hours achieved bore the brunt of carrying the excessive maintenance and repair expenses. (Note: Not all squadrons participating in the war with Iraq had devastating reductions in combat readiness. This trend, noted through much of latter FY 1991 and FY 1992, was more pronounced in shore-based units, and concentrated in rotary-wing squadrons in particular; Marine Corps helicopters experienced the greatest difficulties.) [Ref. 9]

4. Lessons Yet To Be Learned

Incredulously, from the viewpoint of the Type Commanders, there has been no apparent tendency to react, at the OPNAV level, through modified flight hour costs or procurement program definition to the "pay me now or pay me later" nature of aircraft maintenance in light of this "lesson learned" [Ref. 9]. The present accelerated sortie rates experienced by aircraft participating in Operation Southern Watch over Iraq are expected to produce the same results (less aircraft availability, higher maintenance costs, and lower mission readiness) as did Operation Desert Shield/Storm [Ref. 23]. Even if aircraft remain reasonably flyable upon return from the deployment, the remaining flight hours on the airframe and wings will be significantly reduced. The rapidly deteriorating service life of the naval air forces has caused a minor distortion in flight hour costing which will only exacerbate with time. While accelerated depreciation of assets is

an oft-encountered problem in general resource management, it becomes a disaster in Naval Aviation when only *three* of the current Fleet aircraft have replacements even identified, much less available.

B. AIRCRAFT MAINTENANCE EXPENDITURES

Each of the four cost pools for Cost Per Flight Hour calculation (Fuel, OMA, IMA, and AVDLR) has its own modicum of stability. Due to the volume of service contracts, the Navy is able to keep regional pricing of aviation fuel and petroleum products within a fairly narrow margin, and the international oil market has sustained only minor price fluctuations over the last several years. The last three maintenance-related costs, however, tend to vacillate unpredictably over a wide scale when viewed in an historical context. Each of these components is driven by different cost initiators of varying duration and significance, yet combine to effect the derived aircraft CPH on an occasionally-erratic monthly basis. The negative impact to the Flying Hour Program occurs because these temporary variations must still be funded; one can't stop flying just because the current CPH has exceeded some preconceived "cap". While OPNAV utilizes a three-year average of historical flight hour costs to specifically negate these transients, the Type Commanders must still absorb sporadically excessive expenses within a budget cleansed of a financial "cushion".

1. Cost Drivers

Organizational maintenance (OMA) is concerned with the daily aircraft repair activities at the squadron or independent aviation unit level. It consists of: Scheduled aircraft maintenance (repairs based on specific time or hourly limitations, e.g., the 28-day inspection for corrosion, the 500-flight-hour engine wear inspection); Unscheduled aircraft maintenance (repairs of aircraft

malfunctions/discrepancies noted during Scheduled inspections or as a result of aircrew post-flight "gripes"); Supply support (the stocking, collection, distribution, and requisitioning of consumable and repairable aircraft components, as well as miscellaneous administrative supplies); and Documentation (all departmental and aircraft records, as well as input to/utilization of the Maintenance Data Collection System) [Ref. 24]. Unscheduled maintenance is, by definition, unpredictable in nature; costs for this segment are derived from T/M/S historical averages when constructing budgetary inputs.

As mentioned previously, however, the combination of overly harsh usage (e.g., Desert Storm) and assets facing the end of useful service life are producing increasing variances from allocated funding levels in this area [Ref. 9]. Scheduled maintenance, while more formally delineated, is also affected by the same declining vitality of the air force as its complementary element. Due to unforeseen levels of stress, compounded by old age, operational units are experiencing equipment failures of degrees and types never before seen within that community. Aircraft components with histories of reliability and strength are simply "falling apart" with sometimes disastrous results.

This phenomenon is not just limited to electronic equipment; the Fleet is seeing catastrophic failures in basic structural frames and generic mechanical parts due to metal fatigue and stress fractures. [Ref. 23] Not only of these failures drive up the costs of Unscheduled maintenance (especially for the repair of large, inaccessible, or previously indefatigable components which were not considered at risk of failure during the designed lifetime of the aircraft and were therefore never properly reinforced within the Navy's supply system), but once identified, necessitate a series of mandated additional periodic inspections and/or

repairs requiring extensive man-hours and severely limiting aircraft availability and freedom of use.

Examples of this disturbing trend include structural delamination problems showing up on F-14 Tomcats, replacement and repetitive 10 hour inspection of the protective boot covering the rotor drive shaft on all H-1 Huey helicopters, and the three separate inspections and modifications which monitor and strengthen the wing butts and main gear landing trunnions of the A-6 Intruders (not to mention the rewinging of the entire aircraft fleet). [Ref. 14; Ref. 23; and Ref. 24] The supply and documentation support necessary to carry out this additional maintenance also increases proportionately. While the Type Commanders *have* occasionally been able to obtain full or partial coverage of the additional costs of these items through supplemental funding from their respective Major Claimant or NAVCOMPT, this has occurred on a hard-fought, case-by-case basis and is *not* an automatic feature of the FHP budgeting system.

The variance within Intermediate maintenance level (IMA) expenditures is heavily dependent upon their local operating environment and the Aviation Supply System (ASO). An Aircraft Intermediate Maintenance Department (AIMD) is, as its title would indicate, simply one department on a Naval Air Station. While its mission and scope of services provided is dictated by the number and Type/Model/Series of aircraft supported from tenant commands, the extent and overall capability of these services is limited by the allocated funding level from the station's Operating Budget (OB). AIMD's must compete with other air station departments with their budgets; they are not always able to purchase or upgrade their test equipment and repair facilities to optimum standards. When a squadron turns in a part for repair to the Aviation Maintenance Screening Unit (AMSU,

AIMD's Production Control work center), technicians check stock inventory to see if a replacement part ("shelf spare") can be issued. If none are available, the part is then designated an "Expeditious Repair" (EXREP) item and inducted for rapid handling and return. When the cognizant test "bench" is inoperable or non-existent due to malfunctions or funding restrictions, however, AIMD technicians have no choice but to mark the item as "Beyond the Capability of (local) Maintenance" and forward it to a cognizant Naval Aviation Depot or better-equipped IMA facility (Note: Items are considered BCM if the maintenance activity cannot repair the item because of lack of tools, equipment, parts or technical expertise. ASO *does* use a predictive formula to forecast expected demand rates and component repair times due to BCM action. However, this applies only to Aviation Consolidated Allowance List [AVCAL] planning and does not feed directly into CPH calculation or the FHCRS. [Ref. 25]) The resultant delays and additional costs for shipping and repair significantly appreciate IMA expenditures over planned figures. [Ref. 19]

While this phenomenon is damaging enough for Active Duty units, the effect is apparently magnified for Reserve squadrons. Yielding to constant pressure from congressional advocates to establish a military presence and help boost the local economy, RESFORONS are rarely co-located with their Fleet counterparts. This means local tenant support activities (i.e., base Supply, field services, Ground Support Equipment [GSE], AIMD, etc.) are overburdened by having to provide a variety of services to a wide-range, but relatively small number, of aircraft types. While the support activities genuinely strive for excellence, fiscal realities generally dictate the quantity and quality of services provided to small, dissimilar units suffer in relation to established commands.

The Reserves often fall victim to these cases of unfamiliarity, strained logistic lines, and poor economies of scale. This results in lower readiness and higher maintenance costs due to insufficient aircraft services and GSE, limited parts supply, and excessive AIMD BCM rates. One example of this is NAS New Orleans where one AIMD supports one squadron each of C-130 Hercules, P-3 Orions, and F/A-18 Hornets. Another is the marked maintenance CPH differences between the West coast Tomcats based at NAS Miramar, the hub of Pacific Fleet F-14 operations and support, and those of the East coast fighter squadron located at NAS Dallas. [Ref. 14]

As noted previously, Aviation Depot Level Repair (AVDLR) obligations are the most volatile of the three maintenance-related expense categories, primarily from unexpected BCM actions at the Intermediate level. Depot repair documentation is particular intricate as it involves the tracking of not only the physical component ("carcass") but of the expense category and responsible party. For example, if a squadron has a discrepancy with a vital component which limits the full capabilities of the aircraft but does not keep it from flying (i.e., places it in a "Partial Mission Capable, Supply" [PMCS] status), the maintenance managers may chose to simply requisition a new part and continue to operate the plane in other mission areas until a replacement part can be obtained through Supply. If there are no substitute parts immediately available and the squadron needs to regain this particular capability, the component must be removed (placing the aircraft then in a "Non-Mission Capable, Supply" status [NMCS]) and inducted into AIMD for Expeditious Repair. If then BCM'd by the IMA technicians, the part is shipped off for higher level maintenance.

The squadron originating the initial requisition is responsible for all maintenance and shipping expenses until that requisition is satisfied. Once an item is BCM'd, however, it is routed through the Aviation Supply Office to see if any other component is available within the stock supply that can be immediately issued rather than waiting for the return of the originally inducted part. This is where AVDLR carcass-tracking can cause tremendous expenditure errors. If the unit originating the requisition is not credited with a component "turn-in", it is charged the full replacement cost of the item (as in original issue) in addition to any repair costs accumulated to date. While responsible activities make every effort to eliminate this possibility, due to the time lag involved, these mistakes usually occur long after the squadron has received its replacement part and requires continuous, long-term vigilance by all parties involved with the process. [Ref. 19; and Ref. 26]

Again, the Reserves have compounded difficulties in this area. In addition to high BCM rates, there is also a separate repairable pipeline for reserve-owned components within the supply system. If the requisitioning squadron is located at a Reserve Naval Air Station of Naval Air Facility, component progress and financial responsibility is monitored by the CNARF carcass-tracking system. If a tenant activity of a Regular Naval Air Station, the carcass is then inducted into the CNAP/CNAL supply system, which is not covered by the CNARF data base. The possibility of turn-in documentation and cost-assignment mistakes increases markedly from that point. [Ref. 13: p. 29-30] Additionally, AVDLR expenses are increased when a squadron moves to a new aircraft or capability. The recent transitions of RESFORON's to Fleet-comparable platforms under the Horizontal Integration concept (A-7E to A-6E, F-

4S to F-14A, A-7E to F/A-18A/C, P-3A/B to P-3C, SH-2F to SH-2G), as well as the establishment of new units (C-130, HH-60, C-20, S-3), have both contributed to temporary spikes in maintenance and repair expenses.

2. Cost Versus Flight Hours

In dealing with the costs responsible for flight hour costing, the two major Sub-Activity Groups are Aircraft Flight Operations (AFO) and Aircraft Operations Maintenance (AOM) (see Chapter III, p. 30, for explanation). In an effort to achieve some better method of predicting Cost Per Flight Hour, various attempts have been made at correlating these two costs to the number of flight hours flown by the unit. Aviation fuel, oil, and lubricants contribute to a majority of AFO expenditures. These costs may be related directly to flight/engine hours and the relationship easily drawn and supported. AOM, expenditures, however, are primarily aircraft maintenance related. As explained above, there are too many unstable determinants to tie these costs simply to an hourly total.

> While AFO CPH are not always accurate because of poor tracking of execution, AOM CPH are not accurate because of the incorrect assumption that there is an exact correlation between costs and flight hours... too many variables other than flight hours affect AOM costs. These include environment, age of aircraft, and training of maintenance personnel, just to name a few. Also, many AOM costs are fixed costs and would not be eliminated with a reduction in flight hours. AOM costs per hour are even more inaccurate when broken down by TMS of aircraft as required by budget formulation. [Ref. 8: p. 48]

3. Information Quality Problems

Further clouding the issue of CPH determination is the possibility that the true costs of many of these modifying variables are not reported accurately. With the highly unstable nature of maintenance and repair costs, this compounds the errors associated with an already vague factor.

> ... The key element in developing the AOM element of the FHP budget is the historical AOM CPH reported by activities in FHCR's and BOR's. The primary purpose of the FHCR and accounting system structure, as relates to AOM, is to accurately collect cost and relate it specifically to the Budget Activity, Program Element, and TMS aircraft for which it was budgeted. Therefore, in order to attain a funding level for each TMS aircraft which is commensurate with actual AOM cost, it is critical that costs be correctly identified to the Type Equipment Code (TEC) of the TMS aircraft of the final consumer (the reporting custodian) [i.e., the Type Commander]. [Ref. 18: Encl. (5), p. 1]

As described in Chapter III, the aspect of human error in the proper documentation of aircraft maintenance and repair costs comes in many forms with just as many degrees of severity in its consequences. From the aircrewman who forgets to turn in a fuel receipt upon his return from a cross-country flight, to the work center supervisor who decides not to cancel an outstanding requisition filled by open purchase in order to build up a supply of "shop spares", to the pilot who "pads" his flight time in order to make his annual minimums, to the Maintenance Control clerk who uses the same TEC on all pre-filled Maintenance Action Forms (MAF's) because he doesn't have time to look up the proper code; all of these contribute to erroneous input into the FHCRS, artificially inflating or deflating the resultant flight hour cost figure for their unit.

Despite explicit guidance from, and aggressive monitoring by, the Type Commander comptroller/finance office staff, as well as sincere efforts at the squadron/station level to ensure accurate documentation, the bottom line is that humans occasionally make mistakes, it's unavoidable. [Ref. 14; Ref. 15; and Ref. 23] In an effort to lessen the number of these errors, as well as their impact, three Naval Air Systems Command (NAVAIRSYSCOM) initiatives are being implemented: a) the Training and Readiness Matrix (TRIX) system; b) the Computer-Aided NAVFLIRS Data Entry (CANDE) system; and c) the Naval Aviation Logistics Command Maintenance Information System (NALCOMIS).

a. TRIX

The Training and Readiness Matrix (TRIX) system is a computer program developed by the Naval Sea Logistics Center (NAVSEALOGCEN, or NLSC) to automate the mission readiness evaluation procedures using the criteria set forth in the joint CNAP and CNAL Squadron Training and Readiness Matrices instruction (CNAPINST 3500.67B/CNALINST 3500.63B). Unlike the current application utilized by Fleet operational squadrons for organizing training point accumulation ("Liberty Elite"), TRIX is an inter-active program encompassing not only the training matrices for each aircraft T/M/S but with access to the squadron's automated flight hour tracking data base (CANDE) to ensure accuracy and completeness. Not only an improvement in combat readiness documentation for the Fleet, TRIX also has future funding implications.

> TRIX was developed partly in response to the charge that the Navy Flying Hour Program had no link between operational effectiveness and resources expended... The TRIX system is an attempt to bridge that gap and give a reasonable indication of readiness levels attained as a result of FHP money spent. [Ref. 2: p. 37]

Upon full implementation, TRIX is designed to bring the following capabilities or improvements to the Fleet [Ref. 2: p. 38]:

- Provide "on line" entry level readiness capability.
- Upload flight training event codes extracted from Naval Aircraft Flight Record Data (NAVFLIRS, OPNAV form 3710/4; a.k.a., the "Yellow Sheet" to users).
- Allow "on line" data entry of ground training codes.
- Compute qualification points and currency expiration dates for all assigned aircrews.
- Compute squadron readiness for each assigned Primary Mission Area (PMA).

- Provide "on line" status of aircrew and/or squadron readiness.
- Provide local reports.

Note: Initiated in September, 1990, as a response to an OP-05 tasking, TRIX began "alpha" testing in mid-1992 in selected aviation units on both coasts. CNAL testing began in June, CNAP testing in September; CNARF will not become involved until after program approval. In CNAP, the program was given to one Carrier Air Wing [CVW-9], one H-46, one H-53, and one C-2 squadron. Units have direct contact with software development engineers at NLSC for immediate feedback should any problems arise. Data collection is expected to continue until December whereupon the programmers will make their final corrections and prepare it for release to the Fleet. [Ref. 9]

TRIX is a tool for the squadron Operations Department, it presents a user-friendly interface for PMA achievement documentation and reporting to concerned personnel/activities. As with the current Liberty Elite system, aircrew returning from a flight log the training accomplished on mission debriefing sheets for later data input (or, depending on the individual policy of the unit, with the simple format and ease of use of TRIX, input the data themselves). Once the data base is updated, TRIX will provide completed (and properly formatted) training and readiness reports as well as individual aircrew printouts appraising them of their personal qualifications. TRIX data can also be manipulated for direct and automatic input to periodic SORTS messages to JCS for combat readiness status reporting. [Ref. 9] Overall, TRIX provides FHP operators, managers, and controllers with a expeditious and accurate indicator of unit mission readiness based on flight hours flown, a major leap in funding justification.

b. CANDE

The Computer-Aided NAVFLIRS Data Entry (CANDE) system, also a NLSC response to an OPNAV tasking, is a computer program allowing the direct

entry of Naval Aircraft Flight Record Data (NAVFLIRS)-type information into an automated data base. This data base would then be accessible to the CNO's Flying Hour Projection System (FHPS), the Aviation Maintenance and Material Management System (3M), the Training and Readiness Matrix (TRIX) system, the Flight Hour Cost Reporting System (FHCRS), and the Maintenance Data Collection System (MDCS). The previous form-intensive NAVFLIRS system was a cumbersome, manual process of complex data entry, highly susceptible to errors, and with a lack of readily available data for internal squadron use. CANDE was developed to correct those deficiencies. Goals for the program include [Ref. 2: p. 36]:

- Provide accurate data for "up-line" processing.
- Give 100 percent validation at point of data entry.
- Facilitate completion of "Yellow Sheet" (NAVFLIRS) information.
- Reduce Operation/Maintenance Department processing time.
- Provide an OPNAV 3710/4 (NAVFLIRS) facsimile.
- Have local report generation capability.

To varying degrees, CANDE has been instituted Navy-wide since mid-1991. Previously, aircrew returning from a flight would fill out a "Yellow Sheet" in Maintenance Control listing their flight time, mission codes, ordnance expended, intermediate stops, and aircraft identification information. These forms would then be routed to a number of individuals in both the Operations and Maintenance Departments, each concerned with one or two particular sections of the NAVFLIRS data. The forms were then filed for reference purposes, eventually to be forwarded to a repository for permanent storage. This was a tedious, man-hour intensive process, totally dependent upon the complete and

correct routing of flimsy, easily-misplaced forms. With CANDE, flight information is input directly into a computer by the aircrew, or designated personnel, through a user-friendly interface using edit checks. This electronic data base is instantly available to all users on the net, simultaneously updating aircraft records, aircrew flight times and mission accomplishments, and squadron flight hour totals for CPH computation purposes.

Initial dissemination of CANDE throughout the Fleet *did* meet with some resistance on the part of users, due mainly to an internal management problem, because few had confidence the system could work or they felt they didn't have enough hardware to support it. Once implemented, however, user feedback has been extremely positive reporting dramatic savings in time, effort, and expenses while showing a marked improvement in flight hour accounting and reporting accuracy (error rates dropped almost immediately to below one percent). [Ref. 9] CANDE itself is a simple floppy-disk program which can be loaded onto any current Disk Operating System (DOS) computer and easily networked within the unit. Further dissemination of the squadron's information is currently performed by transference of a physical disk, tape drive or by modem; an integrated data base is planned for the future.

The degree to which CANDE has been *incorporated* within the aviation maintenance departments of Fleet squadrons is not at question; the level to which it has been *accepted*, however, is. CANDE does, indeed, provide measurable cost savings through the reduction of duplicitous data-entry personnel at the squadron and station level, the possible elimination of the use of OPNAV 3710/4 forms (the cost of which recently rose from $ 0.75 to $ 1.25 per three-part copy), and the more productive use of unit personnel in data collection,

manipulation, and reporting [Ref. 24]. While some squadrons have replaced the NAVFLIRS with a flight summary form for aircrew inputs and later data transcription into the program, a few (less than five percent) allow direct aircrew access into the data base to expedite data collection. Active monitoring of the program by its sponsor, NAVAIRSYSCOM, has indicated a desire for "immediate weaning" from the NAVFLIRS form. [Ref. 9] However, mid-level program managers (i.e., Maintenance/Material Control Officers), particularly those with extensive experience, are reluctant to divest themselves of a manual back-up for this critical information. They have seen automation/high technology programs instituted in the past (e.g., MIARS tapes) and suffered due to over reliance upon their effectiveness or completeness. Many FHP mangers consider a hard-copy alternative to an electronic data base susceptible to the capriciousness of electrical power, airborne contaminants, physical movement, or unintentional erasure as a mandatory safeguard of information. (Note: It is exactly this safeguarding of the data base that leads to the overwhelmingly negative response from maintenance managers when questioned about aircrews typing in their own flight information.) The absence of rapid access to reference documents in case of errors/inquiries/mishaps/computer failures is both intolerable and unacceptable. [Ref. 24]

Almost all squadrons maintain *some* type of hard-copy filing system of flight hour information. Some maintain the post-flight summary forms filled out by aircrew for a specific time period until the data base is considered accurate. Some still utilize the full NAVFLIRS form, or a single page reproduction, and file them within the Maintenance Department as historical reference documents. These practices tend to eliminate many of the man-hour savings and efficiency

benefits from the CANDE system through an unnecessary duplication of effort, even though the automated manipulation and reporting of flying hour information is still a definitive argument for program implementation. Fortunately, CANDE allows managers the option of printing out a daily or total flight hour summary form, and, if desired, individual flight summaries, to use as hard-copy records for easy reference and distribution. [Ref. 19] For the most part, user mistrust of the CANDE program is being overcome through increased familiarity. While the question of data back-up and access is certainly a critical point which must be adequately addressed by NAVAIR to the satisfaction of its customers, even *with* local data duplication efforts, continued and aggressive implementation of this management information tool is a significant step towards greater efficiency and cost effectiveness.

c. NALCOMIS

As with the previous two examples, the Naval Aviation Logistics Command Maintenance Information System (NALCOMIS) is a NAVAIR program designed to improve the capability and productivity of the current maintenance and repair documentation system through automation. It encompasses everything from the performance of Scheduled and Unscheduled maintenance on aircraft, to the initial component requisition by the originating unit, to its repair at an Intermediate or Depot level facility and return, to the issue of replacement stock from the supply system, as well as requisite documentation through each phase or maintenance. Aircraft components covered under this systems principally fall under two major stock codes [Ref. 26]:

- "W" purpose stock code – Fixed allowance authorized for a site, aviation-capable ship or shore, to support tenant activities/commands.

- "L" purpose stock code – Repairables positioned/reserved as "pack-up" kits for deploying units; carried by both ship and shore support units.

Note: "A" purpose stock code items, those controlled specifically by ASO, Philadelphia, PA, are held only by shore stations; they are managed within UADPS (see below) as before.

While its primary purpose is to manage "repairable" assets within the aviation maintenance system, it also has the ability to automatically interface with the Uniform Automated Data Processing System (UADPS) / Shipboard Uniform Automated Data Processing System (SUADPS) for the processing of requisitions for consumables. (Note: Financial accounting and inventory control is maintained in UADPS/SUADPS, not NALCOMIS). Basically, any maintenance-related action that previously required the use of a Visual Information Display System/Maintenance Action Form (VIDS/MAF), OPNAV Form 4790/64, can now be done electronically through the NALCOMIS terminals.

NALCOMIS was designed to occur in three coordinated and related phases [Ref. 26]:

- Phase I – Navy Repairable Maintenance Management (NRMM). A basic computer system; almost a prototype of the follow-on asset management system. Primarily implemented to modernize/automate the maintenance community; has been replaced on all but two sites (NAS Fallon, Nevada, and NAS Agana, Guam).

- Phase II – Deals with repairable asset management at the Intermediate (IMA) and Depot (AVDLR) level, as well as the base Supply Support Center (SSC). The squadron's only tie at that level is in requisitioning parts. First implemented on the East coast in 1989, it is fully established throughout the Active forces with the exception of the two aforementioned sites (which will be added with Phase III in FY 1993). Current NAVAIR schedules show complete transition of all CNAP forces to Phase III by FY 1997/8. (Note: The Reserve bases are currently in the process of equipping its installations with the appropriate equipment. RESFORONS based at Regular air stations are transitioned along with the rest of the site.) This phase requires specialized terminals, software, a communications/network capability, and the creation of a site-specific data base. It is "local" in the sense that it collects/uses information only from one site; one air station or one aviation-capable ship.

- Phase III – Deals with the individual squadrons/aviation support units (OMA) component repair and replacement. Initial implementation is only at the Fleet Replacement Squadrons (FRS's) within CNAP, somewhat more extensive in CNAL, but extremely scarce in CNARF due to Fleet priority of limited asset availability. This phase also requires specialized terminals/software/data, required for both air stations and aviation-capable ships, yet these support fixtures are exclusive of those allocated for use in Phase II; the major contracts for this equipment are expected to be announced by January 1993. Once the equipment becomes available, transition will begin on an "Air Wing by Air Wing" basis for operational continuity. This is an area where OMA units will get the most contact with, and benefit from, NALCOMIS. [Ref. 27]

Each of the Active Duty Type Commanders has a NALCOMIS Project Team responsible for the orderly and effective transition of a site to the new maintenance management system. Various subject-matter experts from the Project Team travel throughout the sub-claimancy setting up the NALCOMIS hardware, software, and training at designated Naval Air Stations/Facilities. The team normally arrives at the site six months prior to the planned conversion date, collecting inputs for the local NALCOMIS data base (e.g., stock records, types of tenant activities and Type Equipment Codes supported, AIMD's Individual Component Repair List [ICRL], organizational codes, Bureau Numbers of aircraft on board, Job Control Numbers [JCN's], Job Order Numbers [JON's], etc.). Once compiled, this data base is "cleansed" by ASO, then loaded on the NALCOMIS main frame computer, the basis for the local network.

About three months prior to implementation, the hardware (terminals, cables, etc.) is installed with data input/access points established at AIMD, base Supply, and each unit capable of requisitioning services/components from either of those facilities. Two months prior to conversion, training teams arrive to perform classroom instruction and "hands-on" training for squadron and station personnel utilizing "coop" vans (transportable classrooms, each with 15 operable NALCOMIS terminals connected to a generic data base). Prior to the Project

Team's departure, a NALCOMIS Project Manager billet (an officer), and supporting staff, is established with overall responsibility for the maintenance of the system. To ensure the accuracy and currency of the local NALCOMIS data base (e.g., initial input errors during the data collection phase, updated financial obligation/accounting information from FAADCPAC/LANT, transfer or aircraft into/out of a unit, changes in the Master Stock Item Record (MISR) at Supply, etc.), two Data Base Analysts (DBA's) are also assigned permanently to the site (one for Maintenance actions, one for Supply).

At the intermediate level and within the supply network, NALCOMIS Phase II has almost eradicated the use of the VIDS/MAF form (particularly among USMC commands). When a squadron inducts a component into AIMD for repair/replacement, some AMSU work centers will require a "turn-in" MAF to document the nature and extent of the problem; other screening units will simply have the squadron fill out a discrepancy summary form for the repair technicians. If a replacement part is available, it will be issued to the squadron and appropriate charges forwarded to the accounting department. If no parts are available, the part will be designated "Expeditious Repair", and AMSU will enter the part identification, nature of the discrepancy, appropriate maintenance codes, and originating unit into the NALCOMIS system before forwarding the part on to the cognizant work center. If the part cannot be repaired at that facility, it will be further designated as "Beyond the Capability of Maintenance" (BCM) and sent to the responsible Aviation Depot.

During the entire process, the NALCOMIS computer system is tracking the position and status of the part, continuously updated by repair technicians, supply clerks, and accounting staffers. (Note: Each "screen" is

called a "Conversation Code", upon which only one type of transaction may be handled; e.g., requisition, induction, maintenance, repair, BCM, etc.) This status is available to anyone on the network, from the IMA repair technician assigned to run the unit on a test bench for the initial check, to the base comptroller's staffer analyzing the squadron's obligations to date, to the squadron supply clerk verifying outstanding requisitions. NALCOMIS also allows squadron maintenance personnel to perform a Supply stock check on a part prior to submitting a requisition so that they know whether or not they must prepare the part for immediate AIMD turn-in or can expect issuance of a "shelf spare", allowing them to remove the part at a more convenient time. When ordering consumables, the squadrons can run a stock check to see whether or not they need to consider, or can afford, an open purchase of the item outside the supply system. [Ref. 26]

Phase III NALCOMIS, Organizational level activity, has also greatly reduced the paperwork burden while increasing the efficiency of the maintenance operations within the unit. As aircrew return from a flight, they fill out an aircraft discrepancy summary (some units utilize partially preprinted, single sheet VIDS/MAF's know as Hard Copy Notice's [HCN's], others a simple, formatted card). From this data, a member of the Maintenance Control staff inputs it into the NALCOMIS system, forwarding the information to the appropriate work center for action. Just like at the Intermediate level, the maintenance and supply status of the discrepancy is continuously updated by repair technicians and squadron supply personnel. This status is available to the mid-level managers in Maintenance Control at any time through their NALCOMIS terminal. When desired, an HCN may be printed to document any partial or completed

maintenance actions for hard-copy reference purposes. This is often done when reviewing departmental/work center/technician progress as it is easier to grasp the overall status when one can see the entire course of maintenance action. When reviewing the Conversation Codes on the NALCOMIS terminal, one can only see a single section of the electronic VIDS/MAF at a time. [Ref. 28] The Maintenance controllers may also call-up or print a summary of all squadron maintenance actions, supply requisitions, or aircraft status at any time. As an example of the confidence in, and flexibility of, the NALCOMIS system, VS-41, the S-3 Viking Fleet Replacement Squadron, has eliminated the use of their Maintenance Control VIDS Board, normally an absolutely essential maintenance action tracking tool. [Ref. 27]

As with the CANDE system, the NALCOMIS program has resulted in dramatic reductions in VIDS/MAF error rates. Much of the credit goes to the user-friendly interface, built in the format of an OPNAV 4790/64 form, familiar to all aviation maintenance technicians. Data entry is has also been "sailor-proofed"; the system will not *allow* an incorrect entry in any section of the electronic VIDS/MAF. (Note: This safeguard is only as effective as the accuracy and currency of the NALCOMIS data base; if there is erroneous data already in the system, it will allow more through invalid entries.) In fact, the NALCOMIS terminal will highlight the erroneous entry, while prompting the user towards other acceptable options, offering explanations as required. Data base accuracy is critical to the successful operation of NALCOMIS. [Ref. 28]

There are two areas in which NALCOMIS can assist in reducing extraneous charges: 1) Mis-ordering a part; and 2) Mis-documentation. When a squadron mis-orders a component (i.e., has an incorrect stock number, TEC,

etc.), it is usually because the person filling out the requisition MAF is using outdated manuals, inattention to detail, familiarity/complacency, etc. By screening all parts of the requisition MAF against the data base, the system can detect any errors and assist the individual at the terminal in correcting them. This can prevent unnecessary delays, and possible double charges, while reordering a part. Mis-documentation is normally a problem at the Intermediate maintenance facility, but can still result in double-charging of the requisitioning unit. If a part is inducted into AIMD as an "EXREP" item because of no "shelf spares", and a spare part later becomes available and is issued to fill the original requisition, the squadron could be charged twice for the part if "turn-in" credit is not applied to the "EXREP" part. Conversely, if "turn-in" credit *is* applied and the squadron is not charged for the part issued later, the base supply could be mysteriously minus one asset while the squadron gains a free (and illegal) spare replacement part. The NALCOMIS logic and data base cross-checking greatly reduce the likelihood something like that will occur. The majority of program cost savings, however, come in both the reduction in manpower requirements to track maintenance documentation and the significant savings in time, rather than in pure paper costs (the original, five-part OPNAV 4790/64 VIDS/MAF form costs $ 0.50 per copy; the new four part VIDS/MAF specifically for NALCOMIS costs $ 0.07 per copy; and a Hard Copy Notice costs $ 0.01 per copy [Ref. 26]).

Duplicating Fleet response to CANDE, those units incorporating NALCOMIS are strongly in favor of it. However, also just as with NAVFLIRS and flight hour accounting, there are many mid-level maintenance managers reluctant to go "VIDS/MAF free". Whether it is the relatively minor inconvenience of viewing a MAF one section at a time on the NALCOMIS terminal, or the

possibility that a critical slice of an aircraft's maintenance history could be permanently erased inadvertently, many squadron Maintenance Departments utilizing NALCOMIS (especially Phase III) maintain a hard-copy reference file (usually of HCN's) to document maintenance actions performed. [Ref. 29] NAVAIRSYSCOM proposals to eventually incorporate all aircraft and engine Logbooks and historical records within the NALCOMIS data base through future software developments. While this would notably decrease the tediousness of the meticulous record keeping requirements of aircraft ownership, this plan in particular has some personnel in the Navy cringing with apprehension about implementation. [Ref. 24]

C. ADMINISTRATIVE TRAVEL

The Operations and Maintenance (O&M) appropriation finances the cost of on-going operations for the Navy/Marine Corps [Ref. 4: p. A-19]. In addition to funding the continual operation of all ships, submarines, land forces, and aircraft, it pays for a vast majority of the miscellaneous day-to-day functions and expenditures incurred by these services. Among these non-categorical expenses is the cost of administrative travel, popularly referred to as Temporary Additional Duty (T.A.D.). Most T.A.D. costs are the transportation, berthing, and living expenses by unit personnel incurred in direct support of the unit's mission. Examples of this include the cost of sending essential aircraft support personnel on a weapons training detachment, the expense of sending a maintenance technician to a highly specialized training course to obtain a specific repair capability within the unit, or the cost of having the squadron Operations Officer attend a deployment-planning conference at the Air Wing commander's home base. While each of these activities is of definable worth and arguable

importance to various factions within the unit, they are all competing for rapidly-dwindling resources; OPTAR dollars.

1. APF / QPF and Funding Priorities

After months of budgetary planning sessions, and with guidance from NAVCOMPT on their "best guess" as to the outcome of the prospective Defense appropriations bill, the Major Claimants (CINCPACFLT, CINCLANTFLT, and CNAVRES) will issue the Annual Planning Figures (APF's) and Quarterly Planning Figures (QPF's) to the Type Commanders for Carrier Air Wing (CVW) Operating Targets (OPTAR) and Naval Air Station (NAS) Operating Budgets (OB) for the upcoming fiscal year. This guidance is officially promulgated via message traffic, normally in September. Guidance will also be given to the two Marine Corps force commanders, Commanding General, Fleet Marine Force, U. S. Pacific Fleet [CG FMFPAC], and Commanding General, Fleet Marine Force, U. S. Atlantic Fleet [CG FMFLANT], for further issuance to USMC Marine Air Groups [MAG's].

> The use of APF's allows the force/wing commander the ability to align resources as they deem necessary to achieve operational and training responsibilities assigned. Basically, an APF is a lump sum figure given to the operational commander which is divided between several aviation squadrons at his discretion. QPF's are used as another management tool for operational commanders to indicate to (the Type Commander) how annual funds should be allocated into quarterly portions, which also coincides with the time period which funds are granted by (the TYCOM). [Ref. 8: p. 22]

As the funding planning figures proceed down the administrative and operational chains of command, each command will provide more and more specific guidance through fiscal constraints imposed on budgetary limits during each spending period. As an example, the TYCOM divides its OPTAR among its Air Wings, giving more to those scheduled for deployment, less to others. The

Air Wing commander apportions his funds among the squadrons under his command, possibly "beefing up" a unit that is transitioning to a new aircraft/capability and will require more training flights, while shorting one that is experiencing severe maintenance problems and will not physically be able to fly a full flight hour program. The squadron commander also must dole out funds to different departments, each of which is rabidly trying to justify its proposed T.A.D. budget as being the most beneficial to the overall effectiveness of the command.

When these APF/QPF messages arrive at the TYCOM level, the limits are in the form of dollars. When they leave, using the latest "actual" CPH computations available, the limits are in the form of flight hours. In the latter portion of the OPTAR authorization message will be a section covering quarterly T.A.D. budgets. Apportioned corresponding to prior Air Wing/Squadron inputs, they define the spending limits for administrative travel for that time period. While additional funds may, of course, be requested from the issuing activity, supplements are rare and the units must prioritize their T.A.D. expenditures at all times. (Note: Once the Type Commander's allocated T.A.D. budget is expended, they may *not* transfer funds from other spending categories as a supplement. If more funds are needed they must apply for a grant to the Major Claimant, who may have to go to NAVCOMPT.) [Ref. 31]

It is altogether appropriate that the T.A.D. budget is included in the message that specifies the flight hour goals for each unit. This reinforces the fact there is an opportunity cost associated with T.A.D.; every dollar spent on administrative travel is a dollar taken from flying. This is the budgetary dilemma faced by operational units; while they *need* to perform administrative travel to support their Flying Hour Program, they must sacrifice a portion of their FHP to

do it. The difficulty of prioritization is compounded when one considers the "zero-sum provision" of OPTAR expenditure. While unit commanders are tasked with obligating 100 percent of their allocations, the perceived penalties of failure to achieve this goal differs depending on the category in which there was a surplus. If a squadron commander fails to fully expend all of his T.A.D. funds for a quarter/year, the worst that can happen is they will be redistributed to another unit within the Air Wing and, possibly, he could receive a lower portion the following year. This redistribution is easily done since T.A.D. dollars cost the same to all command, and there are never enough to go around; someone always has a planned expenditure waiting for an unexpected windfall. Conversely, if a flight hour goal is missed, the repercussions reach clear to NAVCOMPT and will most certainly affect future years funding negatively. Additionally, due to the CPH differences between aircraft T/M/S, it is not as easy to redistribute flight hours within an Air Wing and still achieve total expenditure of the Total Obligational Authority apportioned earlier based on planned squadron usages. Because of this fact, when a choice has to be made between a T.A.D. expenditure and achieving a flight hour goal, flight operations will receive priority almost every time.

2. COMNAVAIRPAC Initiative

Until recently, Type Commanders would allocate T.A.D. funds to the "Functional" Wing commanders (known as "Type" Wings in the Atlantic Fleet) for further distribution to individual squadrons. These Functional Wings (a.k.a., "Func" Wings) are Administrative commands, as opposed to the Air Wings which are Operational commands, usually a Flag position, and are differentiated by their location and aircraft Type/Model/Series they control; e.g., Commander,

Medium Attack/Tactical Electronics Wing, U. S. Pacific Fleet [COMMATVAQWINGPAC, or CMVWP] controls all active-duty West coast A-6 Intruders and all EA-6B Prowlers; Commander, Medium Attack Wing ONE [COMMATWING ONE, or MATWING] controls all active-duty A-6's on the East coast.

There has been a long history of conflict and discontent when it came to T.A.D. funding under this arrangement due to the fact the "Func" Wings did not have the same funding priorities as the cognizant Air Wings. Generally, "Func" Wings were trying to ensure each squadron received its "fair share" (if they could properly justify the expense); they managed the money as if it was *their* asset to be conserved and protected. The Air Wings, however, had to depend on the often capricious financial decisions of an independent command *involving funds set aside to support CVW events* in order to ensure a vital component of their total force would be able to participate in Operational training. On numerous occasions, squadrons had to reduce their manning levels or length of stay in scheduled Air Wing training evolutions away from their home base due to T.A.D. funding limitations imposed by their cognizant "Func" Wing. The result has often been intra-Wing rivalry for precious T.A.D. dollars, confusion on the part of squadron commanders as to which "boss's" wishes they needed to acquiesce to the most, and disjointed, inefficient training evolutions. [Ref. 9]

Beginning with Fiscal Year 1993, COMNAVAIRPAC is attempting to address this management problem by implementing a new distribution method for T.A.D. funds on a trial basis. In addition to the flight hour goals given to the Air Wings, they are given quarterly T.A.D. funding limits for each squadron which they now have complete control over. While the actual dollars will still be

deposited in the accounts of the Functional Wings (since the squadrons are usually co-located with their "Func" Wings, and the local financial activity documents actual fund expenditure), various amounts will be "fenced" for each squadron. The Air Wings will then authorize the transfer of those funds to the squadrons for use in administrative travel. The Functional Wings will retain administrative reporting responsibility for T.A.D. funds since they are familiar with the requirements and manned for the additional administrative burden (whereas the Air Wings are not), but will have no say in how the funds are actually dispersed. In addition to the normal T.A.D. dollars the Air Wings will have control over, there will be a new spending category, "Plus Above for 7F". With this option, the Air Wings will be authorized to take up to thirty percent of their 7F money (normally for aviation fuel expenses) and augment their T.A.D. budget *if* they have to. The overall goal of this new fund management/distribution plan is to give the CAG's more control over where their T.A.D. money is spent; since they know what the operations are, they know where the money needs to go. While initial reception of this plan has been overwhelmingly positive from *all* commands concerned, the effectiveness of this plan will be reviewed at mid-year to see if it should be continued or not. [Ref. 31] (Note: CNAL, while interested and monitoring the results of the CNAP trial program, is still forwarding all T.A.D. funds through its "Type Wing" commanders as before. CNARF, on the other hand, due to its small relative size and the fact Functional Wings are a purely active-duty command, already distributes its T.A.D. funds directly to its Air Wing commanders.)

D. SUMMARY

In this chapter a number of burgeoning problems associated with the Flying Hour Program have been analyzed. The apparently expanding effect on readiness and aircraft availability due to the increasing age and usage of aviation assets in the Fleet was discussed. A review of Cost Per Flight Hour cost drivers and three management initiatives to automate maintenance documentation then followed. Finally, the traditional dilemma of T.A.D. expenses versus flight hours was investigated, highlighted by a novel CNAP proposal for fund disbursement. The last chapter will provide conclusions based on the thesis research and will address the original research questions delineated in Chapter I. Suggested topics for further research in this and related areas will conclude the thesis.

V. CONCLUSIONS

A. PROSPECTUS

As the specter of Communist world domination rapidly dissolved along with the Soviet Union in 1991, the United States found itself the planet's premier military power. Unfortunately, there exists a dearth of credible foes to validate this formidable force. During the time the national consciousness of Americans was turned from international to internal affairs, a growing cry for a "peace dividend" arose, heard by congressional leaders facing a long campaign with their constituents in the upcoming elections. As the national economy wavered and administrations shifted, the national debt could no longer be ignored. The expansive military build-up of the 1980's stalled, and then in the 1990's began to reverse dramatically as the Department of Defense budget took its share of the burden of trying to address the deficit and economic woes of the nation. While the military budget shrank, areas in which to economize were sought. Inefficiency, waste, and extravagance gained national attention and scrutiny as congressional budget hearings vilified agencies unable to sufficiently justify their existence. As a new administration takes power, it becomes clear there are no "safe" programs. Projects once thought as inviolate must now fight for the funds available along with every other budgetary line item; *everything* will be negotiable; there are no "sacred cows".

Despite the public's view through the media, Naval Aviation is more than the standard CNN "video bite" of an F-14 Tomcat launching from the bow catapult of an aircraft carrier. It has proven itself, time and time again, to be a legitimate and

complementary partner in the sea service's strategy of power projection and freedom of the seas. While purists reminisce about battles like Coral Sea, Midway, and the Mariannas "Turkey Shoot"; historians would add succeeding examples such as the Pusan perimeter, Haiphong harbor, Yankee Station, the Hanoi ferry, the *Mayaguez*, Close Air Support (CAS) in Grenada, Fitter C's and terrorist barracks/airfields in Libya, the Kuwait City highway, and Baghdad, as evidence of the operational effectiveness of Naval Aviation.

The size and scope of the naval air forces are now in question. As the Department of Defense's budget declines, so does its force level. The service can no longer afford to maintain the current level of personnel and equipment in light of the probable funding levels to be appropriated by Congress in the future. Given the unsympathetic mood of the voting public, it is unlikely that this "belt-tightening" by the House of Representatives and Senate is just a temporary phase to be endured until the military returns to the glory budgets of the 1980's. The reduction in forces is real, traumatic, and, at least for the foreseeable future, permanent. Just how the leaders of the Pentagon deal with this fiscal dilemma is not just a question of character and morai strength, but one of intelligence and of basic economic principles. Inefficiency, waste, and extravagance have no place in the military of the future. Each aspect of operations must be carefully reviewed for cost effectiveness and overall contribution to national defense.

In view of this growing budgetary dilemma, the various aspects of the Navy's Flying Hour Program delineated in Chapters II, III, and IV will be reviewed to examine possible options, or hindrances, to increasing the efficiency and effectiveness of flight hour costing.

B. FLYING HOUR PROGRAM BUDGETING

Naval Aviation can expect to find itself fighting for its own financial existence with every budget cycle input. It must find ways to justify its continued funding by demonstrating itself to be the most economic alternative in any applicable role required by the national military strategy. As stated previously, however, there is currently no precise way to measure expenditures versus readiness; no way to determine "how much bang we get for the buck":

> Development of flying hour requirements for the services has become more important as aircraft and missions have become more complex and budgets have grown more constrained. At the present time, the services develop their flying hour programs via the exercise of professional judgment. They decide what training events must be repeated with what frequency in order to achieve and maintain various levels of proficiency. This is a reasonable approach, but it leaves one with a flying hour requirement that is not explicitly validated in terms of the proficiency or safety of aircrews. The scarcity of resources has increasingly led to the request that flying hour budgets be justified in terms of improved operational capability. In other words, those responsible for the budget--in the services, in OSD, and in the Congress--want better evidence about what we are getting for the money we spend on the flying hour program. In the absence of such evidence, it is likely to become increasingly difficult to justify funding for the flying hour program. [Ref. 32: p. 11]

As the cost-cutting sets in, it must be tempered with the need for maintaining a viable, albeit smaller, force structure. While every attempt must be made to economize and simplify the naval air forces, reducing them to a "hollow force", unable to perform their mission due to insufficient training or support, would be the height of inefficiency through mismanagement of available resources.

> The traditional preference of the military services in peace time . . . has been to emphasize investment, expanding or modernizing the force (or both), and giving research and development (R&D) efforts a "head of budgetary steam" to ensure against an uncertain future. The impulse is to "get while the getting is good." "Technology," runs the argument, "is America's strength. In a crunch, people and readiness--the core of the Operations & Support (O&S) accounts--can be quickly obtained. If freeze we must, the O&S-intensive options is best."

> One risk inherent in this approach is that the ability of U. S. military forces to deter aggression may weaken if tomorrow's big-ticket items are funded at the expense of today's combat effectiveness (a function of readiness, skill, sustainability, and other factors largely funded under O&S). If the world is a volatile place, then perhaps the marginal dollar should be allocated to reduce immediate risk, by emphasizing readiness. Moreover, military modernization itself has called a basic premise of the O&S-intensive school into question: it is not clear that both readiness and appropriate people can be obtained quickly in a crisis. High technology requires high skill, and high skill cannot be acquired quickly. [Ref. 25: p. 48]

The tendency to resort to the most expeditious, dramatic, or exploitable (in a public relations sense) option when reducing expenditures must be continuously guarded against. Destruction of the military's infrastructure *must* be avoided.

Part of the problem in establishing a predictable Flying Hour Program financial base in a fiscally dynamic environment is the flexibility and transitory nature of the Appropriation from which it is funded, Operations and Maintenance (O&M). When agencies/services are asked to absorb costs or produce an immediate budget reduction, the O&M account is a likely target due to its characterization as "fast money". [Ref. 25: p. 50] While the fluidity with which financial managers can manipulate O&M funds within the appropriation certainly eases the task of responding quickly to operational needs/training deficiencies, it also makes it simpler to reprogram funds *out* of the FHP arena when deficiencies arise in other areas. (Note: Transfers of funds from one appropriation to another requires prior Congressional approval. Reprogramming of funds *within* an appropriation is simply reported biannually to Congress, via OSD, after the fact.) [Ref. 7: p. 73] Not only does this practice of reprogramming for convenience nullify the financial plans and goals upon which the budget inputs (and subsequent Appropriation) were based, it often tends to alienate congressmen who voted for the budgetary line items for DoD.

While the goal of the Planning, Programming, and Budgeting System (PPBS) is to make the most efficient and effective allocation of resources to meet national defense objectives [Ref. 33], it succeeds more as a budgetary process than an economizing agent. As illustrated in Chapter II, the resultant Defense Budget, and subsequent Congressional Defense Appropriation, are oriented towards full utilization of allocated funds, *not* conservation of assets. If a squadron, through aggressive flight scheduling and exceptional maintenance support, is able to surpass expected (and allotted) flight hour limits for a given period, they may be "rewarded" by being supplemented with flight hours originally assigned to less-productive units. If no "extra" flight hours are available from its chain of command, the recourse is to cease operations until a new funding cycle begins so as not to overobligate itself. Conversely, if a squadron embarks on an ambitious fuel-usage and aircraft-stress reduction program while still achieving its PMR goals, it will in all likelihood, be penalized with a flight hour reduction during the next budget cycle *at least* equivalent to the hours "saved" by their conservation efforts. The current budgeting process not only doesn't promote efficiency, it encourages inefficiency.

Whether one is a Unified Fleet comptroller juggling operational taskings held-over from the Cold War era, or a squadron supply clerk prioritizing SERVMART requisitions while hoping for some relief on "unfundeds", it is clear that the financial prospects for the foreseeable future are, at best, gloomy. Terms such as financial stress, cutback management, retrenchment, efficiency, accuracy, austerity and program termination become prevalent in a period of constrained resources [Ref. 25: p. 54]. When faced with reduction options, as both initiators and receivers at either end of the monetary pipeline for the Flying Hour Program,

OPNAV/NAVCOMPT and the Type Commanders each react in accordance with their priorities [Ref. 25: p. 55]:

> Allocators will: ... (1) Allocate less to various places and activities; (2) Lower their output expectations; and (3) Try to get those to whom they allocate to operate more efficiently.
>
> Organizations receiving allocations will respond by: ... (1) Seeking to be allocated at least as much as they have been; (2) Arguing they cannot or should not lower their output expectations, but eventually doing so to avoid the frustrations of too wide a gap between goals and achievement; and (3) Arguing they are operating as efficiently as they can, but simultaneously seeking to be more efficient so as to minimize the output effects of the input reductions.

As relationships between the budgetary participants become strained, communications may break down, cooperation may evaporate, and effective management of their jointly-owned sustenance, flight hour dollars, may plummet. As "aviation fiefdoms" are established, their moats ever widening, intraservice rivalries and feuds are evident as budget program dollars are under competition.

What the "budgeteers" and the "operators" need to realize is that their individual concerns for military economic efficiency and military effectiveness *can* produce the same result; they are *not* mutually exclusive [Ref. 3: p. 30]:

> The military services always (and properly) want more; the economizers always (and also properly) offer resistance, or try to impose reductions. But, once the budget has been determined, there is no longer conflict of interest.
>
> In fact, choices that maximize military capability for a given budget are the same choices that minimize the cost of *attaining* that capability.

If one defines efficiency as "the inability to produce one more unit of output without sacrificing another" as opposed to some general sense of "making good use" of something [Ref. 3: p. 29], it becomes clear that both ends of the budgetary spectrum could, and should, be working towards the same goals. Elimination of the parochialism and antagonism between the Type Commanders

and OPNAV/NAVCOMPT could go along way towards presenting one united, aviation-oriented front against the rapidly approaching onslaught of the budget-cutting nemeses on Capitol Hill.

C. COST PER FLIGHT HOUR AND VARIANCES

In addressing the primary research question whether there are more "accurate" methods than historical data to predict flight hour costs, the answer is yes and no. As shown in Chapter III, while N889E utilizes a modified three-year average of historical Costs Per Flight Hour as reported by operational units separated into defining cost pools, the Type Commanders base their inputs on actual expenditures per category (in truth, "obligations" are used instead of "expenditures" due to the timeliness of reporting and accountability, but this may be a trivial differentiation). Both techniques have their individual advantages and disadvantages, with command perspective the final determinant on which is "best".

The averaging concept used by OPNAV smoothes out the costing vacillations over time as desired, and provides the financial managers a relatively stable guideline within which to predict future flight hour funding requirements for budgetary purposes. Because it *is* an average, however, it continually lags behind in periods of unexpected price increases, reflecting changes in valuation and pricing trends too slowly to be of any benefit to the units for which they budget.

The Type Commanders, on the other hand, "operate in the real world". Since they allocate resources to fund the day-to-day operations of the forces under their command, they must deal with "actual" costs. Although historical data is used in budget submission and quarterly allocation of appropriations, *they* are the

ones who must find the additional money to pay for unexpected price increases today; they cannot afford the luxury of deferring payment for three years until an average expense figure can be computed and funded (which, since it is an average, would be less than the unplanned peak cost anyway).

Each of the respective commands has developed their unique flight hour costing system to suit their individual needs. Since the federal budgetary process is dictated by the President, OMB, and the Congress, and the DoD budget is directed by OSD, it appears unlikely that OPNAV/NAVCOMPT will change their methodology in the near future. It is just as unlikely that the Type Commanders, tasked with managing and financing an inherently dynamic organization with a fairly inelastic demand for a continuous stream of goods, will be able to shift to less timely or responsive costing and financing system. At best, these two organizations can simply acknowledge their differences and try to work on the inevitable differences with renewed purpose and dedication.

There is little question about the fact that variances in the Cost Per Flight Hour computations between operators and budgeteers *do* exist; the dilemma is in how to *control* them. Variances in the flying hour program are reviewed at the level that is meaningful, evaluated for program effect, and reflected in future budget submissions [Ref. 1: p. 45]. While the budgetary hierarchy tracks and evaluates these variances, operating units are encouraged to practice aggressive resource conservation as a general policy. As FHP expense data is compiled at the TYCOM and OPNAV/NAVCOMPT levels, a host of mitigating costing factors must be considered, not the least of which is misleading information inputs by the reporting units.

> One of the reasons the flying hour program is difficult to measure in meaningful and quantifiable terms is its susceptibility to manipulation at the

operator level. The same returns can be gained from an over or under funded program. If underfunded, cost savings measures may be imposed so as to use less fuel and get more flight time for the dollar. Some of these measures include:

- Limit flights to those that do not use as much fuel (e.g., high altitude and instrument flights, restricting afterburner use, reduced speed or aircraft maneuvering on training missions, etc.).

- Reprogram hours into lower CPH aircraft (e.g., from jets to propeller-driven aircraft or helicopters).

- Change type of flying (e.g., use training ranges closer to home base, restrict high fuel-usage flights/maneuvers, eliminate "non-essential" flights, etc.).

- Substitute increased flight simulator time for aircraft flights. [Ref. 6: pp. 81-82, 103].

While these cost savings may bring favorable comments from the unit's local comptroller, they may be temporary in nature, and may tend to skew the derivation of an accurate and representative CPH (and gained at the expense of realistic and beneficial training).

While the Navy and Marine Corps make a potent and effective combined force, they each have their own unique requirements and methods of operation. The training, organization, composition, and utilization of their respective air forces differ, often dramatically, yet they are funded using the same formulae and criteria. While PMR is a realistic factor for carrier aviation forces, it has very little to do with those aircraft assigned to a MA (even if they are the same T/M/S). Although the USMC equivalent readiness rating system (Combat Readiness Percentage [CRP], taken from their Training and Readiness Manual [T&R] syllabus) also establishes a qualification goal of 80 to 85 percent, there is no direct correlation between these objectives and the purely TACAIR/ASW concept of "PMR" [Ref. 6: p. 34]. Despite this fact, a limiting PMR factor is applied to all

BA-2 tactical aviation budget line items by NAVCOMPT, regardless of service affected.

In dealing with the PMR factor, there is much consternation among Fleet scheduling and planning personnel at the Type Commander level over the fact that is applied as an *average* and is not truly reflective of the operational needs of the units affected. At any given moment, a squadron will be at some point in a gradually intensifying training regimen in preparation for their next deployment (see Chapter III, p. 47). The PMR percentages associated with this "work-up" cycle are relative to the flight hour requirements for each segment and at no time are equal to the allotted "average" PMR of 83 percent (for Fiscal Year 1993). To address this discrepancy, some Fleet commanders have advocated that funding be tied to OPTEMPO utilizing a Total Mission Readiness (TMR) factor instead of PMR. TMR is more flexible in that it is tied to scheduled operational events/milestones within a "work-up" cycle, it is also easier to quantify changes in terms of dollars and flight hours than with PMR. While it is administratively possible to tie FHP funding to the deployment cycle due to congressionally-mandated biennial budget submissions, the annual appropriations cycle and review prerogatives retained by Congress negate this option. Problems remain in the fact that the TMR program, while providing a more accurate representation of unit requirements, is more costly to implement than PMR, which is also the accepted standard of OSD and Congress. [Ref. 6: pp. 85-86]

The nagging problem of "Non-PMR" flight hours (those which do not directly contribute to PMA qualifications) is also aggravated by one's point of view. In the category of "staff" hours, the Marine Corps leadership deems them absolutely

vital to combat readiness. However, the aircrew "bumped" by staff pilots may have a different viewpoint [Ref. 6: pp. 89-90]:

> The Marine Corps sees the staff pilots as the first line of combat augmentation to squadrons in a wartime situation . . . The squadrons, for the most part, look on staff pilots as an evil that must be tolerated and would support reductions in staff flying.

It is inevitable that a certain percentage of flying hours must necessarily be utilized for non-training events. Aircrews tend to argue that *any* time spent in the cockpit is beneficial as it increases the "comfort level", crew coordination, flight sense, basic proficiency, etc. of the aircrew involved. However, if those hours do not result in measurable increases in combat readiness qualifications they are not budgeted for in the squadron's OPTAR and are not funded by NAVCOMPT. (Note: There *are* some minor miscellaneous categories listed in the OP-20 which cover this area, but not to the extent experienced by operational units). Until a definitive link between a specific unit of flight time and the resultant combat readiness can be proven, it is unlikely funding agencies will adequately address this anomaly.

As analysts and accountants scour the Flying Hour Program in an attempt to trim the last bit of "fat" from its budget, the question of substituting flight simulators for aircraft flying hours continually resurfaces.

> . . . The current Navy policy on flight hour substitution is that flight simulation utilization is a basic building block in the total training program. It is not the Navy's intent to use simulators to replace the aircraft in training, but rather to augment and enhance training in the aircraft to the maximum effective extent . . . Although Congress and OSD keep asking for more simulator usage and look for the cost savings, the operating community has found that they can only do so much and cannot replace actual experience. With flying hours limited, the experience value of actual flying time is very high. Although there may be a dollar cost saving when one hour of flight time is replace with one hour in the flight simulator there *is* an opportunity cost of experience that cannot be measured. [Ref. 6: pp. 71-72]

In view of the phenomenal growth in both cost and capabilities of state-of-the-art flight simulators, it is difficult to imagine that concerted pressure will not be forthcoming from congressional appropriations committees for a higher percentage of usage/replacement than the current two percent.

At the Type Commander level, two options to respond to this problem may be of some interest: 1) Using "running" CPH totals rather than FYTD; and 2) Aggressive monitoring of OPNAV reports "in progress". When working within the constraints of an annual budget, the erasure of all previous data and starting "fresh" on 01 October every year may be a funding reality, but it is a statistical nightmare. Short-term perturbations in Cost Per Flight Hour computations possess an unrealistically dramatic effect until enough data is accumulated over time to lessen their influence. By utilizing a running twelve-month data base of reported obligations from the BOR's/FHCR's, a truer average CPH per T/M/S could be achieved. Since these figures are simply a representation of the "actual" figure over time, they would not affect actual fund obligation over fiscal year boundaries, only the prediction of its usage. (Note: There is no real reason to limit it to twelve months, that is simply the maximum data base currently utilized by the TYCOM's. It is certainly plausible to use a 36-month average, thereby approximating the figures computed by N-889E.) The capability of checking the work of OPNAV "in progress" is inherent within the Flight Hour Cost Reporting System. *Every* program run by N889E can be viewed by the TYCOM's on their computers. By aggressive monitoring, CPH variance-enhancing discrepancies can be addressed in a timely fashion rather than waiting until distribution of the particular report in question. [Ref. 17] An additional proposal by CNAP staffers for the Type Commanders to assume responsibility for the OP-

20 report is also under review. Due to the reporting and information distribution requirements of the Resource Management System (RMS), however, it may not be possible (or *desirable*) to eliminate OPNAV/NAVCOMPT input from this budget exhibit.

The establishment of a formalized, traceable, timely grievance procedure for Type Commander's to utilize when dealing with OPNAV or NAVCOMPT on issues of flying hour program discrepancies could be highly desirable. Rather than the current system of waiting for the issuance of the OP-20, then reacting in an effort to forestall potential losses in flight hours, if the TYCOM's had a clearly delineated program of options and procedures when dealing with N889E much apprehension and animosity could be avoided. While financial managers at OPNAV *do* consider the wants and needs of the Fleet when determining budget recommendations to NAVCOMPT, the perception at the operational level is that it's "us versus them" in many instances. A clearly-stated guidance for *both* sides, while possibly reducing the informality of communications between the offices, would go a long way to defining the roles, rights, and responsibilities of all parties concerned.

Finally, increased coordination, cooperation, and communication between OPNAV/NAVCOMPT and the Type Commanders is paramount. TYCOM's themselves, each operate on a separate agenda and schedule. Traditionally, the intercoastal coordination requirements to simply issue a joint position paper between COMNAVAIRPAC and COMNAVAIRLANT has been a laborious, drawn-out affair producing an overly-compromised, less-than-desired policy statement. CNARF, on the other hand, while invited to participate in major conferences or planning sessions, does not deal with the same operational or

funding issues, chain of command, or congressional support as its Active Duty counterparts and is not usually a primary contributor in the resultant decisions or policies. [Ref. 9; Ref. 14; and Ref. 23] While there *is* an annual Flying Hour Program Conference for all major participants, the dynamic nature of the program necessitate a more frequent "meeting of the minds" (a need supported by the fact the "annual" conference was held twice in FY 1992 due to pressing problems). Granted, personnel scheduling and T.A.D. limitations being what they are, it may not be possible to physically collect all the "prime movers and shakers" in one room more than once a year. However, conference telephone calls or emerging technologies such as video-conferencing, done on a Quarterly basis, might enhance the mutual understanding between participants at all levels of the Flying Hour Program. A greater degree of freedom and honesty in intra-service communications is becoming mandatory for the well being of Naval Aviation.

D. AIRCRAFT PROCUREMENT

The largest expense areas (approximately ninety percent) in flight hour costing are those forces falling within the BA-2 budget activity. The vast majority of spending under BA-2 auspices are those associated with Tactical Air/Anti-Submarine Warfare aircraft. Hence, the driving force for the Navy and Marine Corps air assets is TACAIR/ASW; essentially, carrier aviation and Marine strike aircraft determine the health and future of the Navy's Flying Hour Program. Given this fact, the relatively unrelieved aging of Fleet aircraft, particularly those airframes in the aforementioned obligation-determining categories, is contradictory to the development, or even continuance, of a viable and effective power projection capability.

The future looks bleak in terms of Naval Aviation asset renewal. In Chapter IV the procurement plan for follow-on/replacement models was discussed; there is no expected relief for the Fleet's "tired iron" until almost the turn of the century. Compounding this predicament is the reduced procurement of new/remanufactured/back-fit current model aircraft necessitated by constricted Aircraft Procurement Navy (APN; "Blue/Green Dollars" in that this appropriation covers the aircraft purchases for both the Navy and Marine Corps) [Ref. 34]:

TABLE 5-1: DON BUDGET REVIEW - SYDP CHANGES TO POM 94 APN

AIRCRAFT T/M/S	FY 1994	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999
EA-6B	0	6	6	6	12	12
F/A-18C/D	36	36	36	24	0	0
F/A-18E/F	0	0	0	12	24	24
CH-53E	16	0	0	0	0	0
SH-60B	7	7	7	7	17	17
SH-60F	12	12	17	17	7	0
HH-60H	12	12	7	0	0	0
AH-1W	12	12	12	12	12	3
T-45	12	24	30	30	30	30
TOTAL	107	109	115	108	102	86

Table 5-1 shows that the Strike/Fighter community (F/A-18) is the only one with a confirmed and (prospectively) funded growth and asset replenishment plan. This would indicate a shift in the mission and warfare-fighting concept,

especially in carrier aviation, from a long-range, power-projection mode of carrier battle groups to one of localized, high-intensity/short-duration littoral conflicts. Given the fact that congressional economizers, goaded by Air Force proponents of the B-1 and B-2 bombers as "fulfilling the power projection needs of the nation in this new order" [Ref. 21: p. 93], are already questioning the usefulness and necessity of further investments in nuclear aircraft carriers and their requisite air wings, this new strategic course could well accelerate their demise.

E. MAINTENANCE AND REPAIR COSTS

In the past, aviators at the "operator" level (i.e., Fleet squadrons and aviation-capable units) have concerned themselves primarily with managing flight hours, not budgeted dollars. While unit Commanding Officers were conscious of OPTAR limits and made every effort to conserve allocated assets, this was done primarily as a response to underfunded requirements, not as a comprehensive fiscal policy. In fact, since operational units are specifically designated as "Cost Centers" [CC] within the Navy's accounting system, squadron Commanding Officers are not subject to Title 31, Section 1517, restrictions or penalties for over-obligation of allotted funds. That responsibility usually falls on the Fund Administering Activity [FAA]; their Air Wing commander or home station comptroller. This technicality does not mean they are any less cognizant of the absolute limit of their Total Obligational Authority. [Ref. 4: pp. D-10, 11].

With the advent of the DBOF, unit costing, and having to subsidize/pay for military personnel services under a complete DBOF system, unit commanders, Operations Officers, and aircraft maintenance managers need a heightened awareness of basic accounting principles, cost/benefit analysis, and the concept of pricing. While the Navy has mandated Total Quality Leadership (TQL) as an

avenue in which to improve management in the areas of effectiveness and customer services, DBOF will force the Fleet's attention on economic efficiency. Once the *true* impacts of this new operating system are fully understood, a multi-phase program of awareness and procedural training to primary participants must be implemented at all levels so as not to excessively waste precious resources as users "move up the learning curve". This training could be as basic as Plan of the Day notes, guest lectures during work center training, or inclusion of generic cost-awareness questions on enlisted advancement exams, to "Management Standdowns" where flight operations are discontinued for a concentrated, "all hands" training session, or required business administration courses as part of the established Prospective Commanding Officer/Executive Officer training syllabus or elsewhere. The advent of the DBOF, with its costing/pricing aspect, that is confusing to the appropriation-based tradition of military budgeting, coupled with the fiscal realities of the vanishing resource base, urgently dictate the need for an ambitious and innovative education and training solution.

One positive initiative in the area of aircraft maintenance and repair is the move towards force-wide automation of administrative documentation requirements (e.g., CANDE, NALCOMIS). Whether it is an attempt by NAVAIRSYSCOM to battle entrenched cyberphobia within its forces, a response to the Corporate Information Management (CIM) initiative directed by OSD, or simply bringing the Navy into the Twentieth century in data manipulation, this is a much-needed change. The aspect of Aviation Safety, however, has brought the trend towards a "paperless Navy" under a microscope. In the event of an aircraft ground or flight mishap, all documentation concerning the aircraft and its crew is *immediately* "sealed" for review by the Mishap Investigation Board (MIB). The

prospects of having to wait until the data can be printed out for the Board's use, the absence of critical indicators such as Collateral Duty Inspector (CDI) initials on VIDS/MAF's, not to mention possible loss due to inadvertent action by some inattentive clerk or technician, are just now being addressed at the Naval Safety Center.

At best, these disadvantages could delay the start of a mishap investigation momentarily; at worst, they could lead to a causation determination of "Unknown" due to a lack of documentary evidence or history, risking the recurrence of the exact same type of accident when it could have been prevented if only the proper documentation had been present to determine the original cause. Conversely, there are also some significant advantages to the NALCOMIS program when performing a Mishap Investigation. With all maintenance, supply, and flight hour information in the form of a computer data base, it will dramatically increase the speed at which investigators can review, search, and discount data for specific factors or indicators, e.g., if an aircraft landed "gear up", one initiate a search of all VIDS/MAF's dealing with hydraulic failures on that aircraft, or the records on hydraulic contamination training within the Airframes work center, or the flight record of how many touch-and-go landings the aircraft has had in the last month, etc. One proposal is that the NALCOMIS and CANDE incorporate an *automatic* and *completely separate* information back-up system for all input data. This process should be transparent to the user, and impossible to delete at the squadron level. [Ref. 30]. Although there are many positive aspects to an aggressive transition to the "paperless" NALCOMIS and CANDE programs, the issue of Aviation Safety must be addressed thoroughly before fleet-wide implementation is undertaken

One final caveat on the TRiX readiness monitoring system. While the system is still currently being tested at selected units in both Active Duty sub-claimancies, after over twelve months of software development at a cost exceeding $ 150,000, the basic program is nearly complete and has already received the official support of both Type Commanders, a notable accomplishment in itself. Unfortunately, in August, 1992, representatives from the Strike/Fighter community at NAS Lemoore, California, presented a different readiness tracking system to COMNAVAIRPAC to preclude the incorporation of TRIX. This alternative, complete with a data base, readiness reports, and point accumulation system, all oriented around the F/A-18 training syllabus (which, arguably, is the most modern and comprehensive in Naval Aviation today), was rejected by the Type Commander. This was due to the demonstrated success of TRIX during evaluation, the program's universality among aircraft T/M/S, the imminent dissemination of it to the Fleet, its wide acceptance by commanders and users alike, and the extensive time/money already invested in TRIX. The representatives from Lemoore then petitioned a TQL Process Action Team (PAT) for a decision on the greatest overall benefit to the Fleet between the two competing systems, which sided with the F/A-18 people. Armed with this support, the issue has been forwarded by the Strike/Fighter contingent to OPNAV for a decision. This matter is currently "under review". Until a determination is made, TRIX will go no further than the test and development stage. [Ref. 9] This takes the decision of determining of the "best" product out of the hands of operational users an places it at a higher administrative level due to fractional rivalries. The time for this decision was *before* the time and funds were expended in developing the TRIX program.

F. ADMINISTRATIVE TRAVEL

Unfortunately, military personnel are sometimes forced into making the choice between having to forego a fortuitous event which will greatly benefit themselves or their unit due to limited T.A.D. funding, (e.g., canceling a sorely-needed and difficult-to-obtain training course quota, reducing the number of maintenance support personnel on a detachment), or paying for the opportunity "out of pocket". While retrenchment and austerity are significant factors in these shortages, administrative travel fund mismanagement also appears to be a prime contributor to the problem. Granted, there *are* unavoidable instances necessitating T.A.D. supplements (e.g., sending a repair crew to a distant base to rescue an inoperative aircraft, adding additional support personnel to a detachment due to increased tasking from higher authority, etc.), but these are generally funded from the withheld funds and not questioned by the activity supplying the funds. Examples of mismanagement of funds range from underestimations of T.A.D. requirements by the squadron Administrative Officer while formulating annual budget inputs, to endless congressional inquiries and demands for superfluous justification in an area targeted for investigation of fraud, waste, and abuse. Administrative travel funds are not easily obtained and too often wasted.

These facts make the COMNAVAIRPAC T.A.D. distribution initiative all that more critical. Taking the authority *and* responsibility for funding and putting it in the hands of the operational commanders to dictate where it is spent, may seem like a logical concept, but it is new to the Regular Navy. Success in this administrative effort could just start a trend towards responsible and accountable fiscal management, and none too soon.

One proposal by a CNAP budget specialist is to include administrative travel fund information on the monthly Flight Hour Cost Reports to OPNAV/NAVCOMPT. Since the data is readily available and could easily be included on squadron inputs to the TYCOM's, this modification *could* serve to reinforce the inextricable bond between T.A.D. funds and the effective pursuit of the Flying Hour Program. Administrative travel is indeed affected by CPH computations, particularly when variances cause the reprogramming of funds, but the management of that aspect of Naval Air is primarily an "in-house" matter and rarely reaches beyond the Major Claimant after the original budget submission. Adding these data to the FHCR's might reinforce the connection and importance of these two factors to those who must justify the budget requests from operators within DoD and before Congress.

G. SUMMARY

In this final chapter each of the major topic areas of the previous chapters was addressed including current problems encountered with FHP administration and proposed solutions. The subjects of Flying Hour Program budgeting, Cost Per Flight Hour determination, slowdowns in aircraft procurement, increases in aircraft maintenance and repair costs, and administrative travel were analyzed in response to the Type Commander guidance that originated this effort. The FHP is faced with a considerable management challenge. As funding is slashed, its forces reduced, its assets depleted, and its justification for existence questioned, Naval Aviation must find within itself a new spirit of cooperation and unity of purpose. Parochialism, intra-community competition, close-mindedness, and resistance to change can only lead to a divided and weakened service, relegated to a subservient role in the defense of our nation. Only through insightful

leadership and visionary thinking can the true effectiveness and strength of Naval Air be guaranteed.

H. SUGGESTED TOPICS FOR FURTHER RESEARCH

The closer the analysis of the Flying Hour Program, the more questions that arise. This thesis provided a perspective on only a few of the numerous problems associated with the financing and support of Naval Aviation. Additional research in the following areas could provide significant benefit to FHP managers and participants:

- Is hard-copy documentation of flight hours, maintenance expenditures, and training/readiness data necessary? If so, how can the CANDE, NALCOMIS, and TRIX programs be modified or manipulated to provide it? How can the concerns of the Naval Aviation Safety Program be adequately addressed concerning hard-copy documentation?

- Should the TYCOM's revert to some form of historical averaging in determining their CPH (like N-889E) in order to eliminate short-run "spikes" due to unexpected but often temporary, fluctuations in maintenance and repair costs? Or should OPNAV (i.e., N-889E) decrease their averaging "window" (from 36 down to 12 months) in order to more accurately reflect rapidly changing prices for maintenance, as well as OPTEMPO fluctuations?

- What is the actual cost in dollars to the Navy for the cancellation of the A-6F/G, A-12, F-14D, P-7, (and, in all likelihood, V-22) procurement programs in terms of lost opportunity and additional, unnecessary expense? What are the current community plans for stretching the available assets in each of the VAM, VF, and VP communities, and what are the anticipated expenses incurred due to the delay in replacement platforms?

- If implemented, what is the impact of TRIX on Fleet readiness reporting? Are there any discernible increases in actual readiness qualifications over the previous Liberty Elite monitoring system? If the challenge by the Strike/Fighter community is successful, what are the advantages of their system over TRIX, and what is the total cost of its implementation?

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