



# NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

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## MBA PROFESSIONAL REPORT

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**An Analysis of the Factors Generating the  
Variance between the Budgeted and Actual  
Operating Results of the Naval Aviation  
Depot at North Island, California**

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**June 2008**

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**AN ANALYSIS OF THE FACTORS GENERATING THE VARIANCE  
BETWEEN THE BUDGETED AND ACTUAL OPERATING RESULTS OF THE  
NAVAL AVIATION DEPOT AT NORTH ISLAND, CALIFORNIA**

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Submitted in partial fulfillment of the requirements for the degree of

**MASTER OF BUSINESS ADMINISTRATION**

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For six of the past eight years, naval aviation depot-level maintenances activities have encountered operating losses that were not anticipated in the Navy Working Capital Fund (NWCF) budgets. These unanticipated losses resulted in increases or surcharges to the stabilized rates as an offset. This project conducts a variance analysis to uncover possible causes of the unanticipated losses. The variance analysis between budgeted (projected) and actual financial results was performed on financial data collected on the E-2C aircraft program from Fleet Readiness Center Southwest (FRCSW) located in San Diego, California. The results of the variance analysis are interpreted and discussed in terms of labor sales quantity, mix, and rate variances, material sales variance, material expense variance, labor, production overhead, and general & administrative rate/spending and quantity variances. The results of this project reveal the factors that created the greatest variance in FRCSW's net operating results. The variance analysis suggests that the factors having the greatest affect on the operating results were the material sales variances, material expense variances, and the variances due to the quantity of work. Additionally, the analysis revealed that during the year analyzed (FY 2007) FRCSW was not reimbursed for 21 percent of its material costs.

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# TABLE OF CONTENTS

<b>I.</b>	<b>INTRODUCTION.....</b>	<b>1</b>
<b>A.</b>	<b>PURPOSE OF THIS STUDY .....</b>	<b>1</b>
<b>B.</b>	<b>BACKGROUND .....</b>	<b>1</b>
<b>C.</b>	<b>RESEARCH QUESTIONS.....</b>	<b>1</b>
	<b>1. Primary Question.....</b>	<b>1</b>
	<b>2. Secondary Questions.....</b>	<b>1</b>
<b>D.</b>	<b>PROJECT SCOPE AND LIMITATIONS .....</b>	<b>2</b>
	<b>1. Scope.....</b>	<b>2</b>
	<b>2. Limitations to the Project.....</b>	<b>2</b>
<b>E.</b>	<b>RESEARCH METHOD .....</b>	<b>2</b>
<b>F.</b>	<b>CONTENT OF CHAPTERS .....</b>	<b>3</b>
<b>II.</b>	<b>NAVAL AVIATION DEPOTS AND WORKING CAPITAL FUNDS .....</b>	<b>5</b>
<b>A.</b>	<b>NAVAL AVIATION DEPOTS.....</b>	<b>5</b>
	<b>1. United States Code Title 10.....</b>	<b>5</b>
	<b>2. BRAC 2005 .....</b>	<b>6</b>
	<b>3. NADEP North Island.....</b>	<b>8</b>
<b>B.</b>	<b>DEFENSE FINANCIAL MANAGEMENT REGULATIONS.....</b>	<b>9</b>
<b>C.</b>	<b>NAVY WORKING CAPITAL FUND .....</b>	<b>9</b>
	<b>1. History.....</b>	<b>9</b>
	<b>2. Design.....</b>	<b>10</b>
	<b>3. Objectives.....</b>	<b>11</b>
	<i>a. Management.....</i>	<i>11</i>
	<i>b. Financial .....</i>	<i>13</i>
	<b>4. Operations .....</b>	<b>14</b>
	<b>5. Budget Formulation.....</b>	<b>14</b>
<b>D.</b>	<b>RATE SETTING.....</b>	<b>16</b>
	<b>1. Cost Elements .....</b>	<b>16</b>
	<b>2. Unit Cost Goal.....</b>	<b>17</b>
	<b>3. Recovery Rate.....</b>	<b>18</b>
<b>E.</b>	<b>SUMMARY .....</b>	<b>19</b>
<b>III.</b>	<b>DATA COLLECTION AND PROCESSING .....</b>	<b>21</b>
<b>A.</b>	<b>INTRODUCTION.....</b>	<b>21</b>
<b>B.</b>	<b>DATA GATHERING .....</b>	<b>21</b>
<b>C.</b>	<b>VARIANCE ANALYSIS.....</b>	<b>22</b>
	<b>1. Variance Analysis Definition .....</b>	<b>22</b>
	<b>2. Variance Analysis Process.....</b>	<b>23</b>
	<i>a. Labor Sales Variance.....</i>	<i>24</i>
	<i>b. Material Sales and Expense Variance .....</i>	<i>27</i>
	<i>c. Civilian Labor Expense Variance .....</i>	<i>28</i>
	<i>d. Contract Labor Expense Variance.....</i>	<i>29</i>
	<i>e. Production Overhead Expense Variance .....</i>	<i>32</i>

	<i>f.</i> General & Administrative Expense Variance.....	34
D.	SUMMARY .....	36
IV.	FINDINGS AND ANALYSIS .....	37
A.	INTRODUCTION.....	37
B.	RESULTS OF VARIANCE ANALYSIS .....	37
1.	Labor Sales Variance.....	37
2.	Material Sales Variance .....	38
3.	Material Expense Variance.....	39
4.	Rate & Spending Variance.....	39
5.	Quantity Variance.....	40
C.	SUMMARY .....	40
V.	CONCLUSION AND RECOMMENDATIONS.....	43
A.	INTRODUCTION.....	43
B.	PRIMARY QUESTION .....	43
1.	What are Factors Affecting the Operating Results at FRCSW?...43	
C.	SECONDARY QUESTIONS.....	44
1.	Is the Current Model Accurate at Predicting Workload Quantity? .....	44
2.	Is the Current Model Accurate at Predicting the Labor Rates? ...45	
3.	Is the Current Model Accurate at Predicting Overhead and G&A Rates?.....	45
4.	Where Should the Office of Budget (FMB), Commander FRCs (COMFRC), and FRCSW Invest Resources to Reduce the Size of Variances? .....	45
D.	RECOMMENDATIONS FOR FURTHER RESEARCH .....	46
E.	CONCLUSION .....	47
APPENDIX A.	UNITED STATES CODE TITLE 10 HIGHLIGHTS.....	49
APPENDIX B.	BASE CLOSURE AND REALIGNMENT REPORT - FRC SUMMARY .....	55
APPENDIX C.	FRC SOUTHWEST ORGANIZATIONAL CHART.....	59
APPENDIX D.	DEFENSE WORKING CAPITAL FUND BUSINESS AREAS ...	61
APPENDIX E.	REVOLVING FUND CASH FLOW .....	63
APPENDIX F.	REPRESENTATIVE RAW DATA.....	65
	LIST OF REFERENCES.....	69
	INITIAL DISTRIBUTION LIST .....	71

## LIST OF FIGURES

Figure 1.	Naval Aviation Enterprise (NAE) Fleet Readiness Centers (From Johns, 2006) .....	7
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## LIST OF TABLES

Table 1.	FRCSW, E-2C, Variances by Line Item.....	24
Table 2.	FRCSW, E-2C, 2007 Labor Sales Variances.....	26
Table 3.	FRCSW, E-2C, 2007 Material Sales Variances.....	27
Table 4.	FRCSW, E-2C, Civilian Labor Rate Variance .....	28
Table 5.	FRCSW, E-2C, Civilian Labor Quantity Variance.....	29
Table 6.	FRCSW, E-2C, Contract Labor Rate Variance .....	30
Table 7.	FRCSW, E-2C, Contract Labor Quantity Variance.....	31
Table 8.	FRCSW, E-2C, Production Overhead Spending Variance.....	32
Table 9.	FRCSW, E-2C, Production Overhead Quantity Variance .....	33
Table 10.	FRCSW, E-2C, General and Administrative Spending Variance.....	35
Table 11.	FRCSW, E-2C, General and Administrative Quantity Variance.....	35
Table 12.	FRCSW, E-2C, 2007 Labor Sales Variances.....	38
Table 13.	FRCSW, E-2C, 2007 Material Sales Variances.....	38
Table 14.	FRCSW, E-2C, Material Expense Variance .....	39
Table 15.	FRCSW, E-2C, Expense Rate & Spending Variance .....	40
Table 16.	FRCSW, E-2C, Expense Quantity Variance.....	40

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# **I. INTRODUCTION**

## **A. PURPOSE OF THIS STUDY**

The purpose of this project is to identify the factors that have the most influence on the differences between the budgeted and actual operating results for Fleet Readiness Center, Southwest's (FRCSW) depot-level aviation maintenance activity. Since all the Navy's aviation depot-level activities operate in the same environment and face similar challenges, it is conceivable that the factors generating differences at FRCSW are similar to the factors generating differences at the other two Naval Aviation depot-level maintenance activities.

## **B. BACKGROUND**

Accurately predicting depot-level maintenance is difficult and includes a myriad of variables that increase the complexity of the task. Over six of the past eight years, the Naval Aviation depot-level maintenance activities have encountered operating losses that were not anticipated in the Navy Working Capital Fund (NWCF) budgets. As a result an increase, or surcharge, to the aviation depot-level maintenance NWCF stabilized rates was required to offset the operating losses. Identifying possible causes of variances between the budgeted and actual financial operating results could provide a better understanding of why operating losses have occurred.

## **C. RESEARCH QUESTIONS**

### **1. Primary Question**

What are the factors affecting the operating results at FRCSW?

### **2. Secondary Questions**

- Is the current model accurate at predicting workload quantity?
- Is the current model accurate at predicting the labor rates?

- Is the current model accurate at predicting overhead and G&A rates?
- Where should the Office of Budget (FMB), Commander FRCs (COMFRC), and FRCSW invest resources to reduce the size of variances?

## **D. PROJECT SCOPE AND LIMITATIONS**

### **1. Scope**

This project completes a variance analysis on the expense and revenue data obtained from FRCSW's depot-level maintenance activity. The data collected for this project were on the E-2C Hawkeye program. This program was chosen because all work done on the E-2C aircraft at FRCSW was at a fixed price and provided a manageable sample size to complete the in-depth variance analysis.

### **2. Limitations to the Project**

This project is limited to the data on the E-2C airframe. The E-2C program provided homogeneous data to complete the in-depth variance analysis. The original intent of this project was to complete a variance analysis on all type/model/series depot-level work completed at FRCSW. Due to time constraints and the need for homogeneous data only one type/model/series, the E-2C, was analyzed. As a result of limited sales data, fiscal year (FY) 2007 was the only year that a full variance analysis was completed. A variance analysis on expenses was performed for FY2004 through FY2006. Additionally, due to limited data on material expenses and sales, an expense quantity and mix analysis and a sales quantity and rate variance was not conducted.

## **E. RESEARCH METHOD**

The research method utilized for this project consisted of a literature review, interviews with FRCSW employees, analysis of historical data, and site visits to FRCSW. The literature review included DoD regulations, DoD reports, briefs, textbooks, and thesis work conducted by previous Naval Postgraduate School students.

During the two site visits to FRCSW, interviews were conducted with the FRCSW Commanding Officer, the Plant General Manager for Production, the E-2C Aircraft Product Manager, the Comptroller, and analysts on the Comptroller's Staff. These interviews revealed possible causes of the variances between the budgeted and actual financial results. These interviews also provided background information for NWCF activities and, in particular, FRCSW operations. Follow-on electronic and telephonic correspondence was essential in answering questions and clarifying the data.

A variance analysis of historical financial data was done for four fiscal years (FY 2004, 2005, 2006, and 2007) on the budgeted expenses and expenses that were actually incurred. A variance analysis on the sales data was completed for FY2007 only. The data used in this analysis were primarily collected from the FRCSW Accounting and Financial Information System (AFIS). Some data not maintained in the AFIS database were derived from other financial reports during the site visits.

## **F. CONTENT OF CHAPTERS**

Chapter II, titled "Naval Aviation Depots and Working Capital Funds" introduces the legislation that established and provides legal guidance for aviation depot-level maintenance organizations, also known as Fleet Readiness Centers, and acknowledges the applicable defense financial management regulations. This chapter also discusses the history of Navy Working Capital funded (NWCF) activities and the operations of a NWCF activity as designed.

Chapter III, titled "Data Collection and Processing" defines variance analysis and explains the process used to determine the variances. The focus of this chapter is to present the variance analysis process performed on the financial data collected from FRCSW.

Chapter IV, titled "Findings and Analysis" summarizes and interprets the results of the analysis described and conducted in Chapter III. The results are discussed in terms of labor sales variance, material sales variance, material expense variance, rate and spending variances, and quantity variances. This chapter also indicates the factors that created the greatest variance in this analysis.

Chapter V, titled “Conclusion and Recommendations” wraps up the project by answering the primary and secondary research questions. This chapter also provides recommendations for further research.

## **II. NAVAL AVIATION DEPOTS AND WORKING CAPITAL FUNDS**

The purpose of this chapter is to introduce the reader to the legislation that established and provides legal guidance for aviation depot-level maintenance organizations (Fleet Readiness Centers), and to acknowledge the applicable Defense Financial Management Regulations. It also discusses the history and operations of Navy Working Capital funded activities and how they set their rates.

### **A. NAVAL AVIATION DEPOTS**

#### **1. United States Code Title 10**

Title 10 of the U.S. Code provides the legislative foundation for depot-level maintenance and the use of working capital funds for industrial type activities. The section of Subtitle A, Part IV from Chapter 148 sets the requirement for depot-level maintenance activities within DoD. Sections, 2460-2464, 2466-2467, 2469-2472 and 2474-2475, from Chapter 146, provide the majority of legislation for depot-level maintenance activities.

The sections from Chapter 146:

- define depot-level maintenance
- establish the scope of work
- establish the studies and reports requirements
- encourage public-private competition
- establish the requirements for converting to and from a contracting workforce
- establish the requirement to maintain core logistics capabilities
- limit the amount of depot maintenance that can be contracted to private industry
- set the standard for managing DoD civilian employees
- allow depot-level maintenance activities to compete for other Federal Agency work

- authorize the Secretary of Defense (SECDEF) to designate Centers of Industrial and Technical Excellence

Section 2563, Chapter 152 allows depot maintenance activities to perform work for private industry. Section 2687, Chapter 159 discusses base closures and realignments and section 2208, Chapter 131 discusses working capital funds.

Title 10 provides legal justification, restrictions, opportunities, and requirements of the military depot-level maintenance industry. Appendix A further discusses each aforementioned section (Title 10).

By providing the Armed Forces with a critical capacity to respond to the needs of the Armed Forces for depot-level maintenance and repair of weapon systems and equipment, the depot-level maintenance and repair activities of the Department of Defense play an essential role in maintaining the readiness of the Armed Forces (Section 331 of Pub. L. 103-337, Title 10).

## **2. BRAC 2005**

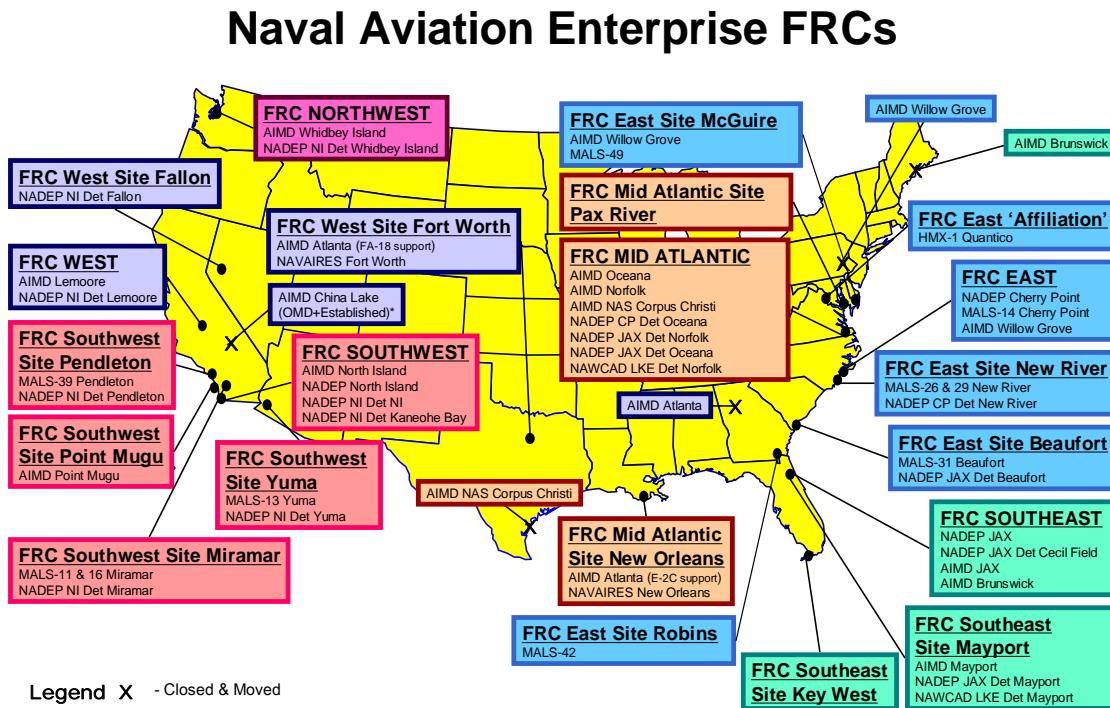
There have been five Base Realignment and Closure (BRAC) rounds (in 1988, 1991, 1993, 1995 and 2005). However, the BRAC 2005 was the driving force behind reorganizing and restructuring Naval Aviation Maintenance into what it is today.

A comprehensive assessment in support of BRAC decisions revealed that the DoD maintained a 24 percent excess capacity in installations to support the future forces (Department of Defense [DoD], 2005). In his initial guidance to the DoD, then Secretary of Defense (SECDEF) Donald Rumsfeld directed the DoD leaders to “reconfigure our current infrastructure into one which maximizes *both* war fighting capability and efficiency” (DoD, 2005). As a result, five themes were developed:

1. Support force transformation
2. Rebase forces to address new threat, strategy, and force protection concerns
3. Consolidate business-oriented support functions
4. Promote joint and multi-Service basing
5. Achieve savings (DoD, 2005)

The two themes that are directly supported by the Naval Aviation Enterprise (NAE) are to “consolidate business-oriented support functions” and to “achieve savings” through restructuring support functions and reduction of support personnel, land, and facilities (DoD, 2005). The NAE objectives of reducing the number of maintenance levels by integrating the depot-level maintenance and intermediate level-maintenance, and moving the integrated maintenance closer to the most populated fleet areas, support the BRAC themes.

BRAC 2005 reorganization and restructuring of depot-level and intermediate-level maintenance activities proposed the creation of six Fleet Readiness Centers (FRC) and 13 satellite FRC sites. In essence, major intermediate and depot-level repair facilities were merged into FRCs (DoD, 2005). Appendix B shows a detailed list of the recommendations.



Source: Johns, 2006

Figure 1. Naval Aviation Enterprise (NAE) Fleet Readiness Centers (From Johns, 2006)

BRAC 2005 disestablished Naval Aviation Depot (NADEP) North Island and the Aviation Intermediate Maintenance Department (AIMD) entities at North Island, and realigned these functions under FRC Southwest. Figure 1 is the Naval Aviation Enterprise FRC layout as of April 2006 (Johns, 2006). As depicted in this figure, the concentrations of maintenance activities are located where the Navy's aviation assets are concentrated.

### **3. NADEP North Island**

The depot-level maintenance functions of FRC Southwest are nearly as old as Naval Aviation itself. In 1919, nine years after the start of Naval Aviation, the FRC began work as an Assembly and Repair Department of the Naval Air Station at North Island. In 1969, the Assembly and Repair Department was renamed the Naval Air Rework Facility (NARF). By 1987, the NARF was renamed the Naval Aviation Depot (NADEP) North Island (Best Manufacturing Practices, 2003). As a result of BRAC 2005, NADEP North Island was disestablished and realigned into FRC Southwest.

Recognized as an innovator in depot-level maintenance by the Office of Naval Research's Best Manufacturing Practices program, FRC Southwest is the Navy's primary west coast aircraft repair and modification facility for mission essential fighter and rotary wing aircraft for Navy and Marine Corps squadrons (Best Manufacturing Practices, 2003). As of December 2007, FRC Southwest employed 4,371 people consisting of 3,494 civilian employees and 877 military personnel (M. Kelly, Personal Communication, December 14, 2007). The mission of the Fleet Readiness Center Southwest is:

...CNAF's [Commander Naval Air Forces] West Coast Aircraft repair D2I [Depot to Intermediate] facility specializing in the support of Navy and Marine Corps aircraft and related systems. Through partnerships with industry, other government agencies and supporting aerospace organizations, FRC Southwest, North Island repairs and overhauls aviation systems" (Fleet Readiness Center, Southwest [FRCSW], 2007).

This FRC performs repair and modification work on F/A-18 Hornets and Super Hornets, EA-6B Prowlers, S-3 Vikings, E-2 Hawkeyes, C-2 Greyhounds, AV-8B



Harriers, SH-60 Seahawks and HH/MH-60s, AH-1 Cobras, UH/HH-1 Hueys, and CH-53 Sea Stallions. Additionally, FRC Southwest deploys Field Service Teams and Voyager Repair Teams to deployed aviation squadrons, ships, and installations worldwide. The Field Service and Voyager Repair Teams provide depot-level maintenance repair and modification for aircraft, aviation structures, aircraft components, aircraft carrier catapult and arresting gear systems, and aviation equipment and facilities on other ships (FRCSW, 2007). In 2007, FRC Southwest deployed over 2,500 Field Service and Voyager Repair Teams, repaired and modified approximately 285 aircraft, and manufactured over 50,000 aircraft components (M. Kelly, Personal Communication, December 14, 2007). Appendix C displays the organizational structure of FRC Southwest as of December 2007.

## **B. DEFENSE FINANCIAL MANAGEMENT REGULATIONS**

The Department of Defense Financial Management Regulations (FMR), DoD 7000.14-R, is the guiding document that provides policy, regulations, and procedures for DoD activities. This regulation is issued by the Under Secretary of Defense (Comptroller). The most applicable of the fifteen volumes for Navy Working Capital Fund (NWCF) activities is Volume 11B, titled Reimbursable Operations, Policy and Procedures-Working Capital Funds (WCF). Specifically, Volume 11B provides the financial management mandates, systems, and functions for the WCF activities (Department of Defense [DoD], 2008).

## **C. NAVY WORKING CAPITAL FUND**

### **1. History**

Revolving funds were authorized for use by DoD as a result of the National Security Act Amendment of 1949. A revolving fund activity is an organization that obtains all its income from the operations it performs. The organization is able to finance continuing operations without the limits of fiscal year constraints which normally constrain government financed organizations (Potvin, 2007).

Historically, the military has used two types of revolving funds:

1. Stock Funds are used to make volume purchases of spare parts and other goods from commercial sources. These goods are then kept in inventory until they are sold to operating forces at the price the stock fund purchased the goods plus a surcharge (Office of the Secretary of Defense, (Comptroller) [OSD(C)], 2007).
2. Industrial Funds are used to provide the operating forces with industrial and commercial goods and services, such as depot-level maintenance. The price charged for industrial and commercial goods and services to the operating forces includes overhead costs and material costs (OSD(C), 2007).

In 1991, all of the Services' stock and industrial funds were rolled into a single revolving fund called the Defense Business Operations Fund (DBOF). The intent of the DBOF was to share funds across all services; however, it failed. The reason it failed was because it assumed that one large revolving fund would require a smaller cash reserve than many smaller revolving funds. Since the working capital of the DBOF was less than the sum of all the revolving funds it replaced, each service experienced severe cash shortages (Potvin, 2007).

Over the period 1996 to 1999, the DBOF was reorganized into five Defense Working Capital Funds —Army, Navy (NWCF), Air Force, Defense Wide, and Defense Commissary Agency. These funds are now the responsibility of their respective agencies and must maintain a positive cash balance or be in violation of the Antideficiency Act (Potvin, 2007).

## **2. Design**

The Defense Working Capital Fund (DWCF) operations are now organized as business areas (such as Depot Maintenance). A business area is a collection of activities (such as depot-level maintenance at FRC Southwest) that provides goods and services to other organizations either within DoD or to non-DoD organizations as authorized by USC Title 10 (OSD(C), 2007).

DWCF business operations include:

- Consumable spare parts and supplies
- Depot maintenance
- Storage and transportation of supplies and secondary equipment items
- Financial and accounting services
- Printing and publication services
- Commissaries
- Information services
- Research and development (OSD(C), 2007)

To become a DWCF business area, an activity must meet four criteria:

1. Produce identifiable goods and services
2. Have an approved accounting system
3. Have customers that need and order products or services
4. Have evaluated the advantages and disadvantages of establishing a buyer/seller relationship (OSD(C), 2007)

Should a service component wish to establish a new business area, it must meet the above criteria and propose the new business area to the Office of the Under Secretary of Defense, (Comptroller) (Potvin, 2007). Appendix D includes a list of business areas, detailing functions and customers.

### **3. Objectives**

#### ***a. Management***

DWCFs or, in the case of this project, NWCFs, attempt to provide total cost visibility through the use of accounting tools, such as activity based costing, to achieve full cost recovery. Managers are responsible to customers to meet customer needs while at the same time operating within budget cost goals (OSD(C), 2007).

By establishing clear customer/provider relationships, adopting private-sector techniques for resource management, consolidating functions, and using activity-based accounting policies to display full costs, the working capital fund system provides managers with improved cost and performance data for more effective and efficient decision making (OSD(C), 2007).

The NWCF financial management structure employs free-market system principles and encourages business-like processes that are mission driven. Since no operating funds are provided by Congress, a NWCF activity must collect a fee for the work it performs to sustain itself. This is different than a mission funded organization that is funded by Congress and is driven to do the most it can while expending all the funds provided (OSD(C), 2007).

Some of the advantages of using a NWCF include:

- Identifies the total or 'true' cost of DoD goods and services to Congress, military users (buyers), and those who provide goods and services (sellers)
- Promotes more efficient and effective allocation and use of resources
- Underlines the cost consequences of choices and allows purchases to be made in anticipation of future funded orders
- Provides managers with the financial authority and flexibility to procure and use manpower, materials, and other resources more effectively
- Improves cost estimates and cost control through comparison of estimates and actual costs
- Places customers in the position of critically evaluating purchase prices and the quality of goods and services ordered
- Allows for greater flexibility and security in decision making as there are no fiscal year limitations
- Establishes standard prices or stabilized rates and unit prices for goods and services furnished by NWCF Business Areas, enabling customers to plan and budget more confidently (OSD(C), 2007)

***b. Financial***

Unlike a mission funded activity, whose mission is to do the most it can with funds provided in appropriations, the objective of the NWCF is to achieve a break-even operating result over time. This means that the NWCF activity should neither make a profit nor incur a loss. If a profit or a loss were to occur the NWCF activity will either lower or raise prices to make up for the previous year's operating results (OSD(C), 2007).

NWCF activities recover the cost of operations through the stabilized rates that they charge to their customers. These rates include direct costs (i.e., labor, parts, and material), indirect costs (e.g., supervisors), general and administrative costs (e.g., executive staff costs), any gains or losses from prior years, and possible surcharges. The focus of a NWCF activity is not to save the Navy money; its focus is on recovering the total cost of operations (OSD(C), 2007). NWCF activities make financial sense because a NWCF:

- Provides for total-cost visibility and improved cost awareness
- Enables full-cost recovery (capital costs cannot be exceeded and money is saved for additional programming)
- Stabilizes rates to protect customers from inflation during program execution
- Gives managers more flexibility because they know the true cost of decisions
- Shifts the focus from spending to cost and cash management
- Minimizes costs because customers determine what they need and can justify their decisions and funding allocation
- Measures performance and promotes greater taxpayer accountability
- Allows for greater flexibility and security in decision-making, as there are no fiscal year limitations (OSD(C), 2007)

As indicated by the list above, a NWCF activity emphasizes accountability, financial flexibility, and finding reliable ways to measure the total cost of delivering a good or service.

#### **4. Operations**

The NWCF activity is a revolving fund structure that is designed to provide goods and services to the operational forces. The revolving fund concept gets its name from the circular flow of cash into and out of the fund (OSD(C), 2007).

The steps of the revolving cash flow are:

1. Customers justify their program requirements. Congress approves and the President signs into law the annual budget for the customers (e.g., navy stations, air wings, ships, and agencies). Finally, customers receive appropriated funds.
2. The “funded” customers send their orders to the NWCF business area activity. An order is generally in the form of a fixed-priced contract, based upon the stabilized rate for the goods or services to be provided.
3. The provider incurs costs in the course of providing the customer with the contracted goods or services. The provider submits an invoice to the customer and receives payment.
4. This cycle continues for the life of the NWCF business activity (OSD(C), 2007).

Appendix E shows a graphical representation of the revolving flow. This cycle operates like a commercial business; however, the financial goals of a revolving fund (or NWCF) differ in that the NWCF seeks a zero net profit.

#### **5. Budget Formulation**

When NWCF business areas are established, funds are transferred from an existing appropriation account into the NWCF. This initial working capital (commonly known as capital investment in the commercial sector) is called the “corpus.” This corpus is used to finance the initial cost of goods and services needed to provide the contractually agreed upon goods and services to their customers (OSD(C), 2007).

The corpus and the subsequent revolving funds in the working capital fund are known as “no year” funds and remain available across fiscal years with no time

limitation. In contrast, the appropriated funds provided to mission funded activities have a finite period of time in which they must be used (OSD(C), 2007).

In order for a NWCF activity to operate effectively, it must be able to budget for all of its activities and cover the cost of its operations. The central principle to remember with NWCF activities is the customer-provider relationship. This means that if the customer does not think the product meets cost or performance needs it can go to another provider. However, the depot-level maintenance activity is somewhat protected by Section 2466 of Title 10, which limits the amount of mission funded Depot level work that could be outsourced to private industry to 50 percent. Nonetheless, there are negotiations between the customer and provider as well as the Office of Budget (FMB), which oversees the financial operations of all Navy activities, including the NWCF.

NWCF budgets are based on estimated costs and workloads nearly two years in advance of when the work actually occurs. This creates some level of error in the budget of the NWCF (Potvin, 2007). Estimated costs are used to calculate rates, called stabilized rates (to be discussed later).

There are two budgets formulated simultaneously within the NWCF activity: the operating budget and the capital budget. The operating budget covers annual operating costs which are made up of all direct, indirect, and general & administrative (G&A) costs, and depreciation expenses (except for military construction). The capital budget covers the activity's annual capital asset investment that includes items such as industrial equipment, minor construction, telecommunications equipment, IT infrastructure, and software, but does not include military construction projects. These two budgets are combined to create the Annual Operating Budget (AOB) (Potvin, 2007).

The AOB, issued prior to the beginning of the fiscal year, provides the activity's throughput estimate, the unit cost goal, and desired Net Operating Result (NOR). The NOR equals the annual revenue minus the annual costs. Adjustments to AOBs are made during the execution year to account for changes in capital investment, costs, and

workload (Potvin, 2007). Adjustments to AOBs due to capital investment are not that common. The majority of the adjustments are due to changes in workload mix (D. Delgado, personal communication, March 18, 2008).

The budget process is the mechanism that ensures the Navy customers (mission funded) are resourced to pay the established NWCF rates. Once the NWCF activities' budgets are completed they are forwarded to the Assistant Secretary of the Navy (Financial Management and Comptroller) (ASN (FM&C)) for review (Potvin, 2007). If the NWCF activity's submission shows a "significant increase" from the previous year's submission, the NWCF activity will be asked to explain the reason for the "significant increase." If the activity's reason is not accepted, an adjustment to the submission will be made, making sure that the NWCF submission matches the mission funded activity's funding level. If the reason is accepted, an adjustment to the mission funded activity's budget will occur, ensuring balance. For example, in the FY 2009 Program/Budget Review, an issue was submitted as a result of a significant increase in NWCF direct labor and direct material costs from the FY 2008 President's Budget (Roth, 2007). ASN (FM&C)'s goal is to balance the mission funded budgets with the NWCF budgets. Once complete, the NWCF budget is sent to USD(C) as part of the annual Budget Estimate Submission (BES) (Potvin, 2007).

#### **D. RATE SETTING**

Depot rates are based on the unit cost goal, which is adjusted for the depot's Accumulated Operating Results (AOR) and further adjusted by the depot activity group and/or Navy Working Capital Fund Comptroller to achieve zero Navy Working Capital Fund AOR.

##### **1. Cost Elements**

In order to understand the Navy Working Capital Funds (NWCF) and the rate setting process, one must understand its cost elements and how the costs are allocated. Some of these cost elements will be considered fixed costs and some will be considered variable costs. Fixed costs are costs that do not change with changes in the organizations



activity, such as building maintenance. Variable costs are costs that change with changes in activity, such as direct labor hours. These cost elements make up the estimate used for total cost.

- Direct costs are costs that can be directly tied to the product or service. An example would be the amount of time (i.e., direct labor hours) a mechanic works on an aircraft engine. Direct costs are traced to the product that they are tied to.
- Indirect costs are costs that cannot economically be traced to the end product or service. These types of costs can include both labor and materials. An example of indirect labor would be a supervisor who supervises multiple production centers and cannot reasonably trace his time to any particular job. Indirect materials are materials that are consumed in producing the end product or service, but for which it is not economical to track the amount on an individual unit of output basis. A common method used in allocating indirect costs is to allocate costs based on direct labor hours.
- General & Administrative (G&A) costs are costs that do not contribute directly to producing goods or providing services, but to the overall operation of the activity. These include costs such as utilities, office supplies, housekeeping, and administrative salaries. These costs are allocated across all goods and services produced. A common method used in allocating G&A costs is to allocate costs based on direct labor hours.

While some of these costs are typically considered fixed, it is important to remember that over the long run all costs are variable (Potvin, 2007).

## **2. Unit Cost Goal**

NWCFs use the unit cost goal (UCG) for planning purposes. The UCG is an estimate of what a unit of product or service “should cost.” The unit cost goal is calculated by dividing the planned total cost by the planned output. Output could be measured several ways including direct labor hours, dollars of sales, or units shipped (Potvin, 2007).

$$\text{Unit Cost Goal} = \text{Planned Total Cost} / \text{Planned Output}$$

The unit cost goal can be used as the genesis for setting the recovery rate and as a measure against which to compare actual costs (Potvin, 2007). In the case of FRCSW, planned output is measured in direct labor hours.

### 3. Recovery Rate

The process for establishing recovery rates begins approximately two years before the fiscal year in which they will go into effect. In this project, recovery rate is synonymous with stabilized rate and sales rate. These rates are set during the budget process and are proposed in the Navy's Budget Estimate Submissions (BES), approved by the Office of the Under Secretary of Defense (Comptroller) (OUSDC), and documented in a Program Budget Decision (PBD). NWCF rates/prices are set by the depot business activity at a level estimated to recover the full cost of providing goods or services and to achieve a zero AOR (Potvin, 2007).

Using aviation depot-level maintenance as an example, the rate setting is an incremental process which starts building from the individual work center level to the depot-level activity and continues to build up to the depot activity group and ultimately the Comptroller. For an aviation depot, the first estimate in computing the rate is the total direct labor hours (DLH) needed to accomplish the projected throughput for the depot in that fiscal year. It begins with determining the workload standard by calculating the required DLHs to complete the work for the individual tasks that are going to be performed and then multiplying by the number of times that those tasks will be performed. The number of tasks and the types of tasks to be performed are calculated through negotiations with the customer. This calculation will provide the total estimated DLHs of work to be performed in the fiscal year (Potvin, 2007).

After calculating the DLHs, the total costs (i.e., direct, indirect, and G&A costs) are estimated and referred to as the "cost goal." The cost goal is then adjusted for the AOR. If the AOR is positive, which means an accumulated profit, the AOR would be subtracted from the cost goal. Conversely, a negative AOR would result in an addition to the cost goal. This adjusted cost goal is divided by the estimated DLHs and equals the initial recovery rate also known as Unit Cost Goal (Potvin, 2007).

$$\text{Initial Recovery Rate} = \text{Unit Cost Goal} = \frac{\text{Cost Goal} \pm \text{AOR} + \text{Other}}{\text{DLHs}}$$

Rates are then passed up to the depot activity group level, which oversees several depot activities. The depot activity group may adjust one depot's rate in order to make up for a planned loss at another depot. This would have the effect of one depot subsidizing another. This is appropriate as long as the NWCF as a whole is working toward a zero AOR (Potvin, 2007).

Once established, recovery rates are held constant for the duration of the applicable fiscal year. This protects appropriated fund customers with a "stabilized rate." This reduces disruptions in the customers' budgets as well as planned NWCF workload levels (Potvin, 2007).

## **E. SUMMARY**

This chapter introduced the legislative foundation that established and governs depot-level maintenance activities. Next, it discussed the aviation depot-level maintenance organization (Fleet Readiness Centers) established as a result of BRAC 2005. This chapter explained the new organizational structure and the history of aviation maintenance at FRC Southwest and acknowledged the financial regulations that govern the operating policies and procedures for Navy Working Capital Fund activities. Finally, this chapter covered the history of the Navy Working Capital Fund and the rate setting process, which is important in understanding the factors generating the variances between the budgeted and actual operating results. Chapter III analyzes the financial results from FRC Southwest's depot-level maintenance of the E-2C Hawkeye repair and overhaul work.

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### **III. DATA COLLECTION AND PROCESSING**

#### **A. INTRODUCTION**

This project examines the financial results of the maintenance work conducted on the E-2C Hawkeye aircraft at FRCSW. The methods of data collection were interviews with FRCSW employees and review of financial reports from FRCSW databases. A variance analysis was performed that examined some of the potential causes of variance from budgeted to actual operating results.

Since the depot's billing rates are designed to recover the input costs, as explained in Chapter II, it is important for the depot to be able to budget accurately for the costs it will incur in its operations. If the budgeted expenses, which are used to generate the billing rate, match the corresponding actual expense line item, then the depot will have accomplished its goal of breaking even. A variance analysis displays the differences between the budgeted and actual results.

#### **B. DATA GATHERING**

Interviews with FRCSW employees provided insight into the perceived factors generating the differences between budgeted and actual operating results in FRCSW and how the budgeting process worked. The most common comment by the interviewees was that the quantity of work (number of aircraft needing work) being performed was much different than the quantity of work planned for in the President's budget. Additional feedback from interviewees included comments about how the independence of FRCSW, as a working capital fund activity, has been eroded somewhat by the Navy's budget process to ensure that mission funded customer activities can afford the work. An example given was the price changes for materials. When material prices for FRCSW increased significantly, FRCSW was only permitted to increase the price it charges to customers at the same rate as an inflation index. The result was that FRCSW did not recover the full cost of materials used as intended by the working capital fund design.

FRCSW provided historical data for fiscal years 2004 to 2007 from its Accounting & Financial Information System (AFIS) database. These data included both the budgeted and actual results. The data consisted of reports with period costs broken out into six expense categories: labor expense, contract labor expense, material expense, production overhead expense, G&A expense, and other expense. The reports also detailed the budgeted and actual hourly expense or application rates for labor, contract labor, production overhead, and G&A. Included in the data were the budgeted direct labor hours and the actual direct labor hours worked. Refer to Appendix F for a representative example of the data received from FRCSW.

Initially, it was intended to analyze data from fiscal year 2000 through fiscal year 2007; however, data were not available earlier than fiscal year 2004, the year that the AFIS database was implemented. Although four years of data provided a trend in cost variances, a larger sample would have provided a better representation of trends.

Detailed sales data were not available for the years prior to 2007, the year in which a new data collection system was implemented. As a result of the lack of sales data, there is no trend in sales variance discussed in later chapters.

## **C. VARIANCE ANALYSIS**

To gather insight into the most influential factors on FRCSW's net operating result, a variance analysis was conducted on the E-2C product revenues and expenses. A variance analysis measures the actual results against a benchmark for what was expected to occur. The benchmark in this project is the E-2C operating results from the President's Budget for the given fiscal year, also referred to as the budgeted operating results.

### **1. Variance Analysis Definition**

An organization's budget is its plan of action, expressed in dollars, for a given period of time. Any difference between this benchmark and the actual results is a variance. A variance can be the result of numerous factors including: changes in operational quantity of work, the price of inputs, or operating efficiencies. This project conducts revenue and cost variance analyses.

Revenue or sales variances are typically computed for changes in sales price, sales quantity, and sales mix (Horngren, Foster, & Datar, 1994). Cost or expense variances are typically computed for both the price and quantity elements of items such as direct labor expense, direct materials expense, and overhead expense (Garrison, Noreen, & Brewer, 2006). The titles of the variances can vary depending on which variable is being examined. A price variance for labor is often referred to as a “labor rate variance” and a price variance for overhead is often referred to as an “overhead spending variance” (Garrison et al., 2006). For the purposes of this project, labor price variance will be referred to as “labor rate variance,” production overhead will be referred to as “production overhead spending variance,” and G&A will be referred to as “G&A spending variance.”

Additionally, a quantity variance is often referred to as an “efficiency variance” or “quantity variance” (Garrison et al., 2006). For the purposes of this study, “labor quantity variance” will be referred to as “labor quantity variance;” production overhead will be referred to as “production overhead quantity variance,” and G&A “quantity variance” will be referred to as “G&A quantity variance.”

## **2. Variance Analysis Process**

A variance analysis was conducted comparing the total budgeted sales and expenses by line item to the total actual sales and expenses by line item to get a sense of the overall variance picture. The amounts for 2007 are shown in Table 1.

Sales figures for FRCSW consist of direct labor hours and direct material sold to customers. The direct labor hours were broken down into sales quantity (total number of direct labor hours), sales mix (types of work), and sales price (stabilized rate). Since direct material sales are intended to reimburse FRCSW for the cost of materials used and quantity/mix data were not available, direct material sales were compared with direct material expenses.

Table 1. FRCSW, E-2C, Variances by Line Item

<b>2007</b>			
	Budget	Actual	Variance
Sales			
Labor	\$ 4,858,275	\$ 8,783,594	\$ 3,925,318
Material	\$ 7,348,653	\$ 14,082,916	\$ 6,734,264
Total Sales	\$ 12,206,928	\$ 22,866,510	\$ 10,659,582
Expenses			
Material	\$ 7,202,189	\$ 17,773,366	\$ (10,571,177)
Labor	\$ 1,791,437	\$ 3,659,228	\$ (1,867,791)
Contractor	\$ 266,379	\$ 321,545	\$ (55,166)
POH	\$ 2,152,877	\$ 4,338,311	\$ (2,185,434)
G&A	\$ 942,574	\$ 1,586,596	\$ (644,022)
Other	\$ -	\$ 205,931	\$ (205,931)
Total Expenses	\$ 12,355,456	\$ 27,884,977	\$ (15,529,521)
Net Income/(Loss)	\$ (148,528)	\$ (5,018,467)	\$ (4,869,939)

All expense variances are broken down into their respective spending and quantity components. The formula approach was used in completing the variance analysis for civilian labor, contract labor, production overhead, and G&A expenses. A formula approach isolates individual variables that cause variances within an organization by utilizing mathematical equations. A different equation is used for each variable. Further analysis was not performed on the other-expense category because there was not a budget for other expenses. The discussion of the detailed variance analysis for revenue and the expenses (i.e., direct material, civilian labor, contract labor, production overhead, and G&A) follow.

*a. Labor Sales Variance*

Labor sales variances were broken down and attributed to three factors: labor sales quantity, labor sales mix, and labor sales price. A different formula was used to calculate each of these variances.

1) Labor Sales Quantity Variance: The labor sales quantity variance can be attributed to deviations in the total amount of sales from the budgeted



average hourly wages (budget average rate) paid for direct labor government workers. The formula used to accomplish the analysis can be expressed as follows:

$\text{Labor Sales Quantity Variance} = (\text{AQ} - \text{BQ}) \times \text{BAR}$ <p>AQ = Actual Quantity BQ = Budget Quantity BAR = Budget Average Rate</p>
---

The actual labor quantity is the number of direct labor hours that FRCSW billed customers for the work performed. The budget labor quantity is the projected number of direct labor hours for sale. The budget average labor rate is the stabilized rate used in the budget to calculate the sales dollars for labor billed. The results of the calculations are presented in Table 2. Table 2 shows the labor sales quantity variance, labor sales mix variance, and labor sales rate variance. The sum of the three variances is the total variance for sales.

A negative or unfavorable labor sales quantity variance indicates that the quantity of sales, as measured in hours, was lower than anticipated in the budget. Conversely, a positive or favorable labor sales quantity variance indicates that the sales quantity, as measured in hours, was higher than anticipated in the budget.

2) Labor Sales Rate Variance: The labor sales rate variance can be attributed to changes in the sales price charged to customers. The formula used to accomplish the analysis can be expressed as follows:

$\text{Labor Sales Rate Variance} = \text{AQ} \times (\text{AR} - \text{BR})$ <p>AR = Actual Rate BR = Budget Rate</p>
--

The actual rate is the stabilized rate, or recovery rate used for actual sales. The budget rate is the stabilized rate used in the budget formulation for sales. Actual quantity of work consists of the work that was started in the previous fiscal year (carry-in) and work started in the current fiscal year (current year). An additional calculation is required because the carry-in and current year work are sold at different rates. The results of the calculations are depicted in Table 2.

A negative, or unfavorable, labor sales rate variance indicates that the change in sales rate reduced the total sales dollars. Conversely, a positive or favorable sales rate variance indicates that the change in sales rate increased the total sales dollars. For FRCSW this variance is zero because FRCSW uses the same rate for both the budget and actual operations.

Table 2. FRCSW, E-2C, 2007 Labor Sales Variances

<b>Labor Sales Quantity Variance</b>						
(Actual Quantity (hours))	-	Budget Quantity (hours))	x	Budget Average Rate	=	Quantity Variance
106,002	-	56,873)	x	\$85.42	=	\$4,196,758
<b>Labor Sales Rate Variance</b>						
Actual Quantity (hours)	x	(Actual Rate	-	Budget Rate)	=	Rate Variance
Carry-In Work 46,691	x	(\$78.28	-	\$78.28)	=	\$0.00
Current Year Work 59,311	x	(\$86.47	-	\$86.47)	=	\$0.00
						Rate Variance
						\$0.00
<b>Labor Sales Mix Variance</b>						
(Actual Average Rate	-	Budget Average Rate)	x	Actual Quantity (hours)	=	Mix Variance
(\$82.86	-	\$85.42)	x	106,002	=	\$(271,439)
<b>Net Sales Variance</b>						\$3,925,318

3) Labor Sales Mix Variance: The labor sales mix variance results from deviations in the total mix of work performed. The sales mix for FRCSW was prior year Periodic Maintenance Interval 1 (PMI 1) and PMI 2, and current year PMI 1 and PMI 2. The formula used to accomplish the analysis can be expressed as follows:

$\text{Labor Sales Mix Variance} = (\text{AAR} - \text{BAR}) \times \text{AQ}$ <p>AAR = Actual Average Rate</p>
---

The actual average rate is the actual average stabilized rate used for sales. The results of the calculations are depicted in Table 2.

A negative, or unfavorable, labor sales mix variance indicates that the change in sales mix reduced the total sales dollars. Conversely, a positive or favorable sales mix variance indicates that the change in sales mix increased the total sales dollars.

***b. Material Sales and Expense Variance***

Direct material sales are intended to reimburse FRCSW for the cost of direct materials utilized in performing work on aircraft. If FRCSW were to bill customers for all direct material costs incurred, then net income from direct material would be zero. However, FRCSW charges a fixed price for E-2C materials. This price is an estimate of what the material should cost FRCSW. A variance between the actual and estimated cost could have a positive or negative effect on operating results depending on which direction the cost changed, while a variance in quantity of work should have a zero net effect on FRCSW’s operating results due to material.

Budgeted and actual direct material sales were compared to determine the net change in the effect on the overall operating results (Table 3). Fiscal year 2007 is the only year analyzed as sufficient data were not available for previous years. A variance was also calculated for budgeted to actual direct material sales and budgeted to actual direct material expense. Variances for material sales and expenses reflect changes due to both price and amount of direct materials used. A net loss for direct materials indicates that FRCSW was not able to bill customers for all the direct material costs incurred.

Table 3. FRCSW, E-2C, 2007 Material Sales Variances

	<b>Budget</b>	<b>Actual</b>	<b>Variance</b>
Direct Material Sales	\$7,348,653	\$14,082,916	\$ 6,734,264
Direct Material Costs	<u>\$7,202,189</u>	<u>\$17,773,366</u>	<u>\$(10,571,177)</u>
Net Income/(Loss)	\$ 146,464	\$(3,690,450)	\$ 3,836,913

*c. Civilian Labor Expense Variance*

The labor expense variance consists of variances due to labor rates and labor quantity. The sum of the two variances is the total variance for labor expense. The labor rate variance results from deviations from the budgeted average hourly wages paid for direct labor government workers. The formula used to accomplish the analysis can be expressed as follows:

Labor rate variance = (BR – AR) x AH  
 BR = Budget Rate  
 AR = Actual Rate  
 AH = Actual Hours

The budget rate is the average hourly wage to be paid for each hour of direct labor work. FRCSW refers to the average hourly rate as the composite rate. The actual rate is the average hourly wage paid to direct labor workers by FRCSW. The actual hours are the actual direct labor hours of work performed on E-2C aircraft. The results of the calculations are depicted in Table 4. Table 4 is broken out by fiscal year and shows the labor rate variance for each fiscal year.

A negative, or unfavorable, labor rate variance indicates that the actual average hourly wage increased from the amount anticipated in the budget. Conversely a positive, or favorable, labor rate variance indicates that the average hourly wage paid for direct labor was lower than anticipated in the budget.

Table 4. FRCSW, E-2C, Civilian Labor Rate Variance

2004						2005							
(Budget	Actual		Actual			(Budget	Actual		Actual				
Rate	-	Rate)	x	Hours	=	Variance	Rate	-	Rate)	x	Hours	=	Variance
(\$34.37	-	\$34.48)	x	97,555	=	\$(10,731)	(\$33.21	-	\$35.80)	x	95,422	=	\$(247,143)
2006						2007							
(Budget	Actual		Actual			(Budget	Actual		Actual				
Rate	-	Rate)	x	Hours	=	Variance	Rate	-	Rate)	x	Hours	=	Variance
(\$34.55	-	\$36.95)	x	119,527	=	\$(286,865)	(\$36.68	-	\$38.11)	x	96,022	=	\$(137,311)

The labor quantity variance results from changes in the workload quantity from the budget numbers. The workload quantity in this case is measured by direct labor hours. The formula used to accomplish the analysis can be expressed as follows:

$\text{Labor quantity variance} = (\text{BH} - \text{AH}) \times \text{BR}$ <p>BH = Budget Hours          AH = Actual Hours          BR = Budget Rate</p>
---

The budget hours are the number of direct labor hours of work to be performed on E-2C aircraft anticipated in the budget. The effect of the variance from budget hours to actual hours is depicted in Table 5. Table 5 is broken out by fiscal year and shows the labor quantity variance for each fiscal year.

Table 5. FRCSW, E-2C, Civilian Labor Quantity Variance

2004				2005			
(Budget Hours	- Actual Hours)	x Budget Rate	= Variance	(Budget Hours	- Actual Hours)	x Budget Rate	= Variance
(122,622	- 97,555)	x \$34.37	= \$861,553	(175,500	- 95,422)	x \$33.21	= \$2,659,390
2006				2007			
(Budget Hours	- Actual Hours)	x Budget Rate	= Variance	(Budget Hours	- Actual Hours)	x Budget Rate	= Variance
(158,495	- 119,527)	x \$34.55	= \$1,346,344	(48,834	- 96,022)	x \$36.68	= \$(1,730,856)

A negative, or unfavorable, labor quantity variance, as seen in 2007, reflects the increase from budgeted labor expense due to an increase in workload quantity as measured by direct labor hours. Conversely a positive, or favorable, labor quantity variance as seen in 2004 through 2006 reflects the decrease from budgeted labor expense due to a decrease in workload quantity as measured by direct labor hours.

*d. Contract Labor Expense Variance*

The contract labor expense variance results from variances in the contract labor rate and variances in the workload quantity performed by contract laborers. The

sum of the two variances is the total variance for contract labor expense. The contract labor rate variance results from deviations from the budgeted average hourly rates paid to the contractor. The formula used to accomplish the analysis can be expressed as follows:

$\text{Contract labor rate variance} = (\text{BR} - \text{AR}) \times \text{AH}$ <p>BR = Budget Rate  AR = Actual Rate  AH = Actual Hours</p>
---

The budget rate is the average hourly price to be paid to the contractor for each hour of contract labor work. The actual rate is the average hourly price paid to the contractor by FRCSW. The actual hours are the actual number of contract labor hours work performed on E-2C aircraft. The results of the calculations are depicted in Table 6. Table 6 is broken out by fiscal year and shows the contract labor rate variance for each fiscal year.

Table 6. FRCSW, E-2C, Contract Labor Rate Variance

2004					2005								
(Budget	Actual	Actual			(Budget	Actual	Actual						
Rate	-	Rate)	x	Hours	=	Variance	Rate	-	Rate)	x	Hours	=	Variance
(\$32.44	-	\$35.47)	x	17,126	=	\$(51,973)	(\$24.51	-	\$41.86)	x	15,516	=	\$(269,200)
2006					2007								
(Budget	Actual	Actual			(Budget	Actual	Actual						
Rate	-	Rate)	x	Hours	=	Variance	Rate	-	Rate)	x	Hours	=	Variance
(\$53.44	-	\$44.57)	x	16,927	=	\$150,104	(\$33.14	-	\$32.22)	x	9,980	=	\$9,151

A negative, or unfavorable, contractor labor rate variance means that the actual average hourly contract labor rate has increased from what had been anticipated in the budget. Conversely a positive, or favorable, contractor labor rate variance means that the average hourly contract rate paid for contract labor was lower than anticipated in the budget.



*e. Production Overhead Expense Variance*

The production overhead expense variance results from the production overhead spending variance and the total workload quantity variance. The sum of the two variances is the total variance for the production overhead expense.

The production overhead spending variance is attributed to deviations from the budgeted production overhead prices paid for items such as indirect labor, indirect materials, and facilities expenses. The formula used to accomplish the analysis can be expressed as follows:

Production overhead spending variance = (BR – AR) x AH  
 BR = Budget Rate  
 AR = Actual Rate  
 AH = Actual Hours

The budget rate is the amount of production overhead expenses to be applied for each hour of direct labor work, whether performed by government civilian or contractor labor. The actual rate is the amount of production overhead expense actually applied, plus or minus the over or under applied costs for each direct labor hour of work performed by FRCSW. The actual hours are the actual number of direct labor hours of work performed on E-2C aircraft. The results of the calculations are depicted in Table 8. Table 8 is broken out by fiscal year and shows the production overhead spending variance for each fiscal year.

Table 8. FRCSW, E-2C, Production Overhead Spending Variance

2004				2005			
(Budget	Actual	Actual		(Budget	Actual	Actual	
Rate	- Rate)	x	Hours = Variance	Rate	- Rate)	x	Hours = Variance
(\$32.04	- \$33.19)	x	114,681 = \$(131,883)	(\$33.22	- \$34.03)	x	110,938 = \$(89,860)
2006				2007			
(Budget	Actual	Actual		(Budget	Actual	Actual	
Rate	- Rate)	x	Hours = Variance	Rate	- Rate)	x	Hours = Variance
(\$39.09	- \$37.92)	x	136,454 = \$159,651	(\$37.85	- \$40.93)	x	106,002 = \$(326,486)



A negative, or unfavorable, production overhead spending variance means that the average price of production overhead expenses has increased from what had been anticipated in the budget. Conversely a positive, or favorable, production overhead spending variance means that the average price of production overhead expenses was lower than anticipated in the budget.

The production overhead quantity variance results from changes in the workload quantity from the budget amount. The workload quantity in this case is measured by direct labor hours (contract and government civilian employees). The formula used to accomplish the analysis can be expressed as follows:

Production overhead quantity variance = (BH – AH) x BR  
 BH = Budget Hours  
 AH = Actual Hours  
 BR = Budget Rate

The budget hours are the direct labor hours to be performed on E-2C aircraft anticipated in the budget. In the case of FRCSW, the effects of the changes from budget hours to actual hours are depicted in Table 9. Table 9 is broken out by fiscal year and shows the production overhead quantity variance for each fiscal year.

Table 9. FRCSW, E-2C, Production Overhead Quantity Variance

2004				2005			
(Budget Hours	-	Actual Hours)	x	Budget Rate	=	Variance	
(154,331	-	114,681)	x	\$32.04	=	\$1,270,386	
2006				2007			
(Budget Hours	-	Actual Hours)	x	Budget Rate	=	Variance	
(158,495	-	136,454)	x	\$39.09	=	\$861,583	
(Budget Hours	-	Actual Hours)	x	Budget Rate	=	Variance	
(56,873	-	106,002)	x	\$37.85	=	\$(1,859,533)	

A negative, or unfavorable, production overhead quantity variance, as seen in 2007, reflects the increase from budgeted applied production overhead expense due to an increase in workload quantity as measured by direct labor hours. Conversely a positive, or favorable, production overhead quantity variance, as seen in 2004 through

2006, reflects the decrease from budgeted applied production overhead expense due to a decrease in workload quantity as measured by direct labor hours.

*f. General & Administrative Expense Variance*

The G&A expense variance results from variances in G&A spending and workload quantity. The sum of the two variances is the total variance for G&A expense.

The G&A spending variance results from deviations from the budgeted G&A prices paid for items such as executive staff costs and support expenses. The formula used to accomplish the analysis can be expressed as follows:

$\text{G\&A spending variance} = (\text{BR} - \text{AR}) \times \text{AH}$ <p>BR = Budget Rate AR = Actual Rate AH = Actual Hours</p>
---

The budget rate is the amount of G&A expense that will be applied for each hour of direct labor work. The actual rate is the amount of G&A expense actually applied, plus or minus the over or under applied costs for each direct labor hour of work performed by FRCSW. The actual hours are the actual number of direct labor hours of work performed on E-2C aircraft. The results of the calculations are depicted in Table 10. Table 10 is broken out by fiscal year and shows the G&A spending variance for each fiscal year.

A negative, or unfavorable, G&A spending variance means that the average price of G&A expenses has increased from what had been anticipated in the budget. Conversely a positive, or favorable, G&A spending variance means that the average price of G&A expenses was lower than anticipated in the budget.

Table 10. FRCSW, E-2C, General and Administrative Spending Variance

2004				2005			
(Budget	Actual	Actual		(Budget	Actual	Actual	
Rate	-	Rate)	x Hours = Variance	Rate	-	Rate)	x Hours = Variance
(\$12.90	-	\$9.07)	x 114,681 = \$439,228	(\$12.47	-	\$14.23)	x 110,938 = \$(195,251)
2006				2007			
(Budget	Actual	Actual		(Budget	Actual	Actual	
Rate	-	Rate)	x Hours = Variance	Rate	-	Rate)	x Hours = Variance
(\$13.61	-	\$12.72)	x 136,454 = \$121,444	(\$16.57	-	\$14.97)	x 106,002 = \$169,603

The G&A quantity variance results from changes in the workload quantity from the budgeted numbers. The workload quantity in this case is measured by direct labor hours (contract and government employees). The formula used to accomplish the analysis can be expressed as follows:

<p>G&amp;A quantity variance = (BH – AH) x BR                  BH = Budget Hours                  AH = Actual Hours                  BR = Budget Rate</p>
---

The budget hours are the direct labor hours to be performed on E-2C aircraft anticipated in the budget. In the case of FRCSW, the effects of the changes from budget hours to actual hours are depicted in Table 11. Table 11 is broken out by fiscal year and shows the G&A quantity variance for each fiscal year.

Table 11. FRCSW, E-2C, General and Administrative Quantity Variance

2004				2005			
(Budget	Actual	Budget		(Budget	Actual	Budget	
Hours	-	Hours)	x Rate = Variance	Hours	-	Hours)	x Rate = Variance
(154,331	-	114,681)	x \$12.90 = \$511,485	(209,954	-	110,938)	x \$12.47 = \$1,234,730
2006				2007			
(Budget	Actual	Budget		(Budget	Actual	Budget	
Hours	-	Hours)	x Rate = Variance	Hours	-	Hours)	x Rate = Variance
(158,495	-	136,454)	x \$13.61 = \$299,978	(56,873	-	106,002)	x \$16.57 = \$(814,068)

A negative, or unfavorable, G&A quantity variance, as seen in 2007, reflects the increase from budgeted applied G&A expense due to an increase in workload

quantity as measured by direct labor hours. Conversely a positive, or favorable, G&A quantity variance, as seen in 2004 through 2006, reflects the decrease from budgeted applied G&A expense due to a decrease in workload quantity as measured by direct labor hours.

#### **D. SUMMARY**

This project began with collecting the cost and revenue data, then computing and analyzing the variances, and finally providing areas for management to ask questions to gain a better understanding of the origins of the variances. This chapter defined variance analysis and discussed how the data for this analysis were collected. It then provided a walkthrough of the steps taken to conduct the variance analysis of the financial results from FRCSW's depot-level maintenance of the E-2C Hawkeye repair and overhaul work. Chapter IV summarizes the results of this analysis.

## **IV. FINDINGS AND ANALYSIS**

### **A. INTRODUCTION**

This chapter interprets the results of the analysis described in Chapter III. The results are discussed in terms of labor sales variance, material sales variance, material expense variance, rate and spending variances, and quantity variances. For a profit oriented enterprise, a positive variance is favorable and a negative variance is unfavorable. However, since the goal of a working capital fund enterprise is to achieve a net zero operating result, both a positive or negative variance could both be interpreted as bad, since the goal is to achieve a zero variance.

### **B. RESULTS OF VARIANCE ANALYSIS**

#### **1. Labor Sales Variance**

The results of the analysis of the 2007 labor sales variance are presented below in Table 12. With only one year's worth of analysis, a trend for the labor sales variance cannot be determined. The major cause of the labor sales variance was a result of the positive \$4.2 million sales quantity variance. Sales rate, or stabilized rate, is not a factor in the total labor sales variance because the actual and budgeted sales rates are the same. The sales mix provided a negative variance. However, the negative sales mix variance is considered relatively insignificant when compared to the much larger positive sales quantity variance. To summarize, the overwhelming cause of the variance in labor sales indicates that the amount of actual work performed, as measured in direct labor hours, was significantly higher than anticipated in the budget.

Table 12. FRCSW, E-2C, 2007 Labor Sales Variances

	<b>Variances</b>	<b>Percent Budget Sales</b>
Sales Quantity	\$4,196,758	34%
Sales Rate	\$0.00	0%
Sales Mix	<u>(\$271,439)</u>	2%
Total Sales	\$3,925,318	32%

## 2. Material Sales Variance

The results of the FY 2007 material sales variance analysis are presented below in Table 13. With only one year's worth of analysis a trend in material sales variances cannot be determined. There are two results of note from this analysis: the value of the actual net income/(loss), and the budget to actual direct material sales variance.

The result of a \$3.7 million loss in net income indicates that FRCSW did not get reimbursed for all of the material costs incurred during FY 2007. Without additional analysis it is not possible to determine if this is due to changes in the cost, quantity, or mix of material.

Also, the actual material sales were approximately twice the amount anticipated in the budget. While this analysis is not detailed enough to determine the causal factors, some possibilities include changes in material prices, types of material purchased, or the quantity of material used.

Table 13. FRCSW, E-2C, 2007 Material Sales Variances

	<b>Budget</b>	<b>Actual</b>	<b>Variance</b>	<b>Percent Budget</b>
Direct Material Sales	\$7,348,653	\$14,082,916	\$6,734,264	92%
Direct Material Costs	<u>\$7,202,189</u>	<u>\$17,773,366</u>	<u>(\$10,571,177)</u>	147%
Net Income/(Loss)	\$146,464	(\$3,690,450)	(\$3,836,913)	

### 3. Material Expense Variance

The results of the material expense variance analysis for fiscal years 2004 through 2007 are presented below in Table 14. In this table, the FY 2007 result is the only year with a negative material expense variance. The trend for fiscal years 2004 to 2006 had been consistently positive. This means that, for the first three years of this analysis, FRCSW spent less on materials than they had anticipated in the budget. While this analysis is not detailed enough to determine the cause of the variances, some possible causes could be changes in material prices, types of material purchased, or the quantity of material used.

Table 14. FRCSW, E-2C, Material Expense Variance

	<b>Budget</b>	<b>Actual</b>	<b>Variance</b>	<b>Percent Budget</b>
2004	\$11,523,886	\$ 6,981,699	\$ 4,542,187	39%
2005	\$18,068,717	\$13,372,654	\$ 4,696,063	26%
2006	\$17,353,368	\$10,134,530	\$ 7,218,838	42%
2007	<u>\$ 7,202,189</u>	<u>\$17,773,366</u>	<u>\$(10,571,177)</u>	147%
Total	\$54,148,160	\$48,262,249	\$ 5,885,911	

### 4. Rate & Spending Variance

The results of the FRCSW expense rate and spending variance analyses are presented below in Table 15. A trend did not emerge for the various expense rate and spending variances. Civilian labor rate variances were consistently negative for the four years analyzed. General and administrative spending variances were positive for three of the four years. The total rate/spending variance for each year fluctuated between a positive and negative variance, thus lacking a trend.

Table 15. FRCSW, E-2C, Expense Rate & Spending Variance

	2004	Percent Budget	2005	Percent Budget	2006	Percent Budget	2007	Percent Budget
Civilian Labor	\$(10,731)	0.3%	\$(247,143)	4%	\$(286,865)	5%	\$(137,311)	8%
Contract Labor	\$(51,973)	5%	\$(269,200)	32%	\$150,104	20%	\$ 9,151	3%
POH	\$(131,883)	3%	\$( 89,860)	1%	\$159,651	3%	\$(326,486)	15%
G&A	\$439,228	22%	\$(195,251)	7%	\$121,444	6%	\$169,603	18%
Total	\$244,641	2%	\$(801,454)	5%	\$144,334	1%	\$(285,044)	6%

## 5. Quantity Variance

The results of the FRCSW expense quantity variance analysis are presented below in Table 16. From 2004 through 2006, the trend had been positive total expense quantity variances. Additionally, in those same years, except for the contract labor quantity variance, the analysis of the individual line items resulted in positive quantity variances. However, while the variances were positive, they fluctuated considerably. This indicates that while there has been great fluctuation in the amount of work planned versus actually performed, as measured by direct labor hours, the budget for FRCSW had consistently anticipated a higher quantity of work than what was actually performed in 2004 through 2006.

Table 16. FRCSW, E-2C, Expense Quantity Variance

	2004	Percent Budget	2005	Percent Budget	2006	Percent Budget	2007	Percent Budget
Civilian Labor	\$ 861,553	20%	\$2,659,390	46%	\$1,346,344	25%	\$(1,730,856)	97%
Contract Labor	\$ 473,073	46%	\$ 464,170	55%	\$(123,927)	16%	\$ (64,317)	24%
POH	\$1,270,386	26%	\$3,357,633	48%	\$ 861,583	14%	\$(1,859,533)	86%
G&A	\$ 511,485	26%	\$1,234,730	47%	\$ 299,978	14%	\$ (814,068)	86%
Total	\$3,116,496	26%	\$7,715,923	47%	\$2,383,978	16%	\$(4,468,773)	87%

## C. SUMMARY

The results of the variance analysis have been described throughout this chapter. The analysis results were grouped into labor sales variance, material sales variance, material expense variance, rate and spending variances, and expense quantity variances.



The findings from the variance analyses indicate that factors creating the most significant impact to the FRCSW's operating results are material sales net loss, materials expense variance, and the quantity variances. Chapter V will address what these results mean and what the takeaways from this project may be.

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## **V. CONCLUSION AND RECOMMENDATIONS**

### **A. INTRODUCTION**

The operations of defense working capital fund activities, as discussed here with FRCSW, are affected by myriad factors both internally and externally. FRCSW, as a NWCF, works within the confines of the Planning Programming Budgeting and Execution System (PPBES) cycle and is subsequently influenced by the competition for scarce resources. The extent to which its customers have had to compete for scarce resources has eroded much of the intended customer-provider relationship proposed by the formation of DWCFs. This is evidenced by the feedback from interviewees regarding the material price changes during the budget submission and rate setting process.

The primary purpose of this research was to determine what factors were having the greatest impact on the financial operating results of FRCSW, creating significant fluctuations in the year to year results.

The Navy and FRCSW managers have limited time and resources. Knowing where they can focus efforts to get the highest return on their process improvement efforts will enable the best possible return on investment of time and resources.

### **B. PRIMARY QUESTION**

#### **1. What are Factors Affecting the Operating Results at FRCSW?**

The results of the variance analysis summarized in Chapter IV show that the factors affecting the operating results the most were the material sales variances, material expense variances, and the variances due to quantity of work.

Since 2007 was the only year that a full variance analysis (sales and expense) was conducted, 2007 will be explained by itself. The material sales variance analysis supports the feedback provided by interviewees that FRCSW has not been able to recoup the cost of material used through material sales. As can be derived from the data in

Chapter IV Table 13, the actual loss from this lack of recoupment is roughly 21 percent of the total cost of materials. Although important, identifying the cause of this lack of recoupment was beyond the scope of this project.

The comparison of budget and actual sales shows that the material sales variance accounted for over 63 percent of the total sales variance for 2007 (Chapter III Table 1) and was the largest contributor to the favorable sales variance. In 2007, the factor providing the largest contribution to the unfavorable variance in expenses was material expenses. The \$10.6 million in material expense variance accounted for over 68 percent of the total expense variance.

The workload quantity was the most significant underlying factor for labor sales in 2007 and labor expenses in 2004 through 2006. This indicates that the Navy budgeting process is having difficulty estimating the number of E-2C aircraft requiring work to be conducted by FRCSW. The number of aircraft FRCSW was authorized to budget for has been greater or less than what they actually inducted.

In 2002, Major Scott Griffith completed a NPS thesis titled, “An analysis of the factors affecting the Net Operating Results at Naval Aviation Depot Cherry Point, North Carolina.” His thesis included a variance analysis of labor expense, production overhead expense, and G&A expense for two aircraft models and two engine types for three fiscal years. His conclusions indicated that the unfavorable efficiency variance, called quantity variance in this project, could have been caused by the workload standards being consistently underestimated. Major Griffith’s findings seem in-line with the findings here that quantity of work has a significant affect on aviation depot-level maintenance activity’s operating results (Griffith, 2002).

## **C. SECONDARY QUESTIONS**

### **1. Is the Current Model Accurate at Predicting Workload Quantity?**

In 2004-2007, the quantity variances as a percent of the budgeted costs (less material) was 25.6 percent, 47.5 percent, 16.3 percent and 86.7 percent, respectively, for

each year. This analysis indicates that the budget, or benchmark, for workload was not accurate and caused large variations in the operating results.

Although this project did not break down material variances in as much detail as the other expense items, the material expense variance may also be due to inaccurate predictions of the workload quantity. Unfortunately, the data supporting this analysis of material expenses were not detailed enough to indicate the cause of material variances presented in this project. However, since the material expense variances fluctuate positively and negatively in the same years as the quantity variances for the other expenses (civilian labor, contract labor, G&A, and POH; see Table 14 and Table 16) it is reasonable to assume that there is a correlation between the workload quantity and material expense. Therefore, the workload quantity would likely be the most significant contributor to material sales and expense variances.

## **2. Is the Current Model Accurate at Predicting the Labor Rates?**

This analysis indicates that FRCSW was reasonably accurate at predicting the civilian and contractor labor rates for FY 2004-2007. The labor rate variance for each year was 0.51 percent, 3.2 percent, 0.94 percent, and 2.5 percent of the total budgeted costs (less material) for each year, respectively.

## **3. Is the Current Model Accurate at Predicting Overhead and G&A Rates?**

Production Overhead and G&A rates were also reasonably accurately predicted. The POH and G&A rate variances were 2.5 percent, 1.8 percent, 1.9 percent, and 3.0 percent of the total budgeted costs (less material) for each year, respectively.

## **4. Where Should the Office of Budget (FMB), Commander FRCs (COMFRC), and FRCSW Invest Resources to Reduce the Size of Variances?**

This analysis indicated that the budget to actual material variances were extremely large but not sufficiently analyzed in this project to provide an understanding of possible underlying causes. A focused analysis of the causes of material variances is

recommended. Since this project indicates that FRCSW has been unable to fully recover the cost of materials, as designed in the NWCF process, it would be beneficial to determine why this is happening.

This analysis reinforced the feedback from interviewees that the quantity of work had a strong influence over the operating results for the E-2C program. It may be beneficial to develop a system to more accurately predict the quantity of work that FRCSW will be required to perform.

#### **D. RECOMMENDATIONS FOR FURTHER RESEARCH**

This project only scratched the surface of managerial accounting analysis to help FRCSW and subsequently the Navy Working Capital Fund uncover the factors affecting the operating results for aircraft depot-level maintenance activities. Based upon the issues and results revealed in this project, the following are some recommendations offered to provide additional insight into causal factors of variances in the operating results for FRCSW.

1. Since there was only one year of complete data, FY 2007, to conduct a variance analysis, it may be beneficial to conduct a sales variance analysis on at least several more years of data to determine if any trends in sales results exist.
2. A focused analysis should be conducted on material variances for all type/model/series aircraft. This analysis indicated that the largest line item that affected the operating results of FRCSW was material.
3. Develop a method to more accurately predict material costs and recover material costs from the customers.
4. Analyze whether other state or federal revolving fund activities operate better without losing independence during the customer's budget processes.

## **E. CONCLUSION**

Depot-level maintenance activities provide an invaluable service to the fleet and the warfighter. However, operating a working capital fund activity within the construct of the Navy's PPBE system presents many challenges and difficulties in the financial operating results. For FRCSW, it appears that the factors affecting these operating results are: accurately forecasting the material to budget for, reimbursement for the material that was used, and accurately predicting the quantity of work that will be performed. Focusing on the aforementioned factors may prevent the need for drastic fluctuations in recovery rates and provide smoother budgeting evolutions. Since the other two depot-level maintenance activities operate in similar environments to the depot-level maintenance activity at FRCSW, this type of analysis could be beneficial to the other facilities as well.

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## **APPENDIX A. UNITED STATES CODE TITLE 10 HIGHLIGHTS**

### **US Code Title 10 – Armed Forces**

#### **Subtitle A - General Military Law**

#### **Part IV – Service, Supply and Procurement**

#### **Chapter 148 – National Defense Technology and Industrial Base, Defense Reinvestment and Defense Conversion**

##### **Subchapter II – Policies and Planning**

##### *Section 2501 - National security objectives concerning national technology and industrial base*

This section ensures that “the national technology and industrial base be capable of...” “...supplying and equipping the force structure of the armed forces...,” “sustaining production, maintenance, repair and logistics for military operations...,” and provides “...for the development, manufacture, and supply of items and technologies critical to the production and sustainment of advanced weapons systems within the national technology and industrial base” (Title 10). This section establishes the need and sets into law the requirement for industrial type activities, like aviation depot-level maintenance, in support of meeting U.S. national security objectives.

#### **Chapter 146 - Contracting for Performance of Civilian**

##### **Commercial or Industrial Type Functions**

##### *Section 2460 - Definition of depot-level maintenance and repair*

Defines depot-level repair as “material maintenance or repair requiring the overhaul, upgrading, or rebuilding of parts, assemblies, or subassemblies, and the testing and reclamation of equipment as necessary, regardless of the source of funds for the maintenance or repair or location at which the maintenance or repair is performed.” This also includes software maintenance and contractor support. This section does not authorize the procurement or major modifications that improve the weapons system’s

performance or procurement for safety modifications (Title 10). This section defines the scope of work that depot-level maintenance activities are authorized to perform.

*Section 2461 – Commercial or industrial type functions: required studies and reports before conversion to contracting performance and 2461a – Development of system for monitoring cost savings resulting from workforce reductions*

2641 Establishes the required studies and reports that need to be completed prior to converting to a civilian contractor labor force in industrial type activities. Section 2461a establishes the requirement to monitor the workforce conversion for cost savings (Title 10).

*Section 2462- Contracting for certain supplies and services required when cost is lower*

Requires the DoD to procure supplies and services from private industry if private industry's costs are cheaper than the costs to procure the supplies and services from DoD activities (Title 10). This law enforces competition between private and public industry as low cost providers.

*Section 2463 - Collection and retention of cost information data on converted services and functions and Section 2467 – Cost comparisons: inclusion of retirement costs; consultation with employees; waiver of comparison*

2463 requires the SECDEF to collect cost data when converting to contractor support from DoD or converting to DoD to contractor support (Title 10). This requirement allows the SECDEF and Congress to compare cost data to support or not support the conversion. 2467 requires the inclusion of retirement costs when conducting a cost comparison between contractor and DoD performance costs (Title 10).

*Section 2464 – Core logistics capabilities*

Requires the DoD to maintain core logistics capabilities that are essential to national defense. These capabilities “shall include these capabilities that are essential to maintain and repair weapons systems and other military equipment...” (Title 10). This

section also requires the SECDEF to identify the essential core capabilities and ensure sufficient workload to maintain the core logistics functions of the Government-Owned and Government-Operated facilities.

*Section 2466 - Limitations on the performance of depot-level maintenance of material*

Limits the amount of depot-level maintenance and repair work funding that can be used to contract workload. The section states that, “Not more than 50 percent of the funds made available in a fiscal year to a military department...for depot-level maintenance and repair workload may be used to contract for performance by non-Federal Government personnel...” (Title 10). This section ensures the DoD industrial base is maintained.

*Section 2469 – Contracts to perform workloads previously performed by depot-level activities of the Department of Defense: requirement of competition*

Covers competition in the award of contracts for depot-level activities of the DoD. This section requires the SECDEF to ensure that depot-level maintenance and repair is not moved from one depot to another depot or from one depot to a civilian contractor without fair competition. Awards shall be based on merit and follow the competitive procedures. However, this law is exempt for Public-Private Partnerships at a depot that is designated a Center of Industrial and Technical Excellence (Title 10).

*Section 2470 - Depot-level activities of the Department of Defense: authority to compete for maintenance and repair workloads of other Federal agencies*

Authorizes DoD depots to compete for other Federal agencies work (Title 10).

*Section 2472 - Management of depot employees*

Restricts the depot’s leadership to manage government civilian employees by available workload and fund availability only (Title 10).

*Section 2474 - Centers of Industrial and Technical Excellence: designation; public-private partnerships*

Authorizes the SECDEF to designate depots as Centers of Industrial and Technical Excellence in the depot's respective core competency. This designation encourages depots to assimilate best business practices and encourages Public-Private Partnerships to attain the requirements set forth in the SECDEF's policy. The objectives in the SECDEF's policy are:

1. Maximize the utilization of capacity at the depots
2. Reduce costs of the depots
3. Reduce product costs
4. Gain synergy through private industry capital investments
5. Build a relationship with private industry (Title 10).

**Chapter 152 – Issues of Supplies, Services and Facilities**

*Section 2563 – Articles and services of industrial facilities: sale to persons outside the Department of Defense*

Authorizes the SECDEF to sell working capital funded depot products or services to other than DoD activities. The following conditions must be met:

1. Products or services are not available commercially
2. The “purchaser agrees to hold harmless and indemnify the United States”
3. Only incidental subcontracting will occur
4. It is in the U.S. public interest
5. Will not interfere with mission
6. Will not interfere with depot performance

This section opens the depot to the private market.

**Chapter 159 – Real Property; Related Personal Property;  
Lease of Non-Excess Property**

*Section 2687 – Base Closure and realignments*

This section discusses the required procedures and reporting for base closures and realignments (Title 10).

**Chapter 131 – Planning and Coordination**

*Section 2208 – Working Capital Funds*

This section discusses the regulations, procedures, and reporting requirements governing working capital funds (WCF) for industrial type activities. The most applicable paragraphs of Section 2208 to this project are the discussions on full cost recovery of goods and services provided and the accumulation of funds (Title 10).

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**APPENDIX B. BASE CLOSURE AND REALIGNMENT REPORT -  
FRC SUMMARY**

<b>Realign</b>	<b>Disestablish</b>	<b>Establish</b>	<b>Workload and Capacity</b>
NAS Oceana, VA	AIMD Oceana NADEP Jacksonville DET NADEP Cherry Point DET	FRC Mid Atlantic at NAS Oceana, VA	Transfers all I-level maintenance workload and capacity to FRC Mid Atlantic, NAS Oceana, VA
NAS Patuxent River, MD	AIMD NAWC Aircraft Division	FRC Mid Atlantic Site at Patuxent River, NAS Patuxent River, MD	Transfers all I-level maintenance workload and capacity to FRC Mid Atlantic Site Patuxent River, NAS Patuxent River, MD
NAS Norfolk, VA	AIMD Norfolk, VA NADEP Jacksonville DET NAWC Aircraft Division Lakehurst DET	FRC Mid Atlantic Site at Norfolk, NAS Norfolk, VA	Transfers all I-level and D-level maintenance workload and capacity to FRC Mid Atlantic Site Norfolk, NAS Norfolk, VA
NAS JRB New Orleans, LA	AIMD	FRC Mid Atlantic Site at New Orleans, NAS JRB New Orleans, LA	Transfers all I-level maintenance workload and capacity to FRC Mid Atlantic Site New Orleans, NAS JRB New Orleans, LA
MCAS Cherry Point, NC	NADEP Cherry Point	FRC East, MCAS Cherry Point, NC  FRC East Site Beaufort, SC FRC East Site New River, Camp Lejeune, NC	Relocate all D-level maintenance workload and capacity to: FRC Mid Atlantic, NAS Oceana, VA; FRC Mid Atlantic Site Norfolk, NAS Norfolk, VA; FRC Mid Atlantic Site Patuxent River, MD; FRC Mid Atlantic Site New Orleans, NAS JRB New Orleans, LA; FRC East Site Beaufort, SC; FRC East Site New River, Camp Lejeune, NC; FRC East, MCAS Cherry Point, NC
MCAS Beaufort, SC	NADEP Jacksonville DET Beaufort		Transfers all D-level maintenance workload and capacity to FRC East Site Beaufort, SC

<b>Realign</b>	<b>Disestablish</b>	<b>Establish</b>	<b>Workload and Capacity</b>
NAS Jacksonville, FL	NADEP Jacksonville NADEP Jacksonville DET Jacksonville AIMD Jacksonville	FRC Southeast, NAS Jacksonville, FL FRC Southeast Site Mayport, NAS Mayport, FL	Relocate D-level maintenance workload and capacity to FRC Southeast Mayport, FL; Transfer I and D-level maintenance capacity and workload to FRC Southeast, NAS Jacksonville, FL
NAS Mayport, FL	AIMD, NADEP Jacksonville DET Mayport NAWC Aircraft Division Lakehurst VRT DET Mayport		Transfers all I-level maintenance workload and capacity to FRC Southeast Site Mayport, NAS Mayport, FL
NAS Lemoore, CA	AIMD Lemoore NADEP North Island DET	FRC West, NAS Lemoore, CA	Transfers all I-level and D-level maintenance workload and capacity to FRC West, NAS Lemoore, Lemoore, CA
NAS Fallon, NV	AIMD Fallon NADEP North Island DET Fallon	FRC Southwest Site Fallon, NAS Fallon, NV	Transfers all I-level and D-level maintenance workload and capacity to FRC West site Fallon, NAS Fallon, NV
NAWC Weapons Division China Lake, CA	AIMD		Relocating I-level maintenance workload and capacity to FRC West, NAS Lemoore, CA
NAS JRB Fort Worth, TX	AIMD	FRC West Site Fort Worth, NAS Fort Worth, TX	Transfers all I-level maintenance workload and capacity to FRC West Site Fort Worth, NAS JRB Fort Worth, TX
NAS Whidbey Island, WA	AIMD	FRC Northwest, NAS Whidbey Island, WA	Transfers all I-level maintenance workload and capacity to FRC Northwest, NAS Whidbey Island, WA
NSA Crane, IN			Relocate D-level maintenance workload and capacity to FRC Northwest, NAS Whidbey Island, WA



<b>Realign</b>	<b>Disestablish</b>	<b>Establish</b>	<b>Workload and Capacity</b>
NAS North Island, Naval Base Coronado, CA	NADEP North Island COMSEACONWINGPAC (AIMD) NADEP North Island DET North Island	FRC Southwest, NAS North Island, NB Coronado, CA  FRC Southwest Site Point Mugu, NAS Point Mugu, Ventura, CA  FRC Southwest Site Miramar, MCAS Miramar, CA  FRC Southwest Site Pendleton, MCAS Camp Pendleton, CA  FRC Southwest Site Yuma, MCAS Yuma, AZ	Transfer I-level and D-level maintenance workload and capacity to FRC Southwest, NAS North Island, NB Coronado, CA  Relocate D-level maintenance workload and capacity to FRC Southwest Site Point Mugu, CA  Relocate D-level maintenance workload and capacity to FRC Southwest Site Miramar, CA  Relocate D-level maintenance workload and capacity to FRC Southwest Site Pendleton, CA  Relocate D-level maintenance workload and capacity to FRC Southwest Site Yuma, AZ  Relocate D-level maintenance workload and capacity to FRC West Site Fort Worth, TX  Relocate D-level maintenance workload and capacity to FRC Northwest, NAS Whidbey Island, WA
NAS Point Mugu, NB Venture, CA	AIMD		Transfer all I-level maintenance workload and capacity to FRC Southwest Site Point Mugu, CA
MCAS Miramar, CA			Transfer D-level and I-level maintenance workload and capacity to FRC Southwest Site Miramar, CA
MCAS Camp Pendleton, CA			Transfer D-level and I-level maintenance workload and capacity to FRC Southwest Site Pendleton, CA
MCAS Yuma, AZ			Transfer D-level and I-level maintenance workload and capacity to FRC Southwest Site Yuma, AZ

Source: DoD, 2005

**Legend**

AIMD - Aviation Intermediate Maintenance Department  
DET – Detachment  
D-level - Depot level  
FRC - Fleet Readiness Center  
I-level - Intermediate level  
JRB - Joint Reserve Base

MCAS - Marine Corps Air Station  
NADEP - Naval Air Depot  
NAS - Naval Air Station  
NAWC - Naval Air Warfare Center  
NB - Naval Base  
NSA - Naval Support Activity

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**APPENDIX D. DEFENSE WORKING CAPITAL FUND BUSINESS AREAS**

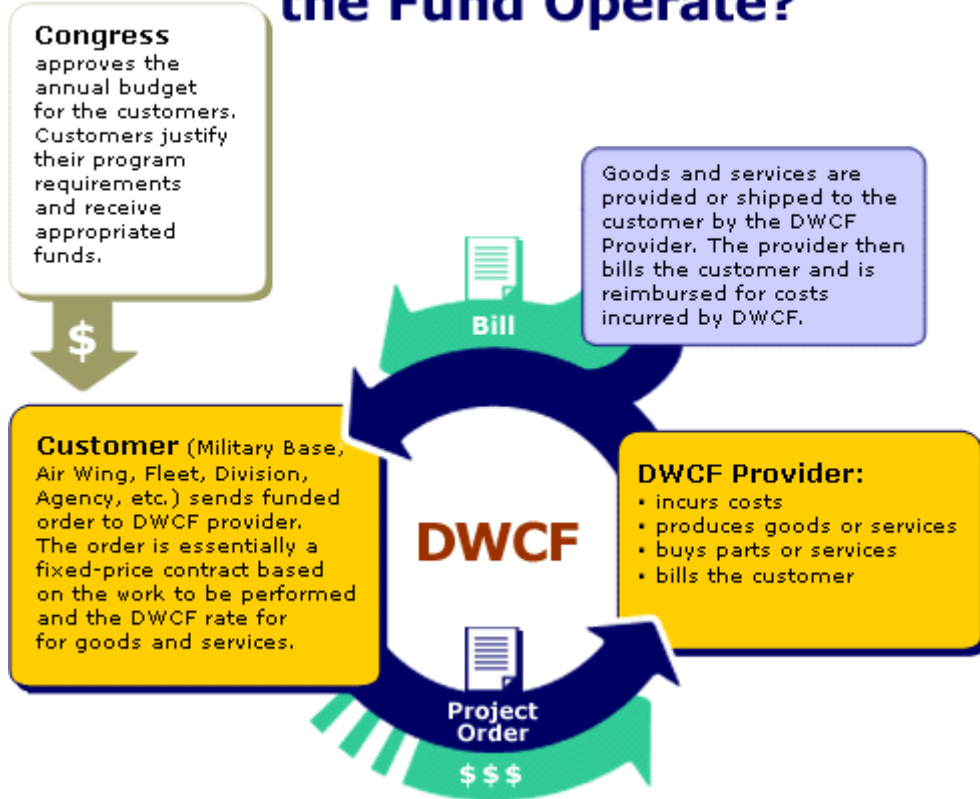
<b>Business Area</b>	<b>Function</b>	<b>Customers</b>
Base Support	Provides utilities services, facility maintenance, transportation support, engineering services, and shore facilities planning	DoD activities
Building Maintenance (BMF)	Finances operation maintenance, protection, and repair of government-owned and leased facilities (exclusive of Pentagon Reservation)	All services
Commissary	Operates stores for resale of groceries and household supplies.	Members of the DoD military services and their families
Defense Reutilization and Marketing Service	Manages excess property within the government; disposes of hazardous property	DoD, Federal agencies, the public
Depot Maintenance	Repairs, overhauls, rebuilds, manufacturers, converts, inspects, and tests materials and vehicles	Army, Navy, Air Force, Marines
Distribution Depots (DDC)	Provides worldwide warehousing for the DoD.	Inventory Control Points within military services and the operating units receiving materials
Financial Operations (DFAS)	Maintains payroll of all military personnel and responsible for all accounting operations.	All DoD services, including vendors, contractors, military personnel and their families
Information Services (DISA)	Provides information processing, software support, communications, technical support, and acquisition services.	Army, Navy, Air Force, Defense agencies, Office of the Secretary of Defense, other Federal agencies
Logistics (DLA)	Operates Supply Management, Distribution Depot, Reutilization and Marketing, and Document Services	DoD Components and other government agencies
National Stockpile Center (DNSC)	Provides safe, secure, and environmentally sound stewardship for materials in the National Defense Stockpile	All services

Ordnance	Manufacturers and demilitarizes ammunition and artillery for all DoD branches, stores and issues ammunition, performs maintenance, and manages logistics of ordnance	All Services and Foreign Military Sales (FMS) for US allies
Pentagon Reservation (PRMRF)	Finances activities of Washington Headquarters Services (WHS) in providing space and building services for DoD Components within the Pentagon Reservation	Pentagon tenants
Printing Services (DAPS)	Provides printing and publication products and services.	DoD activities
Research & Development	Provides research, development, test, evaluation and engineering support	Army, Navy, Air Force, and Office of the Secretary of Defense
Security (DSS)	Conducts personnel security investigations, provides industrial security products and services, provides security training	DoD agencies and other government entities
Supply Management	Manages inventories of fuels, weapon systems consumable, and depot level repairable spare parts.	Army, Navy, Air Force, other DoD agencies
Transportation	Provides airlift and sealift services for personnel and cargo; provides traffic management, land transportation, ocean terminals, and intermodal container management.	All services, Defense Logistics Agency, Joint Chiefs of Staff, Special Operations Command, National Security Agency, other DoD agencies

Source: (OSD(C), 2007)

## APPENDIX E. REVOLVING FUND CASH FLOW

### How Does the Fund Operate?



Source: (OSD(C), 2007)

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## APPENDIX F. REPRESENTATIVE RAW DATA

2006 NI E-2 Product Category - Lotus Notes

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Address

Workspace 5. NI FPI Revised Execution... 2006 NI E-2 Product Category

Data Input Refresh Save Save & Close Close Print Access Source Data

Revenue	Financially Closed Costs	Surcharges	Recoupment
New Orders Received	Allocated Direct Labor Hours	Revenue Billed Direct Labor Hrs	Financial Completions
COH Plan	COH Variance	Execution Plan	Execution Variance

CON Plan

ST Rate	OT Rate	Labor Rate	Material Rate	Contract Rate	Other Rate	Non-Labor Rate	Direct Rate	POH Rate	G&A Rate	Indirect	Total Rate
\$34.42	\$48.14	\$34.55	\$109.49	\$4.79	\$0.00	\$114.28	\$148.84	\$39.09	\$13.61	\$52.71	\$201.54

	Cumulative	Total Budgeted Costs												FY 2006
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	
D I R E C T	ST	\$208,143	\$662,424	\$1,480,852	\$1,965,039	\$2,513,274	\$3,155,702	\$3,482,681	\$3,848,549	\$4,261,256	\$4,611,706	\$4,986,729	\$5,454,638	
	OT	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
	Labor	\$208,143	\$662,424	\$1,480,852	\$1,965,039	\$2,513,274	\$3,155,702	\$3,482,681	\$3,848,549	\$4,261,256	\$4,611,706	\$4,986,729	\$5,454,638	\$5,476,461
	Material	\$662,186	\$2,107,433	\$4,711,177	\$6,251,570	\$7,995,721	\$10,039,541	\$11,079,791	\$12,243,762	\$13,556,747	\$14,671,668	\$15,864,763	\$17,353,368	\$17,353,368
	Contract	\$28,993	\$92,270	\$206,271	\$273,714	\$350,079	\$439,564	\$485,108	\$536,072	\$593,559	\$642,373	\$694,611	\$759,767	\$759,767
	Other	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	Non-Labor	\$691,179	\$2,199,704	\$4,917,448	\$6,525,284	\$8,345,799	\$10,479,105	\$11,564,900	\$12,779,834	\$14,150,306	\$15,314,041	\$16,559,374	\$18,113,155	\$18,113,155
Total Direct	\$899,322	\$2,862,127	\$6,398,300	\$8,490,324	\$10,859,073	\$13,634,807	\$15,047,581	\$16,628,383	\$18,411,562	\$19,925,748	\$21,546,103	\$23,567,793	\$23,589,616	
I N D I R E C T	Production	\$236,446	\$752,498	\$1,682,213	\$2,232,238	\$2,855,020	\$3,584,803	\$3,956,244	\$4,371,661	\$4,840,687	\$5,238,790	\$5,664,807	\$6,196,340	\$6,196,340
	G & A	\$82,341	\$262,055	\$585,825	\$777,370	\$994,251	\$1,248,396	\$1,377,748	\$1,522,487	\$1,685,754	\$1,824,392	\$1,972,751	\$2,157,856	\$2,157,856
	Total Ind	\$318,787	\$1,014,553	\$2,268,038	\$3,009,608	\$3,849,271	\$4,833,200	\$5,333,993	\$5,894,348	\$6,526,441	\$7,063,182	\$7,637,557	\$8,354,196	\$8,354,196

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2006 NI E-2 Product Category - Lotus Notes

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Workspace 5. NI FPI Revised Execution... X 2006 NI E-2 Product Category X

1 Data Input 2 Refresh 3 Save 4 Save & Close 5 Close 6 Print

### Stabilized, Execution and Actual Rates

	STABILIZED	COH	EXECUTION											
ST Rate	\$34.59	\$34.42												
OT Rate	\$0.00	\$46.14												
Direct Labor Rate	\$34.59	\$34.55												
Direct Material Rate	\$0.00	\$114.28												
Production Rate	\$31.79	\$39.09												
G & A Rate	\$10.85	\$13.61												
Adjustment	\$1.05													
<b>Total Rate - Material</b>	<b>\$78.28</b>	<b>\$87.26</b>												
<b>Total Rate</b>	<b>\$78.28</b>	<b>\$201.54</b>												
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept		
ST Rate	\$35.18	\$34.51	\$34.54	\$34.57	\$34.95	\$35.25	\$35.27	\$35.45	\$35.36	\$35.38	\$35.40	\$35.43		
OT Rate	\$47.20	\$46.94	\$46.72	\$47.01	\$47.55	\$47.46	\$47.30	\$47.44	\$47.44	\$47.51	\$47.62	\$47.78		
Direct Labor Rate	\$37.07	\$36.26	\$36.23	\$36.35	\$36.83	\$37.04	\$37.06	\$37.08	\$36.85	\$36.87	\$36.89	\$36.95		
Direct Material Rate	\$163.06	\$114.06	\$86.54	\$97.34	\$83.46	\$85.83	\$84.98	\$97.74	\$98.28	\$97.16	\$94.42	\$92.35		
Production Rate	\$36.39	\$36.43	\$36.42	\$37.33	\$38.00	\$39.60	\$40.20	\$40.31	\$40.69	\$39.89	\$38.29	\$37.17		
G & A Rate	\$14.34	\$14.46	\$14.51	\$14.74	\$15.15	\$15.45	\$15.33	\$15.25	\$15.08	\$14.92	\$14.57	\$14.32		
<b>Total Rate - Material</b>	<b>\$87.80</b>	<b>\$87.15</b>	<b>\$87.16</b>	<b>\$88.41</b>	<b>\$89.98</b>	<b>\$92.10</b>	<b>\$92.59</b>	<b>\$92.64</b>	<b>\$92.63</b>	<b>\$91.68</b>	<b>\$89.76</b>	<b>\$88.45</b>		
<b>Total Rate</b>	<b>\$250.85</b>	<b>\$201.21</b>	<b>\$173.70</b>	<b>\$185.76</b>	<b>\$173.44</b>	<b>\$177.93</b>	<b>\$177.57</b>	<b>\$190.38</b>	<b>\$190.91</b>	<b>\$188.84</b>	<b>\$184.18</b>	<b>\$180.79</b>		

COMMENTS

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2006 NI E-2 Product Category - Lotus Notes

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Workspace 5. NI FPI Revised Execution... 2006 NI E-2 Product Category

1 Data Input 2 Refresh 3 Save 4 Save & Close 5 Close 6 Print

Revenue	Financially Closed Costs	Surcharges	Recoupment
New Orders Received	Allocated Direct Labor Hours	Revenue Billed Direct Labor Hrs	Financial Completions
COH Plan	COH Variance	Execution Plan	Execution Variance

Actual Costs

Cumulative Monthly Total Actual Costs Assumptions

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
<b>DIRECT</b>												
ST	\$249,424	\$457,490	\$710,388	\$1,061,566	\$1,407,824	\$1,904,990	\$2,214,648	\$2,552,954	\$2,903,261	\$3,190,396	\$3,483,370	\$3,714,207
OT	\$62,273	\$101,520	\$155,034	\$240,756	\$335,155	\$441,180	\$517,903	\$537,393	\$551,116	\$597,538	\$651,961	\$702,698
Labor	\$311,697	\$559,010	\$865,423	\$1,302,322	\$1,742,979	\$2,346,170	\$2,732,551	\$3,090,347	\$3,454,376	\$3,787,934	\$4,135,331	\$4,416,905
Material	\$1,342,364	\$1,675,276	\$1,924,244	\$3,284,767	\$3,685,806	\$5,026,139	\$5,729,532	\$7,536,034	\$8,502,523	\$9,199,173	\$9,755,125	\$10,134,530
Contracts	\$28,758	\$79,998	\$112,282	\$149,040	\$189,287	\$299,655	\$416,287	\$480,980	\$571,836	\$645,835	\$686,165	\$754,475
Other	\$0	\$3,314	\$30,597	\$53,795	\$74,963	\$109,942	\$119,997	\$129,070	\$137,677	\$137,989	\$140,578	\$148,991
Non-Labor	\$1,371,122	\$1,758,588	\$2,067,124	\$3,487,602	\$3,950,055	\$5,435,736	\$6,265,816	\$8,146,084	\$9,212,036	\$9,982,998	\$10,583,869	\$11,037,996
Total Direct	\$1,682,819	\$2,317,598	\$2,932,546	\$4,789,923	\$5,693,034	\$7,781,906	\$8,998,367	\$11,236,431	\$12,666,412	\$13,770,931	\$14,719,199	\$15,454,901
<b>INDIRECT</b>												
Production	\$350,310	\$666,692	\$1,016,070	\$1,535,870	\$2,073,269	\$2,869,622	\$3,398,193	\$3,841,888	\$4,356,858	\$4,677,332	\$4,900,207	\$5,071,809
S & A	\$138,060	\$264,719	\$404,850	\$606,529	\$826,601	\$1,119,568	\$1,296,371	\$1,453,576	\$1,614,628	\$1,749,725	\$1,864,859	\$1,954,504
Total Indirect	\$488,370	\$931,411	\$1,420,920	\$2,142,400	\$2,899,870	\$3,989,190	\$4,694,564	\$5,295,464	\$5,971,486	\$6,427,057	\$6,765,066	\$7,026,313

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2006 NI E-2 Product Category - Lotus Notes

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Workspace 5. NI FPI Revised Execution... X 2006 NI E-2 Product Category X

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### 2006 North Island E-2 Product Category

Fiscal Year	Location	Program	Standard Rollup
2006	North Island	Aircraft	E-2/C-2
Product Category	Manager	Analyst(s)	Rollups
E-2	Joseph A Caoile/GenUsers/NADEFN/NAVAIR	Primary Analyst: Ellen Lopez/FIN Ellen Lopez/FIN Rosa Leclias/FIN	920 CCTR E-2/C-2 E2/C2/2MOD E2/C2/IMC E2/C2/2MOD/IMC

Charts

Summary	Rates	Actual Costs	Net Operating Results
Revenue	Financially Closed Costs	Surcharges	Recoupment
New Orders Received	Allocated Direct Labor Hours	Revenue Billed Direct Labor Hrs	Financial Completions
COH Plan	COH Variance	Execution Plan	Execution Variance

#### Allocated Direct Labor Hours

Cumulative | Monthly | Variance | Variance% | Explanations of Variances | Assumptions

Straight Time | Over Time | Contractor/FNI | Total Hours

	Oct	Nov	Dec 01	Jan	Feb	Mar 02	Apr	May	Jun 03	Jul	Aug	Sept 04
CON	6,048	19,248	43,029	57,098	73,028	91,695	101,196	111,627	123,619	134,002	144,899	158,495
Execution	14,916	31,718	46,409	61,370	76,814	92,485	106,205	122,437	136,298	149,909	162,678	175,439
Actuals	9,627	18,302	27,900	41,149	54,561	72,458	84,541	95,304	107,063	117,242	127,962	136,454

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