August 8, 2003

Logistics

F/A-18E/F Integrated Readiness Support Teaming Program
(D-2003-120)

This special version of the report has been revised to omit contractor proprietary data.

Department of Defense
Office of the Inspector General

Quality *Integrity* *Accountability*

Additional Copies

To request additional copies of this report, contact Henry F. Kleinknecht at (703) 604-9324 (DSN 664-9324) or Patrick J. Nix at (703) 604-9332 (DSN 664-9332).

Suggestions for Future Audits

To suggest ideas for or to request future audits, contact the Audit Followup and Technical Support Directorate at (703) 604-8940 (DSN 664-8940) or fax (703) 604-8932. Ideas and requests can also be mailed to:

OAIG-AUD (ATTN: AFTS Audit Suggestions)
Inspector General of the Department of Defense
400 Army Navy Drive (Room 801)
Arlington, VA 22202-4704

Defense Hotline

To report fraud, waste, or abuse, contact the Defense Hotline by calling (800) 424-9098; by sending an electronic message to Hotline@dodig.osd.mil; or by writing to the Defense Hotline, The Pentagon, Washington, DC 20301-1900. The identity of each writer and caller is fully protected.

Acronyms

BCA	Business Case Analysis
FIRST	F/A-18E/F Integrated Readiness Support Teaming
GAO	General Accounting Office
LRIP	Low Rate Initial Production
NAVAIR	Naval Air Systems Command
NAVICP	Naval Inventory Control Point, Philadelphia
NSN	National Stock Number
NWCF	Navy Working Capital Fund
OEM	Original Equipment Manufacturer

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-4704

August 8, 2003

MEMORANDUM FOR NAVAL INSPECTOR GENERAL

SUBJECT: Report on F/A-18E/F Integrated Readiness Support Teaming Program (Report No. D-2003-120)

We are providing this report for review and comment. We considered management comments on a draft of this report when preparing the final report.

DoD Directive 7650.3 requires that all recommendations be resolved promptly. The Navy comments were nonresponsive. We request additional comments on Recommendations A.1., A.2., and B.1. through B.5. We request that the Navy provide comments by October 7, 2003.

If possible, please provide management comments in electronic format (Adobe Acrobat file only) to audcm@dodig.osd.mil. Copies of the management comments must contain the actual signature of the authorizing official. We cannot accept the / Signed / symbol in place of the actual signature. If you arrange to send classified comments electronically, they must be sent over the SECRET Internet Protocol Router Network (SIPRNET).

We appreciate the courtesies extended to the staff. Questions should be directed to Mr. Henry F. Kleinknecht at (703) 604-9324 (DSN 664-9324) or Mr. Patrick J. Nix at (703) 604-9332 (DSN 664-9332). See Appendix G for the report distribution. The team members are listed inside the back cover.

By direction of the Deputy Inspector General for Auditing:

Robert K. West

Robert K. West
Deputy Director
Contract Management Directorate

This special version of the report has been revised to omit contractor proprietary data.

Office of the Inspector General of the Department of Defense

Report No. D-2003-120 **August 8, 2003**
(Project No. D2001CF-0100)

F/A-18E/F Integrated Readiness Support Teaming Program

Executive Summary

Who Should Read This Report and Why? Senior acquisition, logistics, and supply managers should read this report. This report discusses an initiative with The Boeing Company (Boeing) to independently manage a total logistics support program for Navy F/A-18E/F peculiar aircraft components.

Background. In June 1999, the Naval Air Systems Command prepared a business case analysis outlining the benefits that DoD would derive from teaming with industry to obtain total logistics support for the F/A-18E/F aircraft, referred to as the F/A-18E/F Integrated Readiness Support Teaming (FIRST) Program. The business case analysis showed a 30-year cost avoidance of $1.4 billion that was based on a comparison of costs associated with the teaming initiative for seven major cost elements to those costs without the initiative. The Naval Air Systems Command used the business case to justify entering into a teaming arrangement with Boeing. However, lacking sufficient program funds for the effort, the Naval Air Systems Command requested that the Naval Inventory Control Point, Philadelphia (NAVICP) provide assistance through the Navy Working Capital Fund.

To provide assistance, NAVICP prepared its own business case analysis based on a 5-year period that addressed costs associated with the infrastructure and processes included in the supply support element. The Navy used the results of that business case analysis in combination with the first 5 years of savings shown in the Naval Air Systems Command business case analysis for the other integrated support elements to demonstrate compliance with the cost and benefits savings requirements of the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999, Public Law 105-261, October 17, 1998, section 346, as amended, and support for its award of the FIRST contract. The NAVICP business case showed that traditional in-house support would cost $887.1 million versus contractor support at $834.7 million, a difference of $52.4 million. The Naval Air Systems Command business case claimed an additional cost avoidance of $73.7 million. This review focused on the $126.1 million in combined savings the Navy claimed would result in the first 5 years of the FIRST Program and the subsequent contract awarded to Boeing on May 9, 2001, to implement the program. The contract was a cost-plus-incentive-fee contract with award fee provisions and had a target price of $218.7 million for the 2-year base period.

Results. Although the Navy attempted to embody the concepts of performance-based logistics in the FIRST contract, we question the costs used to support its business case, the performance achievements the Navy will actually obtain, and the metrics used to evaluate performance. The business case used to justify award of the FIRST contract for life-cycle support of the F/A-18E/F peculiar aircraft components overstated the cost of DoD performance. As a result, the savings the Navy claimed to support the contract award were incorrect. We calculate (using data not always available when the business case analysis was prepared) the NAVICP business case analysis actually showed a cost increase for the FIRST Program of $153 million and the Naval Air Systems Command savings were only $10.2 million. Thus, the corrected Navy business case analysis actually showed the FIRST Program cost $142.8 million more the first 5 years than for the traditional support.

Developing a methodology and issuing guidance for preparing a business case analysis and preparing a new business case analysis for the FIRST Program should determine whether the FIRST Program represents the best value for the Navy and whether exercising future contract options is appropriate (See finding A for the detailed recommendations).

The FIRST contract did not effectively implement the material management and reliability improvements the acquisition plan for the FIRST "performance-based" concept describes. As a result, NAVICP cannot achieve the 13-percent life-cycle cost reduction expected from the FIRST Program. In addition, FIRST Program infrastructure support costs were difficult to measure, and we calculate the Navy Working Capital Fund's portion of the FIRST Program infrastructure support costs (Boeing and Navy) was running about 77 percent (minimum) of spare part or repair cost versus the intended 34 percent. Finally, the Navy funded more than $54.4 million for inventory that it stores in the Boeing commercial warehouse to support the program, significantly reducing the performance burden on Boeing. Navy customers were also overcharged more than $12.1 million by the Navy Working Capital Fund for 114 parts reviewed. Establishing metrics and assessing Boeing's effectiveness at achieving the performance expected, tracking actual support costs as a percentage of material issued, determining whether the Navy Working Capital Fund's portion of Boeing support can be performed for the intended 34 percent, shifting responsibility for maintaining inventory to Boeing, eliminating all Navy-owned inventory, requiring Boeing to purchase all of the parts directly from the original equipment manufacturers, and charging customers prices based on actual costs should bring improvement to the shortcomings identified with the FIRST Program (See finding B for the detailed recommendations).

Management Comments and Audit Response. The Navy did not agree with either the findings or recommendations. Although the Navy did partially concur with some of the recommendations, the Navy comments were not responsive. The Navy believed it used an appropriate methodology to prepare its business case analysis for the FIRST Program and that the business case analysis initially used to justify award of the FIRST contract was fully supportable. A primary area of contention was that the Navy did not believe the traditional supply system could obtain both spares and repairs at the same prices Boeing was able to obtain under the FIRST contract. We found no reason the traditional supply system could not obtain the same or better prices that Boeing obtained under the FIRST contract. In addition, the FIRST acquisition plan states, "Even though spares prices are expected to be higher because of direct Boeing supply, these increases will be offset by the other cost benefits of FIRST." The Navy also commented that it did not need metrics for tracking repair cycle times and reliability improvements identified in the acquisition plan. However, the Navy identified the repair cycle time and reliability improvements as desired objectives needed to meet the estimated FIRST life-cycle cost reductions. The Navy did not agree to track infrastructure support costs as a percentage of actual material costs but did agree to charge customers prices based on actual costs. We fail to see how the Navy can do one without the other. The Navy agreed that Boeing should own "undelivered" consumable and repairable inventory under a firm-fixed-price contract but did not address the $54 million of Navy owned inventory in the Boeing warehouse. The Navy did not agree that Boeing should procure items from the original equipment manufacturers to avoid pass-through costs but failed to explain how the pyramiding of multiple burden and profit rates did not adversely impact overall FIRST Program costs. Accordingly, we request that the Navy provide additional comments on the final report by October 7, 2003. See the Findings section of the report for a discussion of the management comments on the recommendations, Appendix F for management comments on the findings and our audit response, and the Management Comments section of the report for the complete text of the comments.

Table of Contents

Executive Summary i

Background 1

Objectives 2

Discussions With Navy Management 3

Findings

A. Business Case Analysis for the Navy FIRST Program 4
B. Performance-Based Logistics Support Contract for the F/A-18E/F Aircraft 18

Appendixes

A. Scope and Methodology 29
Management Control Program Review 30
B. Prior Coverage 31
C. Index of Reviewed Parts 33
D. Analysis of In-house Prices for Parts Reviewed 38
E. Customer Overcharges 46
F. Management Comments on the Findings and Audit Response 52
G. Report Distribution 59

Management Comments

Department of the Navy 61

Background

This report discusses an initiative with The Boeing Company (Boeing) to independently manage a total logistics support program for the Navy F/A-18E/F peculiar aircraft components.

DoD Logistics Support Strategies. DoD calculated that annually it spends about $59 billion on logistics support to operate and sustain weapon systems. DoD indicated that by adopting improved logistics support practices, those costs could be reduced as much as 20 percent. The General Accounting Office (GAO) reported that, in response to DoD direction in FY 1998, the Services began implementing logistics support strategies that rely on the private sector to provide most of the support that the Government traditionally provided.

Navy Support Strategies. The Navy has undertaken a number of initiatives designed to transform its logistics infrastructure into a "lean, process-driven system where a single action by the customer activates a global network of sources that delivers best value products and services." Improved customer support and total life-cycle cost management (reliability, maintainability, availability, and affordability) are the basic business tenets for accomplishing the challenge. The Naval Inventory Control Point, Philadelphia (NAVICP) has established a "performance-based" logistics program to meet the Naval Supply Systems Command assigned goal for improving support, reducing infrastructure, and lowering the Navy's weapon systems cost of ownership. As of May 2002, the Navy had awarded 51 aviation performance-based logistics contracts under the program and had another 45 systems/items under evaluation.

Rising Aviation Spare Parts Prices. Over the last 2 years, GAO issued two reports[1] addressing the rising prices of Navy aviation spare parts. Specifically, GAO reported that the prices customers paid for Navy-managed parts had increased on average 12 percent from FY 1994 through FY 1999 and continued to rise on average 37 percent from FY 1999 through FY 2002 for three of the Navy's weapon systems, the H-53 helicopter, the F/A-18, and AV-8B aircraft and their engines. GAO further reported that its examination indicated higher material costs contributed to the price increases, but stated that its ability to determine the reasons for rising spare part costs was impaired because the Navy lacked an effective data system for collecting and analyzing information relevant to material cost and usage. GAO stated the pricing data used in its analysis, which was obtained from NAVICP, had not been verified or validated.

F/A-18E/F Aircraft. The E/F model of the F/A-18 aircraft has parts that are both peculiar and common to the A-D models. The Navy plans to buy a minimum of 548 F/A-18E/F aircraft through 2010. The current multiyear contract shows 288 aircraft are scheduled for delivery through FY 2006 and a total of 105 aircraft were delivered to the Navy through FY 2002. More than 1,200 A-D model

[1] GAO Report No. GAO-01-23, "Prices of Navy Aviation Spare Parts Have Increased," November 6, 2000, and GAO Report No. GAO-02-565 "Navy Needs Plan to Address Rising Prices in Aviation Parts," May 31, 2002.

F/A-18 aircraft are deployed with the Navy, Marine Corps, and foreign militaries. The earliest version of the aircraft first entered Navy service more than 17 years ago and is expected to remain in service for another 20 years.

The Naval Air Systems Command (NAVAIR) F/A-18 Program Office established an overall goal to reduce F/A-18E/F weapon system ownership costs by 20 percent and evaluated options for a total support solution that would achieve and sustain Chief of Naval Operations readiness goals. Specifically, the support solutions included meeting demand requirements of the operational, intermediate, and depot sites, as well as repairing and replacing the parts, including those parts returned for repair that are determined to be beyond repair. As part of the evaluation, NAVAIR performed a Trade Study Cost Analysis, dated July 1999, on a proposed teaming arrangement with Boeing, the aircraft prime manufacturer, referred to as the F/A-18E/F Integrated Readiness Support Teaming (FIRST) Program.

Program Establishment. On May 9, 2001, NAVICP awarded Boeing a 5-year requirements-type contract that established the Navy teaming arrangement with Boeing. The contract had a 2-year base period and included three successive 1-year ceiling priced options. The base period was a cost-plus-incentive-fee type contract with an award fee provision based on performance requirements. The target price for the base period was $218.7 million. [2] The contract covered procurement of initial and replenishment spares for 519 repairable parts and 5,856 consumable parts as well as repair of the repairable parts. In the option years, the contract converted into a fixed-price-incentive-fee contract with an award-fee provision. The bulk of the repair work for the F/A-18E/F aircraft will be performed at the Naval Aviation Depot, California (North Island), as a subcontractor to Boeing. The contract gives Boeing responsibility for the support process for parts that are peculiar to the F/A-18E/F aircraft including responsibility for meeting system demand requirements, improving system and parts reliability and availability, and managing obsolescence. Boeing also became the supply chain manager for those parts, performing all the material management functions, including forecasting, parts management, transportation, distribution, and warehousing. The Navy plans to expand the scope of contractor support in the later phases of the FIRST Program to all E/F parts, including those parts common to earlier F/A-18 models.

Objectives

The audit objective was to determine whether the cost savings, availability, and reliability data used in the business case analysis (BCA) the Navy prepared supported the decision to award a commercial contract to Boeing for life-cycle support of the F/A-18E/F aircraft. We also reviewed the management controls over the preparation of business case analyses used for supporting total logistics support decisions. See Appendix A for a discussion of the scope and methodology and Appendix B for prior coverage related to the objectives.

[2] This area of the report represents contractor proprietary data that has been deleted.

Discussions With Navy Management

NAVICP Discussions. A working draft of this audit report was formally staffed with NAVICP management on November 13, 2002, and March 12, 2003. NAVICP management and Inspector General of the Department of Defense (IG DoD) management could not reach agreement on various issues. The following issues were the most contentious.

NAVICP contended significant benefit is derived from dealing with 1 supplier (Boeing) versus more than 130 original equipment manufacturers (OEMs). While we agree dealing with one supplier is easier, we also believe that for such a benefit, pyramiding of burden and profit rates significantly increases the cost. NAVICP correctly recognized that fact in its acquisition plan. To illustrate, $1 million of material coming from an OEM can receive a [3] burden and profit factor from a Boeing supplier, not the OEM, and then also receive an additional 77-percent burden and profit factor from Boeing (includes Navy burden). [3] [4] The Defense Logistics Agency charges its customers burden rates ranging from 30 percent to 50 percent to supply parts that are procured from OEMs. Using the 50-percent factor, the Defense Logistics Agency could supply the part to the Navy customer for $1.5 million versus the FIRST Program cost [3]. About 30 percent of the parts in our review were supplied in that manner.

Because of Boeing's ability to fully integrate spare buys with production and leverage vendor prices, NAVICP contended its business case savings of $52.4 million was valid and that the traditional supply system could not obtain the same prices as Boeing. While we agree that isolated instances where Boeing's ability to integrate spare buys with production may have impacted prices, the majority of prices for the spare parts used in our analysis were not impacted by any integration with production. For example, Tables 5 and 6 show instances where the Navy business case price was clearly overstated and no impact for integrating spares buys took place. The OEM for the parts depicted in those instances uses a standard cost system for pricing spare parts that does not provide for economic order quantities. In both cases, the Navy was able to obtain small quantities of items directly from the OEM at prices significantly less than the Boeing price or the price used in the business case.

President's Management Agenda. As stated in the President's Management Agenda for FY 2002, "program proponents bear the burden of proof to demonstrate that the program they advocate actually accomplish their goals, and do so better than alternative ways of spending the same money. . . . Many agencies and programs lack rigorous data or evaluations to show that they work." We expect no less from the FIRST Program.

---

[3]This area of the report represents contractor proprietary data that has been deleted.

[4][The portion of Boeing's burden and profit factor attributed to the Boeing supplier was removed.]

A. Business Case Analysis for the Navy FIRST Program

The Navy BCA used to justify the award of the FIRST contract overstated the cost of DoD performance. That condition occurred because the Navy BCA used:

- unreliable data to calculate in-house consumable and repairable item prices;
- an outdated matrix to calculate in-house repair costs versus historical data from the naval depots;
- savings associated with NAVICP cost recovery rates for obsolescence and net loss not justified;
- cost avoidances NAVAIR claimed relating to integrated logistics support elements not fully supported or justified; and
- a nontraditional methodology to calculate the in-house cost of managing consumable items.

As a result, the $126.1 million savings (NAVICP, $52.4 million, and NAVAIR, $73.7 million) that the Navy claimed to support award of the FIRST contract was incorrect. The initial BCA met the savings requirements for entering into a prime vendor contract for depot-level maintenance that were established by the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999, Public Law 105-261, October 17, 1998, section 346. However, the benefits are now questionable. We calculate, using data not always available when the BCA was prepared, that the FIRST Program was costing $142.8 million more than traditional support for the first 5 years (NAVICP cost increase of $153 million and the NAVAIR savings were only $10.2 million).

Business Case Analyses

NAVAIR Business Case. In June 1999, NAVAIR prepared a BCA outlining the benefits that DoD would derive from teaming with industry to obtain total logistics support for the F/A-18E/F peculiar aircraft components. The BCA projected that the FIRST Program would:

- provide a total logistics cost avoidance of $1.4 billion over 30 years,
- reduce turnaround time from 60 days to 45 days on repairs, and
- increase aircraft reliability (flight time between unscheduled removals) by 10 percent.

The cost avoidance was based on analysis of seven major cost elements that compared costs with the FIRST initiative to those costs without the initiative. Of the seven elements, two elements-supply support and support equipment-represented about 75 percent of the total cost avoidance. The Navy used the BCA to justify entering into a 30-year teaming arrangement with Boeing. However, lacking sufficient program funds for the effort, NAVAIR requested that NAVICP provide assistance through the Navy Working Capital Fund (NWCF).

NAVICP Assistance. To provide assistance through the NWCF, NAVICP prepared its own BCA to determine whether award of a contract to Boeing was cost effective. NAVICP prepared a BCA based on a 5-year period that addressed costs associated with the supply support element. To facilitate the BCA preparation, NAVICP established an integrated process team with Navy and contractor technical experts. The team provided expertise in areas such as inventory management, contracting, repairs, engineering, and financial management. The NAVICP BCA showed a $55.4 million cost avoidance to the NWCF (later adjusted to $52.4 million) and supported entering into a teaming arrangement for the F/A-18E/F aircraft.

Congressional Notification. The Strom Thurmond National Defense Authorization Act for Fiscal Year 1999, Public Law 105-261, October 17, 1998, section 346, as amended, placed conditions on expansion of functions performed under prime vendor contracts for depot-level maintenance and repair.

> **Conditions on Expanded Use.** The Secretary of Defense or the Secretary of a military Department, as the case may be, may not enter into a prime vendor contract for depot-level maintenance and repair of a weapon system or other military equipment described in section 2464 (a) (3) of title 10, United States Code, before the end of the 30-day period beginning on the date on which the Secretary submits to Congress a report, specific to the proposed contract, that
>
> (1) describes the competitive procedures to be used to award the prime vendor contract;
>
> (2) contains an analysis of costs and benefits that demonstrates that use of the prime vendor contract will result in savings to the Government over the life of the contract;
>
> (3) contains an analysis of the extent to which the contract conforms to the requirements of section 2466 of title 10, United States Code; and
>
> (4) describes the measures taken to ensure that the contract does not violate the core logistics policies, requirements, and restrictions set forth in section 2464 of that title.

On April 3, 2001, the Acting Assistant Secretary of the Navy (Research, Development, and Acquisition) notified Congress of the Navy's intent to award Boeing a contract for total logistics support of the F/A-18E/F aircraft. The Assistant Secretary stated that the Navy expected the contract would save the NWCF about $55.4 million (later adjusted to $52.4) over 5 years. In addition, the Navy also claimed $74 million in cost avoidance relating to other integrated logistics support elements from the FIRST Program from the NAVAIR BCA for the same period.

Reported FIRST Program Savings. Prior to contract award, NAVICP reduced from $55.4 million to $52.4 million its NWCF cost avoidance relating to the FIRST Program. Table 1 summarizes the Navy's reported 5-year $126.1 million cost avoidance relating to the FIRST contract with Boeing.

Table 1. FIRST Program Savings – Without Versus With FIRST
(in millions)

Description	Without FIRST	With FIRST	Cost Increase/ (Cost Avoidance)
NAVICP BCA			
Material costs	$ 779.0	$ 771.5	$ (7.5)
Operations cost	108.1	63.2	(44.9)
Subtotal NWCF cost	**$ 887.1**	**$ 834.7**	**$ (52.4)**
NAVAIR BCA			
Non-supply support elements	1,531.2	1,457.5	(73.7)
Total	**$2,418.3**	**$2,292.2**	**$(126.1)**

IG DoD-Calculated Performance Costs

The Navy BCA used to justify award of the FIRST contract overstated the cost of DoD performance by $268.9 million [$(126.1) minus $142.8=$268.9]. Our analysis of the BCA line item costs did not support the conclusion that the Navy would save $126.1 million over a 5-year period if NAVICP awarded the FIRST contract to Boeing. We questioned the reliability of the data and the methodology used in the BCA. Table 2 summarizes the adjustments made to the Navy's reported 5-year cost avoidance. Our calculations show the FIRST Program actually costs the Navy $142.8 million more than the traditional support method.

Table 2. IG DoD-Corrected FIRST Program Savings
(in millions)

Description	IG Corrected Without FIRST	IG Corrected With FIRST	Cost Increase/ (Cost Avoidance)
NAVICP BCA			
Material costs	$ 573.8	$ 783.1	$ 209.3
Operations cost	119.5	63.2	(56.3)
Subtotal NWCF Cost	**$ 693.3**	**$ 846.3**	**$ 153.0**
NAVAIR BCA			
Non-supply support elements	1,531.2	1,521.0	(10.2)
Total	**$2,224.5**	**$2,367.2**	**$ 142.8**

Table 3 shows the specific calculations and adjustments to the cost avoidance the Navy claimed.

Table 3. Summary of Audit Adjustments to Navy-Claimed Cost Avoidance

	Cost Increase/(Cost Avoidance)	
Navy-Claimed Cost Avoidance Related to:		
NAVICP - NWCF	**$ (52,391,565)**	
NAVAIR - Integrated Logistics Support		**$ (73,670,000)**
Audit-Calculated Additions:		
Consumable and Repairable Item Prices	$148,637,151	
Repair Costs	44,207,529	
FY 01-02 Obsolescence/Net Loss	11,644,746	
NAVAIR - Other Integrated Logistics		$ 63,500,000
Managing Consumable Items	66,416,831	
Other Audit Adjustments	4,499,510	
Audit-Calculated Reductions:		
DLA Recovery Rate on Consumables	$ (57,505,251)	
Failure to Apply Inflation to Consumables	(12,533,164)	
Error Correction on Consumables	(29,497)	
Total NAVICP Audit Adjustments	**$205,337,855**	
Total NAVAIR Audit Adjustments		**$ 63,500,000**
Total Cost Increase/(Cost Avoidance)	**$152,946,290**	**($10,170,000)**

Consumable and Repairable Item Prices

NAVICP used unreliable data to calculate the traditional (without FIRST Program) cost for consumable and repairable items. To establish more reliable data, we obtained sales histories and actual cost data from the OEMs. To establish the in-house BCA unit costs, NAVICP selected the most recent price paid for consumable and repairable parts from its contract status file. The NAVICP item managers responsible for pricing the parts stated their methodology disregarded BCA-projected demand and indicated that when historical pricing data were not available, which was often the case, the prices for alternate configurations or those developed from engineering calculations were used. In addition, NAVICP substituted Boeing's proposed bill of material price, which was based on a supplier price or proposal, for some prices. NAVICP added an 8-percent burden to the price when the proposed bill of material price was used because NAVICP felt the 8-percent burden made the price more reflective of the amount the Navy actually paid under traditional contracting methods. Parts pricing for the BCA occurred between October 2000 and March 2001.

Validity of BCA Prices. We evaluated prices for 76 consumable and 71 repairable parts with a total BCA cost of $345.7 million, representing about 67 percent of the total BCA in-house procurement cost of goods sold ($518.2 million) in our review. Table 4 shows that the in-house BCA prices were overstated by $148.6 million or 75.4 percent. Appendix C provides details on the parts reviewed, including National Stock Number (NSN), part number, contractor, and part description. Tables D-1 and D-2 in Appendix D provide details on our analysis of in-house BCA prices for the consumable and repairable parts.

Table 4. In-house BCA Price Versus Actual Supplier Price

	No.	Total Cost (BCA Demands)		Difference	
	Parts	BCA	Audit Calculated	Amount	Percent
Consumables	76	$157,778,507	$ 76,064,599	$ 81,713,908	107.4
Repairables	71	187,957,981	121,034,737	66,923,243	55.3
Total	**147**	**$345,736,488**	**$197,099,336***	**$148,637,151**	**75.4**

*Includes $29,845,498 reduction related to markup on parts purchased through the Northrop Grumman Corporation.

The supporting documentation for BCA pricing showed procurement history was available for only a limited number of the parts because the E/F aircraft was still early in production and only 54 aircraft had been delivered prior to contract award. Specifically, limited historical prices were available for only 10 of 76, or 13.2 percent, of the consumable parts and 37 of 71, or 52.1 percent, of the repairable parts reviewed. The lack of historical pricing information had a significant impact on the ability of NAVICP to establish a reasonable BCA price. For example, the BCA price for 49 of the 76 consumable parts reviewed was more than 100 percent higher than the audit-verified price. Historical pricing was not available on 46 of the 49 parts. The BCA price for 36 of the 71 repairable parts reviewed was more than 50 percent higher than the audit-calculated price. Historical pricing was not available on 26 of the 36 parts.

Best Available Data and Pass-Through Costs. NAVICP did not always use the best available data to establish BCA prices and did not effectively evaluate pricing data that included pass-through costs. For example, the BCA unit price of $142,616 for an electrical control box (NSN 1660-01-454-5712) was based on the price NAVAIR paid to Boeing under its low rate initial production (LRIP) contract. However, based on negotiations using certified cost or pricing data, NAVICP more recently purchased the part from the OEM at a significantly lower price of $54,777. Under FIRST, Boeing paid Northrop Grumman [5] for the part, which Northrop Grumman purchased from the OEM at an average price of [5] the true cost of the item.

[5]This area of the report represents contractor proprietary data that has been deleted.

Table 5 shows the price history for the electrical control box.

Table 5. Unit Price History for Electrical Control Box (NSN 1660-01-454-5712)

Order Date	Quantity	OEM Price	Calculated Boeing Cost[1]	BCA Price	Government Quantity	Government Price
8/13/1996	6	[6]	$126,395			
8/13/1996	2	[6]	125,300			
8/13/1996	6	[6]	126,395			
4/7/1997	3	[6]	126,395			
7/30/1997	20	[6]	115,049			
1/19/1998	3	[6]	115,049			
3/31/1998					3	$142,616[2]
9/9/1998	30	[6]	102,723			
4/29/1999					1	54,777[3]
2/3/2000	36	[6]	69,076			
10/26/2000	21	[6]	62,750			
10/26/2000	21	[6]	67,503			
2/1/2001				$142,616		
3/30/2001	5	[6]	67,503			
11/5/2001	1	[6]	58,864			
11/5/2001	45	[6]	58,864			

[1]OEM price plus Northrop Grumman pass-through markup of [6] .

[2]Boeing LRIP price to NAVAIR.

[3]OEM price to NAVICP.

Northrop Grumman supplied 44, or 29.9 percent, of the 147 parts in our review. However, Northrop Grumman was the actual OEM for only three of the parts. Northrop Grumman has an agreement with Boeing to provide all E/F-peculiar parts used in both the center and aft fuselage of the F/A-18 aircraft and assists Boeing with asset and configuration management of the parts. For the parts that it does not manufacture, Northrop Grumman buys parts from its suppliers, the OEMs, and provides the parts to Boeing at the OEM cost plus a Northrop Grumman average markup of [6] (based on actual costs through March 12, 2002). The NAVICP BCA never considered procuring the items directly from OEMs, including those items that the Navy procured from the OEMs prior to the FIRST contract. The oversight caused BCA costs to be overstated.

In another example, the Navy used a Boeing-provided price of $56,260 to establish the BCA price for a fluid pressure regulating valve (NSN 4810-01-469-1460). However, the Navy had purchased on February 24, 2000, the regulating valve from the OEM at a unit price of $20,000. Based on the BCA-projected demand of 77 parts, the price difference resulted in BCA costs being overstated by about $2.8 million.

[6]This area of the report represents contractor proprietary data that has been deleted.

Table 6 shows the price history for the fluid pressure regulating valve.

Table 6. Unit Price History for the Fluid Pressure Regulating Valve (NSN 4810-01-469-1460)

Order Date	Quantity	OEM Price	Calculated Boeing Cost[1]	BCA Price	Government Quantity	Government Price
7/30/1997	17	[7]	$25,658			
7/30/1997	6	[7]	25,658			
9/9/1998	60	[7]	22,970			
2/3/2000	72	[7]	31,602			
2/24/2000					12	$20,000[2]
10/26/2000	92	[7]	32,181			
2/1/2001				$56,260		
3/30/2001	15	[7]	31,631			
11/5/2001	6	[7]	32,497			
11/5/2001	90	[7]	32,497			

[1]OEM price plus Northrop Grumman markup of [7] .
[2]OEM price to NAVICP.

In another example, NAVICP used a BCA price of $17,536 each for an antenna (NSN 5985-01-455-2550) that was based on the price the Navy paid to Boeing under its LRIP contract. However, the price for the items from the OEM was [7] . Consequently, the BCA price was [7] higher than the OEM price. Table 7 shows the price history for the antenna.

Table 7. Unit Price History for Antenna (NSN 5985-01-455-2550)

Order Date	Quantity	OEM Price	Calculated Boeing Cost[1]	BCA Price	Government Quantity	Government Price
11/21/1997	24	[7]	$4,384			
3/31/1998					10	$17,536[2]
7/17/1998	10	[7]	3,911			
7/17/1998	40	[7]	3,911			
9/23/1999	60	[7]	3,358			
6/30/2000	72	[7]	3,331			
2/1/2001				$17,536		
4/18/2001	111	[7]	3,245			

[1]OEM price plus Northrop Grumman markup of [7] .
[2]Boeing LRIP price to NAVAIR.

[7]This area of the report represents contractor proprietary data that has been deleted.

The Navy needs to develop a methodology for calculating consumable and repairable item costs used in its BCA that considers the reliability of the data used for determining prices. Special consideration should be given to items with little or no procurement history, whether the item was procured directly from the OEM, economic order quantities, and high cost items.

Repair Costs

The Navy used an outdated matrix for calculating repair costs versus historical data for similar items available at the naval depots. The matrix, which NAVICP developed in 1986, was based on a study of actual repair costs on parts across all weapon systems that had procurements in the previous 2 years. The study compared the average repair cost of each part to its replacement (acquisition) cost and established percentages within certain replacement cost dollar thresholds that were used to calculate repair cost. NAVICP calculated the repair cost for each repairable item under the FIRST Program by applying the appropriate percentage, shown in Table 8, to the item's replacement cost. For example, if the acquisition cost for an item was $3,000, the repair cost would be $900 ($3,000 multiplied by .3 = $900).

Table 8. Repair Cost Matrix

Dollar Threshold	Percent
1 - 999	48
1,000 - 2,999	32
3,000 - 9,999	30
10,000 - 24,999	24
25,000 - 49,999	20
50,000 +	15

NAVICP stated that the matrix was updated in 1995 and that a number of parts was reviewed annually; however, we were unable to obtain any documentation to support the original study, the 1995 update, or any subsequent reviews.

Actual Repair Costs. We reviewed repair costs for 20 of 45 parts that either the OEM or depot repaired as of April 30, 2002. The total repair cost used in the BCA for the 20 parts was $65.6 million and for the 45 parts was $102.3 million. See Table D-3 in Appendix D for details on our analysis of BCA repair costs. The BCA repair costs were overstated because the matrix percentages were not accurate and the item acquisition costs were overstated. Our analysis of the 20 parts showed that BCA repair costs were overstated by $44.2 million, or 206.7 percent. We calculated that 117 percent of the difference was the result of inaccuracies in the matrix and 89.7 percent was the result of overstating the acquisition cost.

Historical Data From Depots. To calculate labor costs for parts the depot was expected to repair under the FIRST Program, Boeing obtained historical labor cost information for comparable F/A-18 C/D aircraft parts from the naval depot at

North Island. North Island identified comparable F/A-18 C/D aircraft parts and used historical labor costs for repairs to support its proposal to Boeing. Historical data were also available for material costs. We used the negotiated labor costs between North Island and Boeing (based on historical labor costs) and historical material costs to calculate repair costs for 8 of the 45 repairable parts in our review at North Island. North Island will perform the majority of the repair work under the FIRST Program. Our analysis showed that BCA repair costs were 112.9 percent higher than the repair costs calculated using data from North Island.

To validate the accuracy of its repair cost matrix, the Navy could have either used support from its depots to help develop the BCA repair costs for the C/D comparable parts or performed a study of repair parts on the F/A-18C/D aircraft using more current data. We believe the use of a generic repair cost matrix based on data from repair costs of components of various ages is questionable for new systems. The Navy should develop a methodology for calculating costs to repair repairable items used in its BCA that considers the reliability of the data used to determine prices. Special consideration should be given to items with little or no repair history and high cost items. In addition, the Navy should ensure that details of such studies and any subsequent updates are maintained as an audit trail, along with documentation of corresponding oversight performed.

Obsolescence and Net Loss

The BCA incorrectly claimed an $11.6 million cost avoidance for the costs associated with obsolescence and net loss on items procured during the 2-year base period of the FIRST contract. NAVICP recovers obsolescence, net loss, and other indirect costs by applying cost recovery rates to the NAVICP item acquisition cost. NAVICP used the FY 2001 Naval Supply Systems Command-calculated rates for quantifying the Government's cost to replace the FIRST Program items that would become obsolete or lost in inventory. Table 9 shows the amounts that the BCA determined the Government would expend for obsolescence and net loss over the life of the contract.

Table 9. Recovery Amounts for Obsolescence and Net Loss

	Obsolescence	Net Loss	Total
Year 1	$7,133,176	$281,112	$7,414,288
Year 2	3,260,651	969,807	4,230,458
Year 3	4,073,619	1,197,781	5,271,400
Year 4	4,157,760	1,190,425	5,348,185
Year 5	4,750,597	1,317,335	6,067,932
Total	**$23,375,803**	**$4,956,460**	**$28,332,263**

NAVICP did not assign any costs for obsolescence or net loss to the "With-FIRST" portion of its BCA because under the performance-based logistics concept Boeing assumed responsibility for managing obsolescence and net loss as

a part of providing total logistics support for the F/A-18E/F aircraft. However, the FIRST contract is a cost-plus-incentive-fee contract during the 2-year base period where the Navy procures the consumable and repairable items based on the BCA-determined demands from Boeing. The items are then stored at Boeing's commercial warehousing facility until issued to one of the Navy's operational, intermediate, or depot sites. Consequently, because the Navy owns the parts, the Navy will incur the cost of replacing any items that become obsolete or lost while in inventory. Using the Naval Supply Systems Command-calculated rates, the BCA showed that the Navy would not incur $7.4 million in year 1 and $4.2 million in year 2 of the contract for those costs if the FIRST Program were implemented. We have questioned only the costs associated with obsolescence and net loss on items procured during the 2-year base period of the contract as incorrect; however, if the Navy does not correct the situation for the option years of the contract, then the entire 5 years of the claimed cost savings of $28.3 million is questionable.

NAVAIR Integrated Logistics Support Elements

Cost Avoidance Claimed. The Navy claimed a $74 million cost avoidance relating to integrated logistics support element costs that were not fully supported or justified. The cost avoidance related to six of the seven cost elements that made up the original NAVAIR BCA. The seventh cost element, supply support, was addressed in the NAVICP BCA. Table 10 summarizes the other integrated logistics support costs the Navy claimed would be avoided by cost element during the 5-year period.

Table 10. Summary of Cost Avoidance
(in millions)

Cost Element	Cost Avoidance
Engineering	$ (4.76)
Integrated Logistics Support	6.01
Information Systems	(11.08)
Support Equipment	78.86*
Technical Publications	4.64
Training	0.00
Total	**$ 73.67**

*Supporting documentation showed $78.82 million.

Support Equipment. Support equipment represented the majority of the Navy's claimed cost avoidance related to integrated logistics support. Table 11 shows support equipment cost avoidance primarily related to hardware acquisition that consisted of four cost areas. We reviewed the methodology and supporting documentation for quantity discounts, major structural repairs, and tailored intermediate-level repairs and concluded that $63.5 million, the entire amount claimed for the three cost areas, was either invalid or questionable.

Table 11. Summary of Support Equipment (in millions)	
Cost Description	Cost Avoidance
Labor	$ 2.08
Hardware Acquisition	
Quantity Discounts	38.30
Major Structural Repairs	22.00
Tailored Intermediate-Level Repairs	3.20
No Shop Replacement Assembly Support	0.15
Maintenance	13.09
Total	**$78.82**

Quantity Discounts. The NAVAIR BCA concluded that quantity discounts of $38.3 million would be realized during FY 2001 through FY 2005 if an initial investment of $37.1 million was made in FY 2000 for required quantities of high dollar support equipment. The concept behind the discount related to the learning curve associated with manufacturing increased quantities. However, the quantity discounts initiative was never implemented, so no cost avoidance occurred. Also, the claimed cost avoidance never accounted for the initial $37.1 million investment.

Major Structural Repairs. The NAVAIR BCA concluded that a reduction in major structural repair equipment would result in a cost avoidance of $22 million during FY 2001 through FY 2005. To determine the cost avoidance, Navy and Boeing personnel reviewed the makeup of the support equipment bag (mix of various equipment) developed for repairs at the depot level for F/A-18 C/D aircraft. Based on experience with the F/A-18 C/D aircraft, technological advances, and discussions between Navy and contractor personnel, a decision to eliminate some of the larger equipment from the bag was made. The Navy analysis focused on the higher dollar alignment sets and fixtures. As a result of the analysis, the Navy claimed $22 million cost avoidance for the 5-year period by eliminating a portion of alignment sets and fixtures.

As an example of cost avoidance, the Navy determined that the repair capability for landing gear and canopy fixtures could be combined or dropped as a result of low usage on the existing F/A-18A/D aircraft program. In addition, Laser Alignment Systems are taking over the traditional design Mechanical Alignment Fixtures, resulting in fewer fixtures and tools having greater capability. However, NAVAIR could not distinguish reductions based on F/A-18 C/D experience and technological advances (not related to FIRST) from reductions that were a direct result of the Navy and contractor partnering relationship under FIRST. Therefore, while we agree with the Navy assessment that a cost avoidance was realized, we question how much, if any, can be attributed to the FIRST Program.

Tailored Intermediate-Level Repairs. The NAVAIR BCA attributed $3.2 million of the 5-year cost avoidance to the tailoring of intermediate-level repairs. This conclusion was based on the assumption that hardware acquisition at each repair site could be tailored to the needs of each aircraft. A site with more aircraft would therefore require more support equipment hardware acquisition. The tailoring decisions were based, in part, on the Navy's experience with the C/D aircraft. However, NAVAIR personnel responsible for cost analysis stated that without FIRST, the Navy would not have tailored the intermediate-level sites because each site would be funded equally. We believe that tailoring intermediate-level repairs to the needs per aircraft makes sense and the decision on whether to support the E/F aircraft using FIRST should not affect the Navy's use of experience on existing aircraft to make fiscally sound decisions.

Managing Consumable Items

To calculate the BCA cost of managing consumable parts without the FIRST Program, NAVICP used nontraditional methodology. DoD Manual 4140.26M, "Defense Integrated Materiel Management Manual for Consumable Items," May 1997, designates the Defense Logistics Agency as the integrated materiel manager for consumable items. Without the FIRST Program, the Defense Logistics Agency would have been responsible for managing the support of F/A-18E/F consumable parts and would have recovered in its recovery rate any associated costs for doing so. The cost recovery rate for the Defense Supply Center Richmond, the supply center that manages the majority of the F/A-18 aircraft parts, was 29.0 percent during 2002. The cost recovery rate includes costs for material issue and receipt, obsolescence, net loss, storage, and transportation. However, the Navy received a waiver from the Assistant Deputy Under Secretary of Defense for Supply Chain Integration, which allowed it to manage consumable parts under the FIRST contract.

The BCA methodology calculated issue and receipt costs by applying a composite rate to each transaction, defining a transaction as the demand for one unit using a baseline year cost of $24.36 per issue or receipt. The definition assumes that the Navy user would not order more than one item at a time, an assumption that increased the associated Defense Logistics Agency costs as well as the BCA-claimed cost avoidance. The BCA included costs of $20.4 million for material loss and obsolescence and $46 million for operations (includes issue and receipt, storage, and transportation), for a total of $66.4 million. We calculated a cost of $57.5 million for the Defense Logistics Agency to manage the consumables by applying the Defense Logistics Agency 2002 cost recovery rate of 29.0 percent to the revised cost of consumables. The Navy's methodology caused an overstatement of $8.9 million in the Defense Logistics Agency cost of managing consumable parts.

Other Audit Adjustments

We made additional adjustments to the BCA-claimed cost avoidance. Specifically, we reduced material maintenance costs on repairable parts by $4.6 million to reflect the audit-calculated reduction of spare and repair costs. In the BCA, such costs for obsolescence, net loss, and carcass loss were computed as a percentage of material cost. In addition, we added $12.5 million for the cost of inflation on consumable parts omitted from the BCA and $29,497 to correct a computation error.

Summary

The Navy did not have reliable data for preparing the BCA used in support of its decision to award the FIRST contract. Consequently, unreliable data were used to demonstrate that the use of the prime vendor contract for depot-level maintenance support resulted in savings to the Government, as Public Law 105-261, section 346 requires. Our calculations show the FIRST Program will cost the Navy an additional $142.8 million for the first 5 years of contract performance. Consequently, NAVICP needs to prepare a new business case for determining whether exercising future contract options are warranted and whether the FIRST Program provides the best value for the Navy and should continue.

Management Comments on the Finding and Audit Response

Summaries of management comments on the finding and our audit response are found in Appendix F.

Recommendations, Management Comments, and Audit Response

A.1. We recommend that the Commander, Naval Supply Systems Command develop a methodology and issue guidance for preparing business case analyses that consider the reliability of the data used to determine:

a. Consumable and repairable item prices with little or no procurement history, whether the item was procured directly from the original equipment manufacturer, economic order quantities, and high cost items.

b. Repair of repairable item prices with little or no repair history and high cost items.

Navy Comments. The Navy partially concurred, stating it actively used the existing decision tree methodology to determine the prices for consumable and repairable items under traditional Government support. The Navy also commented that the Repair Cost Matrix was an acceptable tool for determining repair prices.

Audit Response. The Navy comments are not responsive. The Navy's decision tree methodology used to determine prices for consumable and repairable items is unacceptable because it does not use and validate the actual OEM prices but relies on the contractor to establish the prices. In addition, the Repair Cost Matrix is only a tool for estimating the repair prices of new items and is not as accurate as other tools, such as actual repair costs for the same or similar items that should be used to validate the data. We request that the Navy reconsider its position on the recommendations and provide comments on the final report.

A.2. We recommend that the Commander, Naval Inventory Control Point, Philadelphia prepare a new business case that determines whether exercising future contract options is warranted and whether the FIRST Program provides the best value for the Navy and should continue.

Navy Comments. The Navy did not concur, stating that the BCA used for justifying the contract award was fully supported for the base period. The Navy further stated that although the BCA would be updated to reflect revisions for "with PBL" costs, in the absence of additional information to determine "without PBL" costs, a refreshed BCA should reach the same conclusion as the original cost projection.

Audit Response. The Navy comments are not responsive. The Navy BCA for the without performance-based logistics costs used unreliable data, failed to use actual OEM prices for consumable and repairable items, used an outdated matrix to calculate repair costs, and used inappropriate cost avoidances and savings. Fortunately, actual cost data are available for consumable and repairable items (OEM prices) and repair costs for the Navy to refresh its without performance-based logistics portion of the business case to validate or not the Navy's original cost calculations and decision to award the FIRST contract. We request that the Navy reconsider its position on the recommendations and provide comments on the final report.

B. Performance-Based Logistics Support Contract for the F/A-18E/F Aircraft

The Navy FIRST contract does not effectively implement the material management and reliability improvements described in the acquisition plan for the FIRST performance-based concept. Specifically, the FIRST contract failed to require Boeing, in conjunction with NAVICP, to:

- reduce repair cycle times and achieve a minimum 10-percent reliability improvement from baseline calculations,
- reduce and effectively monitor infrastructure support costs that included Navy inventory investment,
- procure items directly from the OEMs that reduced pass-through costs, and
- accurately charge fleet customers.

As a result, the 13-percent life-cycle cost reductions proposed in the acquisition plan appear questionable. We calculate that the NWCF portion of the FIRST Program infrastructure support costs was running about 77 percent (minimum) of spare part or repair cost versus the intended 34 percent. The Navy also funded about $54 million of inventory stored in the Boeing commercial warehouse, significantly reducing the performance burden; pass-through costs increased program costs by $5.1 million for applicable items; and Navy customers were overcharged $12.1 million by the NWCF for 114 parts issued to the fleet.

FIRST Acquisition Plan

In the Statement of Need section of its acquisition plan for the FIRST Program, NAVICP outlines shortcomings with the Navy's current method of aircraft support and identified why the alternative support approach envisioned under the FIRST Program was needed. Specifically, the section states:

> The current process of aircraft support is costly and unaffordable in today's funding environment. Dollars traditionally associated with support must be made available to address modernization efforts. The F/A-18 budget for logistics does not allow for execution to requirement at the current funding levels. The budget requirement was developed using the current organic process. This process affords relatively minor contractor participation and little Government-Industry teaming. This alternative support concept is required to streamline current processes and eliminate redundancies.

The Navy concluded that entering into a Government-Industry Partnership with Boeing serving as the single focus for contractual accountability and management

responsibility was needed to address the shortcomings with the current support process. Under the new process, Boeing would be responsible for supply support, engineering, and integrated logistics support of the F/A-18E/F along with continuous product improvement and modernization. Boeing would use the naval depots as the major providers of depot maintenance support services, supplemented by the OEMs when necessary. The acquisition plan also states that it was "the Navy's objective under this program for Boeing to retain ownership of wholesale inventories." The Capability or Performance section of the acquisition plan identifies improvements that were needed if the savings objective was to be realized. Specifically, the section states:

> In order to meet the desired objectives of FIRST and attain the estimated 13% LCC [life-cycle cost] reduction, the Government-Industry team must be able to reduce repair cycle time of failed components and achieve a minimum 10% reliability improvement from the baseline estimates. The repair cycle reduction will be facilitated by use of expedited transportation of material and guaranteed delivery of spare parts to support repair at the designated repair point. The minimum 10% reliability target will be achieved by analysis of parts usage, failure data and failure modes. This analysis will enable engineering changes to be effected for unreliable components as well as items facing material obsolescence.

Boeing would be provided financial incentives to be innovative and efficient and to reduce the total life-cycle cost of the F/A-18E/F aircraft. The Contractor Versus Government Performance section of the acquisition plan identifies the performance improvements that would be made under the FIRST Program. Specifically, the section states:

> FIRST makes use of best business practices through the teaming concept. Contracting with Boeing for total logistics support using a teaming approach is preferred in comparison to a traditionally organic process. FIRST will:
>
> - contractually guarantee a 10% reliability improvement,
> - avoid historical duplication of DoD/industry logistics effort,
> - introduce a fee based efficiency and reliability incentive,
> - lead to an estimated 13% cost reduction over the 30 years life cycle of the program,
> - reduce Government inventory investment, and
> - comply with the organic repair capability provisions of Title 10 U.S.C. [United States Code] sections 2460, 2464, and 2469.

Repair Cycle Times and Reliability Improvements

The Navy FIRST contract failed to require that Boeing reduce repair cycle times and achieve a minimum 10-percent reliability improvement from baseline calculations. NAVICP states in the acquisition plan that the higher prices expected to be paid for spares because of direct Boeing supply would be offset by the other FIRST Program cost benefits. NAVICP also states in the plan that 90 percent of the estimated savings were directly linked to the improvement in parts reliability and, as such, would be built into the process and guaranteed under the terms of the contract. Repair cycle time for failed components also needed to be reduced over the baseline estimates in order for the estimated 13-percent cost reduction to be realized.

Repair Cycle Times. The FIRST contract did not require that Boeing reduce repair cycle time for failed components. NAVAIR concluded F/A-18E/F support costs could be reduced if repair cycle times could be reduced from 60 to 45 days. However, NAVICP failed to establish a contract metric to address the reduction in the repair cycle time. NAVICP stated having a metric that motivated reductions in failed component repair cycle time was not needed because Boeing was required to supply material when needed. However, reducing repair cycle times from 60 to 45 days, or 25 percent, also reduces the assets needed to support the supply pipeline, or additional assets needed until repairs are complete. Consequently, NAVICP cannot reduce the pipeline assets (cost savings) without reducing the repair cycle time.

Reliability Improvements. The FIRST contract did not require that Boeing improve parts reliability by a minimum of 10 percent over baseline calculations. Supportability, the award fee metric NAVICP used to motivate Boeing to improve parts reliability, does not hold Boeing accountable for lowering parts failure rates by the minimum 10 percent needed to achieve the majority of the 13-percent cost reduction. The Navy did not use the data that its initial BCA expectations were based on to establish baselines that Boeing's performance could be measured against. Instead, the supportability metric measures Boeing's ability to identify, assess, and address trends in the performance of only a subset of fielded components when designated reliability threshold triggers are not met. Further, the Navy did not save the initial data for the reliability improvement metric, and the program, as designed, did not capture sufficient data that could document that Boeing support will improve reliability by 10 percent.

To achieve the savings addressed in its acquisition plan, the Navy needs to establish repair cycle time and reliability improvement metrics in the FIRST contract.

Infrastructure Support Costs and Inventory Investment

The FIRST Program has neither reduced nor effectively monitored infrastructure support costs, including the Navy's investment in inventory. NAVICP states, in its acquisition plan, that the FIRST Program would "avoid the historical duplication of DoD/industry logistics effort." The acquisition plan also states that

a NAVICP objective for Boeing is to retain ownership of wholesale inventories. However, the logistical infrastructure used to support the F/A-18E/F aircraft actually increased after program implementation and the type of contract vehicle the Navy chose for implementing the program prevented Boeing inventory ownership.

Reducing and Monitoring Support Costs. We calculated that the NWCF portion of FIRST Program infrastructure support costs were running about 77 percent (minimum) of spare part or repair costs. NAVICP proposed charging fleet customers 34 percent more than the cost of material or repairs to recover the NWCF portion of the Boeing support costs.[8] The proposed burden rate was comprised of 18.82 percent for the cost of Boeing's support, 4.57 percent for transportation costs, and 8 percent for the NAVICP cost recovery rate.

NAVICP has been able to offset most of the difference between the amount being recouped for Boeing support costs (18.82 percent) and the actual NWCF Boeing support costs (57.2 percent) because the burden rate was applied to the overstated part prices the Navy used in its BCA. Further, the way NAVICP structured the FIRST contract made calculating infrastructure support costs extremely difficult. For example, the cost of labor Boeing expended to manage the supply chain was billed as a direct cost rather than an indirect infrastructure support cost.

In addition, the 77-percent (minimum) infrastructure support cost recovery rate that we calculated for the FIRST Program is understated because the rate was based on total inventory costs. Traditionally, infrastructure cost recovery rates are applied to material issued to customers, not to total inventory costs. Thus, if only half of the parts purchased during our review were issued to customers, the burden rate for the NWCF would double. Table 12 shows our calculation of FIRST contract infrastructure support costs through March 25, 2002.

[8]The costs associated with in-service and information systems efforts, program management, and the support of spare parts prior to the material support dates are funded from NAVAIR appropriated funds.

Table 12. Total FIRST Contract Costs and Boeing Support Rates

Description	NAVAIR (APN[1] 1) Cost	NAVAIR (APN[1] 1) Percent	NAVAIR (APN[1] 6) Cost	NAVAIR (APN[1] 6) Percent	NAVICP (NWCF) Cost	NAVICP (NWCF) Percent	Overall Cost	Overall Percent
OEM Material Cost	**$ 367,767**		**$3,396,047**		**$40,427,892**		**$44,191,706**	
Boeing Support Cost								
9	9		9		9		9	
9	9		9		9		9	
9	9		9		9		9	
9	9		9		9		9	
9	9		9		9		9	
9	9		9		9		9	
9	9		9		9		9	
9	9		9		9		9	
9	9		9		9		9	
9	9		9		9		9	
9								
9	9	9	9	9	9	9	9	9
9	9	9	9	9	9	9	9	9
2 9	9	9	9	9	9	9	9	9
9	9	9	9	9	9	9	9	9
9	9		9		9	9	9	9
9	9		9		9		9	
NAVICP - Transportation Charge						**4.6[3]**		**4.6[3]**
NAVICP - Cost Recovery Rate						**8.0**		**8.0**
Burden Rate – Consumable (1.572 x (.0457 + .08 + 1) = 1.7696 – 1 = 76.96)						**77.0**		**92.0**
Burden Rate – Repairable ((1.572 x 1.0457) x 1.08 = 1.7753 – 1 = 77.53)						**77.5**		**92.7**

[1]APN is defined as Aircraft Procurement, Navy.
[2][This calculation assumes the award fee is proportionately paid from the different funding sources.]
[3] Figure rounded.

Consequently, the FIRST Program has not reduced infrastructure support costs. In fact, the Navy has actually expanded the logistical infrastructure that supports the F/A-18E/F aircraft under the program. For example, the Navy increased the number of organizations supporting the F/A-18E/F aircraft operating out of the Naval Air Station, Lemoore, California (Lemoore). Boeing supports the aircraft's

[9]This area of the report represents contractor proprietary data that has been deleted.

E/F-peculiar parts, while the Defense Logistics Agency as well as the Lemoore Aviation Support Group (the traditional DoD supply system) support the aircraft's common consumable and repairable components.

NAVICP needs to develop procedures that effectively track infrastructure support costs as a percentage of the actual cost of material issued to fleet customers for determining whether the FIRST Program can actually be performed for the intended 34 percent.

Navy Inventory Investment. The FIRST contract has not reduced inventory investment. We calculate that the Navy has funded about $54 million of inventory stored in the Boeing commercial warehouse, significantly reducing the performance burden on Boeing. Under the FIRST Program, Boeing purchases parts that support the program and submits bills to NAVICP as parts are delivered to the Boeing commercial warehouse in Torrance, California. Once the parts are issued, NAVICP is reimbursed for the parts from fleet customers. The Navy also pays Boeing about $4.0 million annually[10] to store the parts prior to their shipment to the fleet customers. That support approach requires that the Navy invest significant funds in inventory to meet customer demand, limits flexibility for meeting other requirements, and reduces the burden on Boeing for making decisions on inventory investment stock levels.

We had difficulty calculating the actual Boeing cost of the Navy inventory because neither NAVICP nor the Boeing-managed inventory system tracked the actual costs of the inventory. NAVICP only tracked the quantity of parts stored in inventory, and Boeing's system used only standard prices that were based on the previously described overstated Navy BCA prices. Further, Boeing was unable to provide the actual cost of Navy inventory stored in its commercial warehouse. Consequently, we needed to obtain actual cost data from the Boeing contracts group for the majority of the FIRST Program items and reconcile the data with the Boeing inventory system data. The process was burdensome and time consuming. Based on the results, we calculated that at the time of our review the Navy had somewhere in excess of $54 million of inventory in the Boeing commercial warehouse.

NAVICP needs to require that Boeing effectively track the cost of Navy inventory in the Boeing commercial warehouse and leverage proven commercial support concepts, shift responsibility to Boeing for maintaining inventory, and eliminate the Navy-owned inventory that has accumulated to support the FIRST Program.

Pass-Through Costs

The FIRST Program did not require that Boeing procure items directly from the OEMs. Northrop Grumman designed and manufactured the center and aft fuselage of the F/A-18 aircraft, and provides all parts used in that portion of the

[10]Rent charge was based on the cost associated with forecasted repairable and consumable transactions through FY 2002. In addition to rent, the monthly charge includes the costs incurred for the warehouse personnel, the associated general and administrative expenses, and other miscellaneous charges.

aircraft. Northrop Grumman also assists Boeing with asset and configuration management of the parts under its agreement with Boeing for the FIRST Program. In return, Boeing offers Northrop Grumman an opportunity to earn incentive and award fees similar to those the Navy offers Boeing. However, Northrop Grumman manufactured only 3 of the 44 Northrop Grumman parts reviewed and purchased the remaining 41 parts from the OEMs. Northrop Grumman added a markup of about [11]. As of March 2002, Northrop Grumman added about $5.1 million to the OEM price for parts that passed through Northrop Grumman. NAVICP needs to require that Boeing purchase parts directly from the OEMs to eliminate pass-through costs.

Fleet Customer Charges

NAVICP did not accurately charge its customers for the cost of procuring and repairing spare parts because customer prices were based on the inaccurate BCA prices and not actual costs. We calculated that fleet customers were overcharged more than $12.1 million by the NWCF for the 114 BCA items reviewed that had purchase and repair demand through August 14, 2002. Table 13 shows the overcharges to fleet customers.

Table 13. Fleet Customer Overcharges*

		Charges		Overcharges	
Part Type	Parts	NAVICP	Corrected	Amount	Percent
Consumables	50	$ 3,988,600	$ 1,662,885	$ 2,325,715	139.9
New Repairables	51	27,540,880	19,842,018	7,698,862	38.8
Repaired Repairables	13	4,984,061	2,883,613	2,100,448	72.8
Total	**114**	**$36,513,541**	**$24,388,516**	**$12,125,025**	**49.8**

*See Appendix E for the detailed comparisons.

For example, Lemoore was charged $23,399[12] on average for each antenna [11] purchased. However, NAVICP paid Boeing only $3,285 each for the antennas. After removing the Northrop Grumman markup and applying the FIRST Program's burden rate of [11] to recover support costs, Lemoore should have been charged only $2,442 to purchase each antenna. As a result, Lemoore was overcharged by $20,957, or 858.2 percent, for each antenna purchased. Through August 14, 2002, Lemoore was overcharged $502,968 by the NWCF for the 24 antennas purchased.

In another example, Lemoore was charged $21,971[5] on average for each repair of trailing edge flap servo cylinders [11]. However, NAVICP paid only $4,672[13] to repair each servo cylinder. Thus, after applying the FIRST Program's burden rate

[11]This area of the report represents contractor proprietary data that has been deleted.

[12]The amount of NAVICP charges in these examples differs from Appendix E because only Lemoore demand was used, not demand from the total population.

[13]Based on 26 repairs.

of [14] to recover support costs, Lemoore should have been charged only $6,269 to repair each servo cylinder. As a result, Lemoore was overcharged by $15,702, or 250.5 percent, for repair of each servo cylinder. Through August 14, 2002, Lemoore was overcharged $345,430 by the NWCF for the 22 servo cylinders it had repaired.

Reviewing Customer Charges. NAVICP had not reviewed the actual prices paid for individual parts and repairs under the FIRST contract. Focused solely on ensuring that Boeing achieved the contract target cost goal of $218.7 million, NAVICP contracting personnel performed limited reviews of summarized cost data that were provided to support the contract's total cost. NAVICP concluded that detailed reviews of contract invoices were unnecessary because the Defense Contract Audit Agency had approved the Boeing cost accounting system. As a result, NAVICP failed to detect that it was overcharging its customers.

NAVICP should have used either prices based on actual costs or the prices the Navy and Boeing agreed on in March 2001 to establish the contract's target cost. Had the Navy used the contract's target cost prices, the fleet would have been charged, on average, only 7.3 percent more than the actual cost of the parts and repairs for 62 of 115 parts.[15] For example, NAVICP established the fleet's price for each hydraulic transmission [14] using its BCA calculated cost of $191,750. However, in March 2001, the Navy agreed to pay $79,001 for each transmission, a difference of $112,749. Had NAVICP used the finalized price to establish the customer charges, the price used to derive the customer charges for the transmission would have been within 1 percent of the part's actual cost ($79,756). Through August 14, 2002, NAVICP customers purchased 11 hydraulic transmissions and were overcharged more than $1.2 million since contract inception (before applying cost recovery rates). Had the final negotiated prices been used to price individual parts, NAVICP customers clearly would have been charged more reasonable and accurate prices.

Correcting Customer Charges. NAVICP contracting personnel stated alpha pricing would be used to correct the pricing inaccuracies in the option years. In alpha pricing, a team of Government pricing personnel consisting of NAVICP contracting officers, price analysts, and representatives of the Defense Contract Audit Agency and the Defense Contract Management Agency meet with Boeing staff to negotiate prices based on the cost data contained in the Boeing cost accounting system. We agree that alpha pricing is a valuable tool in determining actual costs and should also help NAVICP in preparing its new BCA. NAVICP needs to take appropriate action to charge customers prices based on actual costs.

[14]This area of the report represents contractor proprietary data that has been deleted.

[15]Because of missing data, 53 parts were dropped from our analysis.

Conclusion

The concept for FIRST was envisioned as an improved way of providing total logistics support through a teaming arrangement between industry and DoD to reduce total ownership costs. Boeing was supposed to outperform traditional DoD support. The Navy claimed total program logistics savings of $126.1 million over a 5-year period for the FIRST Program. However, the benefits the Navy expected to result from the FIRST Program identified in the acquisition plan have failed to materialize as part of the contract. Consequently, we question how the Navy will achieve the intended benefits.

Management Comments on the Finding and Audit Response

Summaries of management comments on the finding and our audit response are found in Appendix F.

Recommendations, Management Comments, and Audit Response

B. We recommend that the Commander, Naval Inventory Control Point, Philadelphia:

1. Establish repair cycle time and reliability improvement metrics in the F/A-18E/F Integrated Readiness Support Teaming contract that achieve the savings addressed in its acquisition plan.

Navy Comments. The Navy did not concur, stating it chose not to measure repair turnaround time as a separate metric because it believed customer wait time and fill rates are the relevant metrics in a performance-based agreement. The Navy also stated that the 10-percent reliability growth was anticipated over the life-cycle of the program, not in a 2-year initial performance period. Further the Navy stated, "Moreover, the lack of an objective metric in no way invalidates the reliability improvements needed to assure program lifecycle goals are achieved."

Audit Response. The Navy comments are not responsive and contradict the acquisition plan. The acquisition plan states, "Even though spares prices are expected to be higher because of direct Boeing supply, these increases will be offset by the other cost benefits of FIRST." The acquisition plan identifies the other benefits of the FIRST Program and states that for the FIRST Program to meet the life-cycle cost reductions, the program "must be able to reduce repair cycle time of failed components and achieve a minimum 10 percent reliability improvement from the baseline estimates." We fail to see how the Navy can effectively measure reliability improvements without establishing a baseline and holding the contractor accountable for improvement unless it is a contractual requirement. We request that the Navy reconsider its position on the recommendation and provide comments on the final report.

2. Develop procedures that effectively track infrastructure support costs as a percentage of the actual cost of material issued to fleet customers and determine whether the F/A-18E/F Integrated Readiness Support Teaming Program can actually be performed for the 34 percent envisioned for the program.

Navy Comments. The Navy did not concur, stating that the audit misinterpreted the Navy burdening and the cost recovery rates applied to FIRST Program items. The Navy further stated that some elements that must be covered remain direct Navy costs and are reflected in the 34 percent while other elements are assumed by Boeing and are in the price Boeing charges the Navy. The 34 percent is applied to the Boeing price and was never intended to be a cap on total infrastructure costs but as an estimate of the Navy direct costs.

Audit Response. The Navy comments are not responsive. The recommendation addresses the need to determine FIRST Program true infrastructure support costs as a percentage of the material and repair costs to accurately charge Navy customers and effectively manage the program. Also, the methodology provides an effective way of determining exactly how much the FIRST Program is costing and provide an accurate metric for comparing the FIRST Program to traditional infrastructure support costs. We request that the Navy reconsider its position on the recommendation and provide comments on the final report.

3. Require that Boeing effectively track the cost of Navy inventory in the Boeing commercial warehouse and determine whether the F/A-18E/F Integrated Readiness Support Teaming Program will be able to leverage proven commercial support concepts and shift responsibility for maintaining inventory to Boeing to eliminate all of the Navy-owned inventory.

Navy Comments. The Navy partially concurred, stating the FIRST contract includes appropriate provisions for tracking the cost of Navy inventory at Boeing. The Navy concurred that Boeing should own undelivered consumable as well as repairable inventory and plans to shift responsibilities under a firm-fixed price contract.

Audit Response. Although the Navy partially concurred, we do not consider the comments responsive. The Boeing inventory system fails to meet generally accepted accounting principles because it does not track the initial cost of items. We fail to see how the Navy can accurately value its inventory in the Boeing warehouse or how Navy customers can accurately be charged for items without this initial cost information, a requirement for any inventory system. As to who owns wholesale level inventory, Boeing has parts availability requirements under the performance-based logistics initiative. Consequently, Boeing should be responsible for all wholesale level inventory, not the Navy. We request that the Navy reconsider its position on the recommendation and provide comments on the final report.

4. Require that Boeing purchase parts directly from the original equipment manufacturers to avoid pass-through costs.

Navy Comments. The Navy did not concur, stating the Navy is buying performance, not material. The Navy further stated that Boeing is responsible for selecting the providers that enable Boeing to meet performance and cost targets.

Audit Response. The Navy comments are not responsive. As previously stated, we believe a significant cost increase to the program exists by the pyramiding of burden and profit rates when items are not procured from the OEMs and that the Navy needs to consider these costs and not just performance. We request that the Navy reconsider its position on the recommendation and provide comments on the final report.

5. Initiate appropriate action to charge customers prices that are based on actual costs.

Navy Comments. The Navy concurred, acknowledging that prices should be updated to ensure customers are charged prices based on actual contract pricing information. The Navy stated actual FIRST Program prices will be incorporated into the FY 2004 Price Update.

Audit Response. Although the Navy concurred, we do not consider the comments responsive based on its comments to previous recommendations. The Navy did not agree that it will require Boeing to track actual inventory costs and did not agree to determine actual infrastructure support costs; consequently, the Navy has no means to accurately charge its customers. We request that the Navy reconsider its position on the recommendation and provide comments on the final report.

Appendix A. Scope and Methodology

We reviewed the BCAs NAVICP and NAVAIR prepared. We also reviewed the statement of work and terms and conditions of the FIRST cost-plus incentive fee contract with an award fee provision (N00383-01-D-0001H). The contract covered procurement of initial and replenishment spares for 519 repairable parts and 5,856 consumable parts as well as repairs of the repairable parts. The target price for the 2-year base period is $218.7 million. We reviewed the methodology and supporting documentation for predicted reliability and availability improvements under the FIRST Program and the Navy's plan for measuring those improvements. To assess the Navy's effectiveness at meeting its goal to reduce ownership costs, we reviewed invoices and Boeing's actual costs for spares procurement through March 25, 2002, and repairs requisitioned through April 19, 2002. To further assess the reasonableness of repair prices, we obtained North Island depot repair costs for F/A-18C/D comparable parts and actual costs for E/F repairs completed under the FIRST Program. In addition, we reviewed FY 2001 and FY 2002 cost recovery rates for the Defense Logistics Agency and the Naval Supply Systems Command and the methodology used for computing BCA material maintenance costs and other operations cost. We also reviewed FIRST Program inventory levels stored at the Boeing commercial warehouse.

To assess the reasonableness of the $52.4 million cost avoidance claimed in the NAVICP BCA, we compared supporting documentation for BCA in-house prices to the actual costs for procurement and repair of spare parts. Specifically, we reviewed NAVICP pricing methodology and the historical prices for procurement of 147 spare parts and repair of 45 parts with total BCA costs (price multiplied by 5-year demand) greater than $500,000. The selected items represented a total BCA cost (without escalation) of $448 million, 70 percent of the total $643.4 million cost of goods sold. We reviewed purchase orders and sales invoices for FY 2000 through FY 2001 on 133 parts from Boeing and 7 of its suppliers. To identify additional costs related to the FIRST Program, we also reviewed the terms and conditions of Boeing's contracts with those suppliers.

To assess the reasonableness of the $73.7 million cost avoidance based on NAVAIR BCA, we focused our review on the methodology and supporting documentation for support equipment, the cost element that represented a 5-year cost avoidance of $78.7 million.

We performed this audit from April 2001 through April 2003 in accordance with generally accepted government auditing standards.

Use of Computer-Processed Data. We relied on computer-processed data obtained from Boeing, Northrop Grumman, NAVICP, NAVAIR, the Defense Logistics Agency, and the Defense Operations Research and Resource Analysis Office to determine audit scope and analyze cost objectives. We also used procurement history data obtained from a commercial system. The computer-processed data and procurement history data were determined reliable based on a comparison to source documents and data output. Although we did not perform a formal reliability assessment of the computer-processed data, we determined that contract numbers, order dates, and amounts generally agreed with the information

in the computer-processed data. We also pulled hard copy contract files and compared them with computer-processed data. We did not find errors that would preclude the use of computer-processed data to meet the audit objectives or that would change the conclusions in the report.

GAO High-Risk Area. The GAO has identified several high-risk areas in DoD. This report provides coverage of the DoD Inventory Management high-risk area.

Management Control Program Review

DoD Directive 5010.38, "Management Control (MC) Program," August 26, 1996, and DoD Instruction 5010.40, "Management Control (MC) Program Procedures," August 28, 1996, require DoD organizations to implement a comprehensive system of management controls that provides reasonable assurance that programs are operating as intended and to evaluate the adequacy of the controls.

Scope of the Review of the Management Control Program. We reviewed the adequacy of Navy controls over the preparation of BCAs developed to support total logistics support decisions. Specifically, we reviewed the controls over the selection of potential candidates for alternative support approaches, and data integrity. We also reviewed management's self-evaluation applicable to those controls.

Adequacy of Management Controls. We identified material management control weaknesses with the preparation of BCAs as DoD Instruction 5010.40 defines. The controls over data integrity did not ensure that costs shown in BCAs were derived from reliable pricing data and sound judgments. The Assistant Secretary of the Navy (Research, Development, and Acquisition), who is responsible for acquisition policy, should have established the controls. The recommendations in this report, if implemented, will improve procedures for preparing BCAs. A copy of the report will be sent to the senior official in charge of management controls for the Office of the Assistant Secretary of the Navy (Research, Development, and Acquisition).

Adequacy of Management's Self-Evaluation. Navy officials identified the preparation of BCAs as a part of an assessable unit. Navy officials did not identify the specific material management control weaknesses identified by the audit because the Navy evaluation covered the whole performance-based logistics process and did not focus on the controls over the integrity of data used to prepare BCAs.

Appendix B. Prior Coverage

During the last 5 years, the General Accounting Office (GAO) has issued seven audit reports, and the IG DoD has issued nine audit reports that discuss prices in the Acquisition Reform environment or logistics support.

GAO

GAO Report No. GAO-02-565, "Defense Acquisitions: Navy Needs Plan to Address Rising Prices in Aviation Parts," May 31, 2002

GAO Report No. GAO-02-306, "Defense Logistics: Opportunities to Improve the Army's and the Navy's Decision-making Process for Weapons Systems Support," February 28, 2002

GAO Report No. GAO-01-618, "Defense Logistics: Air Force Lacks Data to Assess Contractor Logistics Support Approaches," September 7, 2001

GAO Report No. GAO-01-23, "Defense Acquisitions: Prices of Navy Aviation Spare Parts Have Increased," November 6, 2000

GAO Report No. GAO-01-22, "Defense Acquisitions: Price Trends for Defense Logistics Agency's Weapon System Parts," November 3, 2000

GAO Report No. GAO/NSIAD-00-123, "Defense Acquisitions: Prices of Marine Corps Spare Parts Have Increased," July 31, 2000

GAO Report No. NSIAD-99-90, "Contract Management: DoD Pricing of Commercial Items Needs Continued Emphasis," June 24, 1999

IG DoD

IG DoD Report No. D-2000-180, "Commercial Contract for Total Logistics Support of Aircraft Auxiliary Power Units," August 31, 2000

IG DoD Report No. D-2000-098, "Spare Parts and Logistics Support Procured on a Virtual Prime Vendor Contract," June 14, 2000*

IG DoD Report No. D-2000-099, "Procurement of the Propeller Blade Heaters for the C-130 and P-3 Aircraft," June 12, 2000*

* Only redacted versions of these reports will be available on the Internet at www.dodig.osd.mil/audit/reports. These reports relate to the series of reports discussed in the Executive Summary and elsewhere in this report.

IG DoD Report No. 99-218, "Sole-Source Noncommercial Spare Parts Orders on a Basic Ordering Agreement," October 12, 1999*

IG DoD Report No. 99-217, "Sole-Source Commercial Spare Parts Procured on a Requirements Type Contract," August 16, 1999*

IG DoD Report No. 99-026, "Commercial Spare Parts Purchased on a Corporate Contract," January 13, 1999*

IG DoD Report No. 98-088, "Sole-Source Prices for Commercial Catalog and Noncommercial Spare Parts," October 13, 1998*

IG DoD Report No. 98-064, "Commercial and Noncommercial Sole-Source Items Procured on Contract N000383-93-G-M111," June 24, 1998*

IG DoD Report No. 98-085, "Joint Audit Report: Joint Contracting for Depot Maintenance of Secondary Items," March 4, 1998*

Others

Naval Audit Service Report No. NAVAUDSVC P-7520.1, "Contractor Logistics Support at the Naval Air Systems Command," January 29, 2003

Defense Contract Audit Agency Report No. 3421-2000J22000107, "Specified Cost Elements of Cost Plus Incentive Fee (CPIF)/Cost Plus Award Fee (CPAF)/ Fixed Price Incentive (FPI) Proposal for F/A-18E/F Integrated Readiness Support Teaming (FIRST)," December 11, 2000

* Only redacted versions of these reports will be available on the Internet at www.dodig.osd.mil/audit/reports. These reports relate to the series of reports discussed in the Executive Summary and elsewhere in this report.

Appendix C. Index of Reviewed Parts

Index C-1. Consumable Parts

NSN	Part Number	OEM	Nomenclature
1560-01-461-7380	74A481700-2011	Boeing	Arresting Hook Point
1560-01-469-3160	74A345665-2006	Tradco Incorporated	Structural Bracket
1560-01-469-3258	74A345667-2001	ROC-AIRE Corporation	Structural Fitting
1560-01-469-3261	74A345665-2005	Tradco Incorporated	Structural Bracket
1560-01-476-1333	74B328220-211	Hartwell Corporation	Latch Switch
1560-01-480-9973	B93420-1	Moog	Sleeve Bushing
1560-01-481-0165	B87116-1	Moog	Accumulator Assembly
1560-01-481-9380	9M680-3B125	Fairchild Fastner Group	Aircraft Latch Assembly
1560-01-481-9405	8655646-1	Raytheon	Lower Shield
1560-01-481-9465	74A315102-1013	Boeing	Access Door Brace
1560-01-482-6068	8655646-3	Raytheon	Upper Shield
1560-01-495-9249	74A341654-2021	Danvo Machining Company	Sleeve Bushing
1620-01-477-5892	AE70102G	Aeroquip Corporation	Elbow Subassembly
1630-01-455-1474	2612805-497	Honeywell	Disc Brake Stator
1630-01-455-3724	2612801-629	Honeywell	Disc Brake Stator
1630-01-468-9461	2613985	Honeywell	Aircraft Heat Shield Wheel
1650-01-463-6947	74B680060-121	Valcor Engineering Corporation	Hydraulic Accumulator
1680-01-454-5035	74A675240-1003	Northrop Grumman	Cylinder Assembly
1680-01-475-8517	74A211162-2001	Numerical Control Support	Sleeve Bushing
1680-01-476-0159	74A430817-2001	Messier Dowty	Bracket Adapter
1680-01-476-0160	74A430808-1001	Messier Dowty	Outer Tube Assembly
1680-01-476-0174	74A430606-1001	Messier Dowty	Tube Support
1680-01-480-6436	3598000-3	Parker Hannifin	Flow Control Valve
1680-01-480-6460	3043122-1	Parker Hannifin	Manifold Flex Assembly
1680-01-481-7742	175239-01-01	Frontier Electronics	Circuit Card
1680-01-481-7754	175233-02-01	Frontier Electronics	Circuit Card
1680-01-485-5682	74A731330-2003	Austin Machine Company	Aft Pylon Fairing
1680-01-485-5688	74A731331-1003	Boeing	Aft Pylon Fairing
1680-01-485-5779	74A734111-1001	Boeing	Hook-Mechanism
1680-01-485-5782	74A734113-1001	Boeing	Lock Assembly Forward
1710-01-478-1528	74A430823-1003	Messier Dowty	Metal Tube Assembly
1710-01-478-1569	74A430615-1001	Messier Dowty	Lower Cam Assembly
1710-01-479-5611	7-2666-5	Dowty Yakima	Cylinder Assembly
1710-01-480-0449	74A430830-2003	Messier Dowty	Cam Adapter
2910-01-469-3475	2930025-103	Parker Hannifin	Poppet Valve
2915-01-454-6731	2930018-114	Parker Hannifin	Fuel Pressurizing Valve
2915-01-454-6734	2930018-115	Parker Hannifin	Pressurizing Valve/Fuel
2915-01-463-6955	5910769	Hamilton Sundstrand	Liquid Switch
2915-01-469-6202	74B508002-105	Senior Aerospace	Bellows Assembly
4320-01-467-5272	74B430604-101	Honeywell	Shaft Seal Assembly
4710-01-272-0491	74A731106-1001	Boeing	Metal Tube Assembly
4730-01-469-3478	74A588362-2007	Sonfarrel Incorporated	Strainer Fuel Tank
4810-01-455-3707	MC19710-5	M.C. Aerospace Corporation	Linear Valve
4820-01-454-5006	56-4900-1	Sweeney Engineering	Relief Valve
5310-01-472-4321	74B328237-105	Paul R. Briles Incorporated	Assembled Nut/Plain

NSN	Part Number	OEM	Nomenclature
5310-01-477-3958	74A430605-2005	Messier Dowty	Nut Gland
5315-01-455-1431	2611825	Honeywell	Machine Key
5315-01-455-3635	74A430609-2001	Messier Dowty	Hollow Pin
5325-01-462-2756	3M1250AC6-9	TPS Aviation	Turn Lock Stud Assembly
5330-01-477-3955	74B430603-107	Messier Dowty	Shaft Seal Assembly
5330-01-478-1574	74A430642-2001	Messier Dowty	Support Tube Ring
5330-01-478-1575	74A430657-2001	Messier Dowty	Lock Ring Retainer
5340-01-469-1641	74A430616-1009	Messier Dowty	Access Cover
5365-01-462-2701	74A120953-2001	TPS Aviation	Machine Thread Plug
5905-01-463-8585	818771-1	Hamilton Sundstrand	Thermal Resistor
5930-01-454-5713	814263-1	Hamilton Sundstrand	Press Switch
5930-01-468-1550	212-6101	Autek Systems	Electrical Contact Assembly
5985-01-455-2545	3380-8012-0008	M/A COM Incorporated	Antenna
5985-01-455-2550	3400-8006-0004	M/A COM Incorporated	Antenna
5985-01-455-2601	503-1001-105	Boeing	Antenna
5985-01-455-2602	503-1001-106	Boeing	Antenna
5995-01-469-2926	74A342681-1013	Northrop Grumman	Aircraft Cover Access
5998-01-465-8634	138040-9	Kaiser Electronics	Circuit Card
6240-01-140-0732	60-3203-3	Grimes Aerospace	Incandescent Lamp
6340-01-454-4015	93160080-117	DNE Technologies Incorporated	Ice Detector
6340-01-454-4016	93210010-000	DNE Technologies Incorporated	Ice Detector
6620-01-454-5717	814289-1	Hamilton Sundstrand	Pressure Indicator
6685-01-454-5715	814271-4	Hamilton Sundstrand	Ambient Sensor
6685-01-465-8638	MT97107449-1	Manufacturing Technologies	Transmitter
No NSN Available	74B330057-105	Norco Incorporated	Holder Assembly
No NSN Available	74B343605-111	Hartwell Corporation	Hinge
No NSN Available	74A731330-2001	Austin Machine Company	Aft Pylon Fairing
No NSN Available	74A345918-1001	A&D Precision Manufacturing	Plate Assembly
No NSN Available	74A345918-1002	A&D Precision Manufacturing	Plate Assembly
No NSN Available	74A345918-1003	A&D Precision Manufacturing	Plate Assembly
No NSN Available	74A345918-1004	A&D Precision Manufacturing	Plate Assembly

Index C-2. New Repairable Parts

NSN	Part Number	OEM	Nomenclature
1430-01-455-3659	791660-20	United Technologies	Computer-Signal Data Generator
1560-01-455-3637	74A430800-2013	Messier Dowty	Brace Subassembly
1560-01-455-4868	320-4-50162-103	Engineered Fabrics	Aircraft Fuel Tank
1560-01-468-4151	320-4-50160-105	Engineered Fabrics	Aircraft Fuel Tank
1560-01-468-9446	320-4-50163-105	Engineered Fabrics	Aircraft Fuel Tank
1560-01-478-8261	2741406-3-3	Moog	Hydraulic Servo Valve
1560-01-480-8207	349951-107	Parker	Hydraulic Manifold
1620-01-455-3604	74A400940-1003	BF Goodrich	Landing Gear Axle
1620-01-455-3645	74A430901-1007	Messier Dowty	Catapult Launch Bar
1620-01-463-6970	OMP4308-9	Ozone Industries	Aircraft Steering Unit
1620-01-466-8717	74A430600-1013	Messier Dowty	Cylinder and Piston
1620-01-470-8697	74A430804-1005	Messier Dowty	Landing Gear Piston
1620-01-470-8719	74A430602-1003	Messier Dowty	Landing Gear Piston
1630-01-455-1435	2611745-1	Honeywell	Landing Gear Wheel
1630-01-455-1442	2611992-3	Honeywell	Multiple Disk Brake
1630-01-455-1444	2611991-2	Honeywell	Landing Gear Wheel

NSN	Part Number	OEM	Nomenclature
1630-01-455-1476	2612802-620	Honeywell	Disc Brake Rotor
1630-01-455-1477	2612804-643	Honeywell	Disc Brake Stator
1650-01-455-2590	41010230-103	H.R. Textron	Servo Cylinder Assembly
1650-01-455-2591	41010260-106	H.R. Textron	Servo Cylinder Assembly
1650-01-455-3668	997706	Eaton Aerospace-Vickers	Pistons Axial Pump
1650-01-455-4490	3043000-3	Parker	Servo Cylinder
1650-01-469-1468	349900-1015	Parker	Servo Cylinder Assembly
1650-01-470-8721	349940-1011	Parker	Servo Cylinder
1660-01-454-5010	70207-000-1	Hughes-Treitler	Heat Exchanger
1660-01-454-5013	70207-000-2	Hughes-Treitler	Air to Air Heat Exchanger
1660-01-454-5048	814203-2	Hamilton Sundstrand	Air to Air Heat Exchanger
1660-01-454-5712	814237-2	Hamilton Sundstrand	Electric Control Box
1660-01-454-6710	814207-5	Hamilton Sundstrand	Aircraft Cooling Turbine
1660-01-454-8184	814209-2	Hamilton Sundstrand	Air to Air Heat Exchanger
1660-01-461-7291	814211-3	Hamilton Sundstrand	Air to Air Heat Exchanger
1680-01-455-2537	2741392-2-2	Moog	Electro-Mechanical Actuator
1680-01-455-3691	B87600-005	Moog	Electro-Mechanical Actuator
1680-01-475-8514	3043032-9	Parker	Hydraulic Manifold
1680-01-478-0510	210001-30	Frontier Electronics	Display Unit
1680-01-478-2049	2746300-5	Moog	Hydraulic Motor
1680-01-479-0975	74A326121-1008	Northrop Grumman	Aircraft Wing Spoiler
1680-01-479-1049	74A326121-1007	Northrop Grumman	Aircraft Wing Spoiler
1680-01-480-0498	138200-29	Kaiser Electronics	Interface Control
1680-01-483-0315	138050-19	Kaiser Electronics	Circuit Card Assembly
1710-01-478-1586	74A430601-1001	Messier-Dowty	Actuating Cylinder
1720-01-455-1420	2-7938-3	Dowty Decoto	Repeat Holdback Bar
2520-01-455-2528	2741152-2-1	Moog	Mechanical Transmission
2520-01-472-6137	2741434-3-4	Moog	Hydraulic Drive Unit
2840-01-463-6963	763871E	Hamilton Sundstrand	Accessory Gearbox
2925-01-455-2558	74B543001-101	Honeywell	Starter-Generator
2925-01-479-3620	FV29290G4	Smiths Aerospace	Electronic Component
2925-01-479-3745	FV29390G4	Smiths Aerospace	Electronic Component
2925-01-479-3778	FV29555G9	Smiths Aerospace	Electronic Component
4320-01-454-5041	758913D	Hamilton Sundstrand	Rotary Pump
4320-01-454-5082	2780302-1-2	Honeywell	Centrifuge Pump Unit
4320-01-455-2564	3920031-113	Parker Hannifin	Hydraulic Reservoir
4320-01-455-2588	3920035-113	Parker Hannifin	Hydraulic Reservoir
4810-01-455-3689	B79995-007	Moog	Direct Linear Valve
4810-01-469-1460	814201-7	Hamilton Sundstrand	Fluid Pressure Regulating Valve
5895-01-490-6729	1023353G-1	BAE Systems	Antenna Position
5895-01-490-6738	1023388G-1	BAE Systems	Radio Frequency Assembly
5998-01-296-0824	794656-6	United Technologies	Electronic Component
5998-01-465-8626	138140-9	Kaiser Electronics	Electronic Component
5998-01-465-8631	138090-9A	Kaiser Electronics	Circuit Card Assembly
5998-01-465-8633	138180-19A	Kaiser Electronics	Circuit Card Assembly
5998-01-465-8656	138130-9D	Kaiser Electronics	Circuit Card Assembly
5998-01-470-8683	FV29420G2	Smiths Aerospace	Electronic Component Assembly
5998-01-470-8685	FV29170G1	Smiths Aerospace	Electronic Component Assembly
6115-01-455-3692	FH30001G2	Smiths Aerospace	Generator
6115-01-470-8681	FH30000G5	Smiths Aerospace	Alternative Generator
6130-01-480-1870	105E7477G8	Lockheed Johnson City	Power Supply

NSN	Part Number	OEM	Nomenclature
6130-01-495-6214	063000-1	Goodrich Hella Aerospace	Power Supply
6240-01-473-2020	112443-001	Frontier Electronics	Lamp Assembly
6615-01-482-0902	111E9359G101	Lockheed Johnson City	Flight Control Computer
No NSN Available	138110-9	Kaiser Electronics	Circuit Card Assembly

Index C-3. Repaired Parts

NSN	Part Number	OEM	Nomenclature
1430-01-455-3659	791660-20	Hamilton Sunstrand	Computer-Signal Data Generator
1560-01-455-3637	74A430800-2013	Messier Dowty	Brace Subassembly
1560-01-461-7373	74A481001-2007	Boeing	Arresting Hook
1560-01-464-8849	74A172004-1002	Boeing	Aileron
1560-01-478-8261	2741406-3-3	Moog	Hydraulic Servo Valve
1560-01-480-8207	349951-107	Parker Hannifin	Hydraulic Manifold
1620-01-455-3645	74A430901-1007	Messier Dowty	Catapult Launch Bar
1620-01-463-6970	OMP4308-9	Ozone	Aircraft Steering Unit
1620-01-466-8717	74A430600-1013	Messier Dowty	Cylinder and Piston
1620-01-470-8719	74A430602-1003	Messier Dowty	Landing Gear Piston
1630-01-455-1442	2611992-3	Honeywell	Multiple Disk Brake
1630-01-455-1476	2612802-620	Honeywell	Disc Brake Rotor
1630-01-455-1477	2612804-643	Honeywell	Disc Brake, Stator
1650-01-455-2590	41010230-103	H.R. Textron Inc.	Servo Cylinder Assembly
1650-01-455-3668	997706	Northrop Grumman	Pistons Axial Pump
1650-01-455-4490	3043000-3	Parker Hannifin	Servo Cylinder
1650-01-469-1468	349900-1015	Parker Hannifin	Servo Cylinder Assembly
1660-01-454-6710	814207-5	Northrop Grumman	Aircraft Cooling Turbine
1660-01-454-8184	814209-2	Northrop Grumman	Air to Air Heat Exchanger
1680-01-455-2537	2741392-2-2	Moog	Electro-Mechanical Actuator
1680-01-455-3691	B87600-005	Moog	Electro-Mechanical Actuator
1680-01-477-4914	138000-29	Kaiser Electronics	Display Unit
1680-01-478-2049	2746300-5	Moog	Hydraulic Motor
1680-01-478-9813	74A211001-1017	Boeing	Horizontal Stabilizer
1680-01-479-0937	74A551800-1017	Boeing	Aircraft Fuel Tank
1680-01-480-0498	138200-29	Kaiser Electronics	Interface Control
1680-01-482-0835	138070-9	Kaiser Electronics	Circuit Card Assembly
1680-01-483-0315	138050-19	Kaiser Electronics	Circuit Card Assembly
1720-01-455-1420	2-7938-3	Dowty Decoto	Repeat Holdback Bar
2520-01-472-6137	2741434-3-4	Moog	Hydraulic Drive Unit
2840-01-463-6963	763871E	Northrop Grumman	Accessory Gearbox
4320-01-454-5041	758913D	Northrop Grumman	Rotary Pump
4320-01-454-5082	2780302-1-2	Honeywell	Pump Unit, Centrifugation
4320-01-455-2564	3920031-113	Parker	Hydraulic Reservoir
4320-01-455-2588	3920035-113	Parker	Hydraulic Reservoir
4810-01-469-1460	814201-7	Northrop Grumman	Fluid Pressure Regulating Valve
5998-01-296-0824	794656-6	Hamilton Sunstrand	Electronic Component
5998-01-465-8626	138140-9	Kaiser Electronics	Electronic Component
5998-01-465-8631	138090-9A	Kaiser Electronics	Circuit Card Assembly
6115-01-455-3692	FH30001G2	Smiths, Leland Division	Generator
6130-01-454-4025	063000-1	BF Goodrich	Power Supply
6615-01-482-0902	111E9359G101	BAE Johnson City	Flight Control Computer
No NSN Available	138110-9	Kaiser Electronics	Circuit Card Assembly

NSN	Part Number	OEM	Nomenclature
No NSN Available	74A350006-1023	Boeing	Moveable Canopy
No NSN Available	74A730401-1017	Boeing	Aircraft Pylon

Appendix D. Analysis of In-house Prices for Parts Reviewed

Table D-1. Consumable Parts

		BCA (Government) Prices		IG DoD Verified Prices		Difference	
NSN	5-Year Demand	Unit Price	Total Price	Unit Price	Total Price	Amount	Percent
[16]	1,632	$ 4,974.00	$ 8,117,568	$ 2,248.01[1]	$3,668,752	$4,448,816	121.3
[16]	713	833.51	594,293	31.75[3]	22,638	571,655	2525.2
[16]	2,781	833.51	2,317,991	330.30[3]	918,564	1,399,427	152.3
[16]	713	833.51	594,293	31.75[3]	22,638	571,655	2525.2
[16]	12,155	833.00	10,125,115	136.43[3]	1,658,307	8,466,808	510.6
[16]	239	10,355.56	2,474,979	4,195.00[3]	1,002,605	1,472,374	146.9
[16]	37	13,762.07	509,197	3,228.18[3]	119,443	389,754	326.3
[16]	2,785	350.00	974,750	159.87[2]	445,238	529,512	118.9
[16]	123	8,005.50	984,677	3,462.00[2]	425,826	558,851	131.2
[16]	1,908	1,360.22	2,595,300	1,202.07[1]	2,293,550	301,750	13.2
[16]	123	8,005.50	984,677	3,462.00[2]	425,826	558,851	131.2
[16]	336	1,583.00	531,888	5.57[3]	1,872	530,016	28320.1
[16]	1,545	394.58	609,626	352.58[2]	544,736	64,890	11.9
[16]	2,646	1,720.00	4,551,120	1,503.04[2]	3,977,044	574,076	14.4
[16]	2,646	1,731.02	4,580,279	1,522.66[2]	4,028,958	551,321	13.7
[16]	8,763	359.00	3,145,917	173.14[2]	1,517,226	1,628,691	107.3
[16]	69	19,845.00	1,369,305	16,637.60[3]	1,147,994	221,311	19.3
[16]	133	5,222.00	694,526	3,630.26[1]	482,825	211,701	43.8
[16]	3,870	216.00	835,920	10.55[1]	40,829	795,091	1947.4
[16]	781	1,053.81	823,026	329.82[2]	257,589	565,436	219.5
[16]	110	4,833.47	531,682	4,095.61[1]	450,517	81,165	18.0
[16]	404	11,235.91	4,539,308	4,052.24[2]	1,637,105	2,902,203	177.3

[16]This area of the report represents contractor proprietary data that has been deleted.

		BCA (Government) Prices		IG DoD Verified Prices		Difference	
NSN	5-Year Demand	Unit Price	Total Price	Unit Price	Total Price	Amount	Percent
[17]	131	$ 9,871.49	$1,293,165	$ 8,539.94[2]	$1,118,732	$ 174,433	15.6
[17]	360	7,741.29	2,786,864	5,301.95[2]	1,908,702	878,162	46.0
[17]	131	4,200.00	550,200	1,782.27[2]	233,477	316,723	135.7
[17]	391	5,800.00	2,267,800	3,494.04[2]	1,366,170	901,630	66.0
[17]	3,037	325.00	987,025	52.05[1]	158,076	828,949	524.4
[17]	6,025	325.00	1,958,125	139.61[1]	841,150	1,116,975	132.8
[17]	781	2,324.27	1,815,255	1,986.16[1]	1,551,191	264,064	17.0
[17]	781	1,250.00	976,250	200.10[1]	156,278	819,972	524.7
[17]	781	1,930.56	1,507,767	355.57[2]	277,700	1,230,067	442.9
[17]	404	1,389.09	561,192	502.34[2]	202,945	358,247	176.5
[17]	661	3,063.96	2,025,278	2,584.00[2]	1,708,024	317,254	18.6
[17]	781	771.91	602,862	258.78[2]	202,107	400,755	198.3
[17]	14	40,050.00	560,700	23,005.58[2]	322,078	238,622	74.1
[17]	175	3,523.00	616,525	2,844.39[3]	497,768	118,757	23.9
[17]	507	5,519.00	2,798,133	2,820.83[3]	1,430,161	1,367,972	95.7
[17]	1,625	2,330.00	3,786,250	1,104.66[3]	1,795,073	1,991,178	110.9
[17]	1,412	496.86	701,566	1,251.54[2]	1,767,174	(1,065,608)	(151.9)
[17]	1,556	498.46	775,604	67.31[2]	104,734	670,869	640.5
[17]	781	651.62	508,915	223.63[1]	174,655	334,260	191.4
[17]	339	2,470.00	837,330	49.47[3]	16,770	820,560	4892.9
[17]	28	30,939.84	866,316	17,202.00[2]	481,656	384,660	79.9
[17]	1,705	679.00	1,157,695	291.31[3]	496,684	661,011	133.1
[17]	704	833.51	586,791	38.74[3]	27,273	559,518	2051.5
[17]	68	11,230.00	763,640	2,766.84[2]	188,145	575,495	305.9
[17]	8,763	336.68	2,950,327	188.63[2]	1,652,965	1,297,362	78.5

[17]This area of the report represents contractor proprietary data that has been deleted.

		BCA (Government) Prices		IG DoD Verified Prices		Difference	
NSN	5-Year Demand	Unit Price	Total Price	Unit Price	Total Price	Amount	Percent
[18]	1,581	$ 1,181.26	$1,867,572	$ 864.14[2]	$1,366,205	$ 501,367	36.7
[18]	22,955	53.00	1,216,615	30.26[2]	694,618	521,997	75.1
[18]	1,556	6,228.31	9,691,250	1,089.85[2]	1,695,807	7,995,444	471.5
[18]	1,556	380.30	591,747	109.09[2]	169,744	422,003	248.6
[18]	404	1,428.07	576,940	578.45[2]	233,694	343,246	146.9
[18]	404	22,052.70	8,909,291	8,573.09[2]	3,463,528	5,445,763	157.2
[18]	12,715	113.50	1,443,153	0.84[2]	10,681	1,432,472	13411.9
[18]	389	4,140.00	1,610,460	374.43[3]	145,653	1,464,807	1005.7
[18]	209	6,600.00	1,379,400	1,082.00[3]	226,138	1,153,262	510.0
[18]	6,154	643.89	3,962,499	262.50[2]	1,615,425	2,347,074	145.3
[18]	196	7,632.00	1,495,872	7,734.45[2]	1,515,952	(20,080)	(1.3)
[18]	524	17,536.00	9,188,864	1,832.10[3]	960,020	8,228,844	857.2
[18]	47	52,608.96	2,472,621	48,711.99[1]	2,289,464	183,158	8.0
[18]	93	36,593.39	3,403,185	32,719.02[1]	3,042,869	360,316	11.8
[18]	98	18,982.00	1,860,236	7,233.16[1]	708,850	1,151,386	162.4
[18]	159	13,410.00	2,132,190	6,544.80[2]	1,040,623	1,091,567	104.9
[18]	2,670	222.22	593,327	82.76[2]	220,969	372,358	168.5
[18]	429	5,920.00	2,539,680	3,233.78[3]	1,387,292	1,152,388	83.1
[18]	429	5,920.00	2,539,680	1,555.34[3]	667,241	1,872,439	280.6
[18]	83	6,150.00	510,450	1,009.00[3]	83,747	426,703	509.5
[18]	268	7,827.00	2,097,636	1,681.83[3]	450,730	1,646,906	365.4
[18]	61	10,870.00	663,070	7,357.00[1]	448,777	214,293	47.8
[18]	3,037	325.00	987,025	48.66[1]	147,780	839,245	567.9
[18]	6,377	798.00	5,088,846	1,240.77[3]	7,912,390	(2,823,544)	(35.7)
[18]	1,804	832.00	1,500,928	814.82[1]	1,469,935	30,993	2.1

[18]This area of the report represents contractor proprietary data that has been deleted.

	BCA (Government) Prices			IG DoD Verified Prices		Difference	
NSN	5-Year Demand	Unit Price	Total Price	Unit Price	Total Price	Amount	Percent
[19]	820	$832.00	$ 682,240	$99.94[3]	$ 81,951	$ 600,289	732.5
[19]	820	832.00	682,240	98.92[3]	81,114	601,126	741.1
[19]	820	832.00	682,240	99.94[3]	81,951	600,289	732.5
[19]	820	832.00	682,240	99.61[3]	81,680	600,560	735.3
Total on 76 Items Reviewed			**$157,778,507**		**$76,064,599**	**$81,713,907**	**107.4**

[1]Prices the Navy and Boeing agreed to use to establish the contract's Total Target Cost (not actual prices paid).

[2]Actual prices paid by Boeing.

[3]Actual prices paid by Northrop Grumman Corporation.

[19]This area of the report represents contractor proprietary data that has been deleted.

Table D-2. Repairable Parts

		BCA (Government) Prices		IG DoD Verified Prices		Difference	
NSN	5-Year Demand	Unit Price	Total Price	Unit Price	Total Price	Amount	Percent
[20]	50	$ 88,685.00	$4,434,250	$ 93,520.00[2]	$4,676,000	$ (241,750)	(5.5)
[20]	33	107,247.18	3,539,157	72,870.41[1]	2,404,724	1,134,433	47.2
[20]	24	31,853.00	764,472	24,284.62[3]	582,831	181,641	31.2
[20]	13	39,392.00	512,096	15,552.30[3]	202,180	309,916	153.3
[20]	12	45,325.56	543,907	23,985.00[3]	287,820	256,087	89.0
[20]	86	22,756.00	1,957,016	24,661.69[2]	2,120,905	(163,889)	(8.4)
[20]	40	23,633.10	945,324	20,638.14[2]	825,526	119,798	14.5
[20]	47	13,125.00	616,875	11,579.54[2]	544,238	72,637	13.3
[20]	59	21,543.18	1,271,048	14,147.38[2]	834,695	436,352	52.3
[20]	44	40,576.75	1,785,377	30,190.91[2]	1,328,400	456,977	34.4
[20]	21	279,911.03	5,878,132	196,384.42[2]	4,124,073	1,754,059	42.5
[20]	19	133,360.00	2,533,840	27,753.46[2]	527,316	2,006,524	380.5
[20]	36	175,800.00	6,328,800	37,867.24[2]	1,363,221	4,965,579	364.3
[20]	330	5,524.62	1,823,125	4,521.00[2]	1,491,930	331,195	22.2
[20]	107	39,852.08	4,264,173	39,299.00[2]	4,204,993	59,180	1.4
[20]	254	9,484.68	2,409,109	9,116.00[2]	2,315,464	93,645	4.0
[20]	2,239	1,650.00	3,694,350	1,910.00[2]	4,276,490	(582,140)	(15.8)
[20]	1,796	1,400.00	2,514,400	1,630.00[2]	2,927,480	(413,080)	(16.4)
[20]	67	45,652.00	3,058,684	36,982.00[2]	2,477,794	580,890	23.4
[20]	46	40,926.00	1,882,596	36,518.00[2]	1,679,828	202,768	12.1
[20]	82	51,361.52	4,211,645	25,821.49[3]	2,117,362	2,094,283	98.9
[20]	131	139,000.00	18,209,000	97,149.26[2]	12,726,553	5,482,447	43.1
[20]	79	102,258.00	8,078,382	82,603.86[2]	6,525,705	1,552,677	23.8
[20]	11	48,343.00	531,773	27,114.69[2]	298,262	233,511	78.3

[20]This area of the report represents contractor proprietary data that has been deleted.

		BCA (Government) Prices		IG DoD Verified Prices		Difference	
NSN	5-Year Demand	Unit Price	Total Price	Unit Price	Total Price	Amount	Percent
[21]	32	$ 27,414.71	$ 877,271	$ 4,848.05[3]	$ 155,138	$ 722,133	465.5
[21]	32	27,414.71	877,271	4,843.67[3]	154,997	722,273	466.0
[21]	23	27,423.15	630,732	22,435.32[3]	516,012	114,720	22.2
[21]	19	142,616.39	2,709,711	38,259.63[3]	726,933	1,982,778	272.8
[21]	46	95,867.84	4,409,921	26,797.00[3]	1,232,662	3,177,259	257.8
[21]	24	91,080.00	2,185,920	22,428.73[3]	538,290	1,647,630	306.1
[21]	12	62,530.00	750,360	38,861.39[1]	466,337	284,023	60.9
[21]	132	25,004.00	3,300,528	20,692.00[2]	2,731,344	569,184	20.8
[21]	16	49,499.00	791,984	27,363.00[1]	437,808	354,176	80.9
[21]	10	65,016.00	650,160	58,875.54[1]	588,755	61,405	10.4
[21]	15	99,000.00	1,485,000	49,131.00[2]	736,965	748,035	101.5
[21]	38	43,610.00	1,657,180	30,371.00[2]	1,154,098	503,082	43.6
[21]	29	62,067.15	1,799,947	36,668.40[1]	1,063,384	736,564	69.3
[21]	29	62,067.15	1,799,947	36,648.87[1]	1,062,817	737,130	69.4
[21]	5	257,546.82	1,287,734	119,174.40[2]	595,872	691,862	116.1
[21]	120	30,299.00	3,635,880	20,875.00[1]	2,505,000	1,130,880	45.1
[21]	2	308,980.00	617,960	72,458.06[2]	144,916	473,044	326.4
[21]	49	16,624.55	814,603	20,180.00[2]	988,820	(174,217)	(21.4)
[21]	10	56,345.00	563,450	49,760.00[2]	497,600	65,850	13.2
[21]	46	191,750.00	8,820,500	79,756.00[2]	3,668,776	5,151,724	140.4
[21]	33	137,425.00	4,535,025	76,498.87[3]	2,524,463	2,010,562	79.6
[21]	60	26,710.00	1,602,600	21,252.07[3]	1,275,124	327,476	25.7
[21]	18	34,090.00	613,620	16,767.00[1]	301,806	311,814	103.3
[21]	31	41,290.00	1,279,990	16,767.00[1]	519,777	760,213	146.3
[21]	30	37,020.00	1,110,600	23,489.00[1]	704,670	405,930	57.6

[21]This area of the report represents contractor proprietary data that has been deleted.

NSN	5-Year Demand	BCA (Government) Prices Unit Price	BCA (Government) Prices Total Price	IG DoD Verified Prices Unit Price	IG DoD Verified Prices Total Price	Difference Amount	Difference Percent
[22]	65	$ 34,610.84	$ 2,249,705	$ 14,204.41[3]	$ 923,287	$ 1,326,418	143.7
[22]	14	97,760.00	1,368,640	30,000.00[2]	420,000	948,640	225.9
[22]	42	49,695.91	2,087,228	12,181.19[3]	511,610	1,575,618	308.0
[22]	65	52,224.18	3,394,572	12,766.73[3]	829,837	2,564,734	309.1
[22]	44	20,000.00	880,000	14,016.18[3]	616,712	263,288	42.7
[22]	77	56,260.00	4,332,020	17,749.53[3]	1,366,714	2,965,306	217.0
[22]	12	88,157.00	1,057,884	56,347.00[1]	676,164	381,720	56.5
[22]	18	41,658.86	749,859	33,703.00[2]	606,654	143,205	23.6
[22]	68	15,090.00	1,026,120	13,162.56[2]	895,054	131,066	14.6
[22]	331	21,327.00	7,059,237	18,080.95[2]	5,984,794	1,074,443	18.0
[22]	266	42,150.00	11,211,900	21,551.89[2]	5,732,803	5,479,097	95.6
[22]	38	16,570.00	629,660	8,651.20[2]	328,746	300,914	91.5
[22]	101	12,050.00	1,217,050	8,480.48[2]	856,528	360,522	42.1
[22]	123	4,390.00	539,970	3,000.00[2]	369,000	170,970	46.3
[22]	30	17,707.68	531,230	16,781.20[2]	503,436	27,794	5.5
[22]	38	256,560.00	9,749,280	229,937.00[2]	8,737,606	1,011,674	11.6
[22]	31	83,610.00	2,591,910	51,380.00[2]	1,592,780	999,130	62.7
[22]	37	16,983.00	628,371	7,870.00[1]	291,190	337,181	115.8
[22]	37	38,210.00	1,413,770	25,093.65[1]	928,465	485,305	52.3
[22]	29	19,681.00	570,749	16,415.00[2]	476,035	94,714	19.9
[22]	13	150,704.00	1,959,152	104,388.00[1]	1,357,044	602,108	44.4
[22]	75	28,190.00	2,114,250	11,655.00[1]	874,125	1,240,125	141.9
Total Based on 71 Items reviewed			**$187,957,981**		**$121,034,737**	**$66,923,243**	**55.3**

[1]Prices the Navy and Boeing agreed to use to establish the contract's Total Target Cost (not actual price paid).
[2]Actual prices paid by Boeing.
[3]Actual prices paid by Northrop Grumman.

[22]This area of the report represents contractor proprietary data that has been deleted.

Table D-3. Repair Costs

		BCA			Actual OEM		Difference	
NSN	5-Year Demand	Unit Repair Cost	Total Cost	Quantity	Avg Repair Cost	Total Cost	Amount	Percent
[23]	164	$13,302.75	$ 2,181,651	36	$ 7,756.68	$ 1,272,096	$ 909,555	71.5
[23]	109	8,115.35	884,573	9	3,778.76	411,885	472,688	114.8
[23]	77	41,986.65	3,232,972	1	10,515.41	809,687	2,423,286	299.3
[23]	176	7,970.42	1,402,794	17	14,845.18	2,612,752	(1,209,958)	(46.3)
[23]	123	9,130.40	1,123,039	4	5,620.34	691,302	431,737	62.5
[23]	200	7,704.23	1,540,846	1	1,311.30	262,260	1,278,586	487.5
[23]	514	20,850.00	10,716,900	37	4,672.90	2,401,871	8,315,029	346.2
[23]	217	15,338.70	3,328,498	26	4,671.72	1,013,763	2,314,735	228.3
[23]	469	5,000.80	2,345,375	1	6,246.00	2,929,374	(583,999)	(19.9)
[23]	362	55,120.95	19,953,784	9	5,477.71	1,982,931	17,970,853	906.3
[23]	105	8,722.00	915,810	1	2,463.00	258,615	657,195	254.1
[23]	59	38,632.02	2,279,289	6	3,878.67	228,842	2,050,448	896.0
[23]	219	3,989.89	873,786	5	1,078.20	236,126	637,660	270.1
[23]	66	28,762.50	1,898,325	14	12,036.19	794,389	1,103,936	139.0
[23]	39	14,664.00	571,896	2	3,944.00	153,816	418,080	271.8
[23]	199	7,833.63	1,558,892	8	1,268.56	252,443	1,306,448	517.5
[23]	141	3,621.60	510,646	4	1,783.80	251,516	259,130	103.0
[23]	532	5,118.48	2,723,031	1	2,968.00	1,578,976	1,144,055	72.5
[23]	104	38,484.00	4,002,336	54	28,141.67	2,926,734	1,075,602	36.8
[23]	157	22,605.60	3,549,079	6	2,016.67	316,617	3,232,462	1020.9
Total 20 Repairs			**$65,593,522**			**$21,385,992**	**$44,207,529**	**206.7**

[23]This area of the report represents contractor proprietary data that has been deleted.

Appendix E. Customer Overcharges

Table E-1. Consumable Parts

	NAVICP Charges			IG DoD Verified Prices				Difference	
NSN	Qty Billed	Avg Unit Price	Total Price	Unit Cost	CRR*	Unit Price	Total Price	Amount	Percent
[24]	9	$ 87.00	$ 783	[24]	[24]	$ 42.32	$ 381	$ 402	105.6
[24]	15	303.00	4,545	[24]	[24]	440.29	6,604	(2,059)	(45.3)
[24]	8	87.00	696	[24]	[24]	42.32	339	357	105.6
[24]	2	1,050.00	2,100	[24]	[24]	5,591.94	11,184	(9,084)	(432.6)
[24]	40	467.00	18,680	[24]	[24]	213.11	8,524	10,156	119.1
[24]	5	10,750.00	53,750	[24]	[24]	4,614.85	23,074	30,676	132.9
[24]	7	10,660.00	74,620	[24]	[24]	4,614.85	32,304	42,316	131.0
[24]	23	160.00	3,680	[24]	[24]	469.99	10,810	(7,130)	(193.7)
[24]	16	2,285.63	36,570	[24]	[24]	2,003.55	32,057	4,513	12.3
[24]	16	3,389.38	54,230	[24]	[24]	2,029.71	32,475	21,755	67.0
[24]	676	479.00	323,804	[24]	[24]	230.80	156,021	167,786	107.5
[24]	3	26,640.00	79,920	[24]	[24]	22,177.92	66,534	13,386	20.1
[24]	8	1,410.00	11,280	[24]	[24]	439.65	3,517	7,763	220.7
[24]	8	14,980.00	119,840	[24]	[24]	5,401.64	43,213	76,627	177.3
[24]	2	5,640.00	11,280	[24]	[24]	2,375.77	4,752	6,528	137.4
[24]	1	7,790.00	7,790	[24]	[24]	4,657.56	4,658	3,132	67.3
[24]	8	2,580.00	20,640	[24]	[24]	473.97	3,792	16,848	444.3
[24]	9	1,860.00	16,740	[24]	[24]	669.62	6,027	10,713	177.8
[24]	4	3,810.00	15,240	[24]	[24]	3,444.47	13,778	1,462	9.6
[24]	4	1,030.00	4,120	[24]	[24]	344.95	1,380	2,740	198.6
[24]	6	53,380.00	320,280	[24]	[24]	30,666.44	183,999	136,281	74.1
[24]	3	6,110.00	18,330	[24]	[24]	3,791.57	11,375	6,955	61.2
[24]	4	7,192.50	28,770	[24]	[24]	3,760.17	15,041	13,729	91.3

[24]This area of the report represents contractor proprietary data that has been deleted.

		NAVICP Charges		IG DoD Verified Prices				Difference	
NSN	Qty Billed	Avg Unit Price	Total Price	Unit Cost	CRR*	Unit Price	Total Price	Amount	Percent
[25]	16	$ 3,130.00	$ 50,080	[25]	[25]	$ 1,472.51	$ 23,560	$ 26,520	112.6
[25]	5	543.00	2,715	[25]	[25]	1,668.30	8,342	(5,627)	(67.5)
[25]	30	669.00	20,070	[25]	[25]	89.72	2,692	17,378	645.6
[25]	2	795.00	1,590	[25]	[25]	65.94	132	1,458	1105.6
[25]	12	41,520.00	498,240	[25]	[25]	22,930.27	275,163	223,077	81.1
[25]	16	912.00	14,592	[25]	[25]	388.32	6,213	8,379	134.9
[25]	8	74.00	592	[25]	[25]	51.64	413	179	43.3
[25]	2	14,970.00	29,940	[25]	[25]	3,688.20	7,376	22,564	305.9
[25]	715	452.00	323,180	[25]	[25]	251.44	179,780	143,398	79.8
[25]	16	1,590.00	25,440	[25]	[25]	1,151.90	18,430	7,010	38.0
[25]	792	72.00	57,024	[25]	[25]	40.34	31,949	25,077	78.5
[25]	17	8,300.00	141,100	[25]	[25]	1,452.77	24,697	116,403	471.3
[25]	29	507.00	14,703	[25]	[25]	145.42	4,217	10,486	248.7
[25]	8	1,910.00	15,280	[25]	[25]	771.07	6,169	9,111	147.7
[25]	4	29,390.00	117,560	[25]	[25]	11,427.93	45,712	71,848	157.2
[25]	113	153.00	17,289	[25]	[25]	1.12	127	17,162	13564.1
[25]	14	5,560.00	77,840	[25]	[25]	499.12	6,988	70,852	1014.0
[25]	7	8,391.43	58,740	[25]	[25]	1,442.31	10,096	48,644	481.8
[25]	2	865.00	1,730	[25]	[25]	349.91	700	1,030	147.2
[25]	7	10,038.57	70,270	[25]	[25]	10,310.02	72,170	(1,900)	(2.7)
[25]	35	23,443.43	820,520	[25]	[25]	2,442.19	85,477	735,043	859.9
[25]	7	7,296.00	51,072	[25]	[25]	8,724.22	61,070	(9,998)	(19.6)
[25]	198	287.20	56,866	[25]	[25]	110.32	21,843	35,022	160.3
[25]	12	7,528.33	90,340	[25]	[25]	4,310.63	51,728	38,612	74.7
[25]	9	8,001.04	72,009	[25]	[25]	2,073.27	18,659	53,350	285.9
[25]	2	8,260.00	16,520	[25]	[25]	1,345.00	2,690	13,830	514.1
[25]	11	10,510.00	115,610	[25]	[25]	2,241.88	24,661	90,949	368.8
Total 50 Items			**$3,988,600**				**$1,662,885**	**$2,325,715**	**139.9**

[25]This area of the report represents contractor proprietary data that has been deleted.

Table E-2. Repairable Parts

		NAVICP Charges			IG DoD Verified Prices			Difference	
NSN	Qty Billed	Avg Unit Price	Total Price	Unit Cost	CRR*	Unit Price	Total Price	Amount	Percent
[26]	16	$119,010.00	$1,904,160	[26]	[26]	$125,503.84	$2,008,061	$(103,901)	(5.5)
[26]	2	42,750.00	85,500	[26]	[26]	32,589.96	65,180	20,320	31.2
[26]	1	52,870.00	52,870	[26]	[26]	20,871.19	20,871	31,999	153.3
[26]	1	60,830.00	60,830	[26]	[26]	32,187.87	32,188	28,642	89.0
[26]	3	31,720.00	95,160	[26]	[26]	27,696.38	83,089	12,071	14.5
[26]	6	17,620.00	105,720	[26]	[26]	15,539.74	93,238	12,482	11.8
[26]	10	28,910.00	289,100	[26]	[26]	18,985.78	189,858	99,242	52.3
[26]	7	54,450.00	381,150	[26]	[26]	40,516.20	283,613	97,537	34.4
[26]	3	375,620.00	1,126,860	[26]	[26]	263,547.89	790,644	336,216	42.5
[26]	1	178,960.00	178,960	[26]	[26]	37,245.14	37,245	141,715	380.5
[26]	4	235,910.00	943,640	[26]	[26]	50,817.84	203,271	740,369	364.2
[26]	69	7,446.38	513,800	[26]	[26]	6,067.18	418,635	95,165	22.7
[26]	18	53,480.00	962,640	[26]	[26]	52,739.26	949,307	13,333	1.4
[26]	64	12,796.09	818,950	[26]	[26]	12,233.67	782,955	35,995	4.4
[26]	32	2,220.00	71,040	[26]	[26]	2,563.22	82,023	(10,983)	(15.5)
[26]	35	1,880.00	65,800	[26]	[26]	2,187.46	76,561	(10,761)	(16.4)
[26]	9	66,175.56	595,580	[26]	[26]	49,629.84	446,669	148,911	33.3
[26]	9	54,920.00	494,280	[26]	[26]	49,007.16	441,064	53,216	10.8
[26]	19	68,930.00	1,309,670	[26]	[26]	34,652.44	658,396	651,274	98.9
[26]	1	71,440.00	71,440	[26]	[26]	130,374.31	130,374	(58,934)	(82.5)
[26]	13	137,230.00	1,783,990	[26]	[26]	110,854.38	1,441,107	342,883	23.8
[26]	1	64,880.00	64,880	[26]	[26]	36,387.91	36,388	28,492	78.3

[26]This area of the report represents contractor proprietary data that has been deleted.

	NAVICP Charges			IG DoD Verified Prices				Difference	
NSN	Qty Billed	Avg Unit Price	Total Price	Unit Cost	CRR*	Unit Price	Total Price	Amount	Percent
[27]	3	$ 35,166.67	$ 105,500	[27]	[27]	$ 6,506.08	$ 19,518	$ 85,982	440.5
[27]	3	35,167.67	105,500	[27]	[27]	6,500.21	19,501	85,999	441.0
[27]	4	49,997.50	199,990	[27]	[27]	30,108.20	120,433	79,557	66.1
[27]	4	191,380.00	765,520	[27]	[27]	51,344.42	205,378	560,142	272.7
[27]	4	120,130.00	480,520	[27]	[27]	35,961.57	143,846	336,674	234.1
[27]	2	98,815.00	197,630	[27]	[27]	30,099.36	60,199	137,431	228.3
[27]	11	33,560.00	369,160	[27]	[27]	27,768.66	305,455	63,705	20.9
[27]	3	132,850.00	398,550	[27]	[27]	65,933.80	197,801	200,749	101.5
[27]	2	58,530.00	117,060	[27]	[27]	40,757.88	81,516	35,544	43.6
[27]	22	22,310.00	490,820	[27]	[27]	27,081.56	595,794	(104,974)	(21.4)
[27]	2	75,610.00	151,220	[27]	[27]	66,777.92	133,556	17,664	11.7
[27]	11	257,310.00	2,830,410	[27]	[27]	107,032.55	1,177,358	1,653,052	140.4
[27]	4	184,420.00	737,680	[27]	[27]	102,661.48	410,646	327,034	79.6
[27]	4	35,850.00	143,400	[27]	[27]	28,520.28	114,081	29,319	25.7
[27]	2	46,450.00	92,900	[27]	[27]	19,062.32	38,125	54,775	143.7
[27]	2	131,190.00	262,380	[27]	[27]	40,260.00	80,520	181,860	225.9
[27]	4	66,690.00	266,760	[27]	[27]	16,347.16	65,389	201,371	308.0
[27]	10	70,080.00	700,800	[27]	[27]	17,132.95	171,330	529,470	309.0
[27]	8	26,840.00	214,720	[27]	[27]	18,819.71	150,558	64,242	42.7
[27]	7	68,945.71	482,620	[27]	[27]	23,819.87	166,739	315,881	189.4
[27]	5	31,290.00	156,450	[27]	[27]	24,264.63	121,323	35,127	29.0
[27]	2	56,570.00	113,140	[27]	[27]	28,922.64	57,845	55,295	95.6
[27]	4	22,240.00	88,960	[27]	[27]	11,619.91	46,480	42,520	91.6

[27]This area of the report represents contractor proprietary data that has been deleted.

	NAVICP Charges			IG DoD Verified Prices				Difference	
NSN	Qty Billed	Avg Unit Price	Total Price	Unit Cost	CRR*	Unit Price	Total Price	Amount	Percent
[28]	1	$ 16,170.00	$ 16,170	[28]	[28]	$ 11,380.80	$ 11,381	$ 4,789	42.1
[28]	3	5,900.00	17,700	[28]	[28]	4,026.00	12,078	5,622	46.5
[28]	1	23,770.00	23,770	[28]	[28]	22,520.37	22,520	1,250	5.3
[28]	19	304,804.21	5,791,280	[28]	[28]	308,575.45	5,862,934	(71,654)	(1.2)
[28]	1	112,200.00	112,200	[28]	[28]	68,951.96	68,952	43,248	62.7
[28]	5	26,410.00	132,050	[28]	[28]	22,028.93	110,145	21,905	19.9
Total 51 Items			**$27,540,880**				**$19,842,018**	**$7,698,862**	**38.8**

[28]This area of the report represents contractor proprietary data that has been deleted.

Table E-3. Repair Costs

	NAVICP Charges				Actual Cost (OEMs & Naval Depot)				Difference	
NSN	Qty Billed	Avg Unit Price	Total Price	OEM Repairs	Avg Cost	NAVICP CRR*	Repair Price	Total Price	Amount	Percent
[29]	13	$17,860.00	$ 232,180	36	[29]	[29]	$10,409.46	$ 135,323	$ 96,857	71.6
[29]	10	12,420.60	124,206	9	[29]	[29]	5,071.10	50,711	73,495	144.9
[29]	3	86,422.67	259,268	1	[29]	[29]	14,111.68	42,335	216,933	512.4
[29]	15	13,651.80	204,777	17	[29]	[29]	19,922.23	298,833	(94,056)	(31.5)
[29]	3	23,768.00	71,304	4	[29]	[29]	7,542.50	22,627	48,677	215.1
[29]	10	15,108.80	151,088	1	[29]	[29]	1,759.76	17,598	133,490	758.6
[29]	23	21,910.78	503,948	26	[29]	[29]	6,269.45	144,197	359,751	249.5
[29]	1	6,720.00	6,720	1	[29]	[29]	8,382.13	8,382	(1,662)	(19.8)
[29]	17	40,841.18	694,300	14	[29]	[29]	16,152.57	274,594	419,706	152.8
[29]	4	19,680.00	78,720	2	[29]	[29]	5,292.85	21,171	57,549	271.8
[29]	5	10,520.00	52,600	8	[29]	[29]	1,702.41	8,512	44,088	517.9
[29]	51	4,491.18	229,050	4	[29]	[29]	2,393.86	122,087	106,963	87.6
[29]	46	51,650.00	2,375,900	54	[29]	[29]	37,766.12	1,737,242	638,658	36.8
13 Items			**$4,984,061**					**$2,883,613**	**$2,100,449**	**72.8**

*Cost Recovery Rate

[29]This area of the report represents contractor proprietary data that has been deleted.

Appendix F. Management Comments on the Findings and Audit Response

Navy Comments on Finding A

Implementation of Performance-Based Logistics. The Navy commented that the FY 2003-2007 Quadrennial Defense Review mandated implementation of performance-based logistics with appropriate metrics designed to improve Fleet readiness. The Navy stated that the performance-based logistics program is a critical focal point for improving support and reducing total ownership costs for Navy-managed weapons systems. The Navy also commented that when fully implemented, performance-based logistics allow the Navy to reduce inventory and provide increased component availability.

Audit Response. As stated in the President's Management Agenda, "program proponents bear the burden of proof to demonstrate that the program they advocate actually accomplish their goals, and do so better than alternative spending of the same money. . . . Many agencies and programs lack rigorous data or evaluations to show that they work." Unfortunately, the Navy has not shown that the FIRST Program will reduce total ownership costs; moreover, the FIRST Program appears to be significantly more costly than other alternatives. The Navy will be unable to effectively assess any inventory reductions or increased component availability until after the FIRST Program becomes a fully implemented performance-based logistics program where the contractor owns the inventory.

Business Case Analysis Decisions. The Navy stated that its business decisions for each performance-based logistics initiative are determined by a BCA designed to quantify and compare the benefits and costs the Navy would incur for both traditional and performance-based logistics support scenarios. A performance-based logistics contract is awarded if the BCA results in a return on investment of break-even or better in the NWCF-Supply Management.

Audit Response. As shown in Finding A, the Navy did not achieve a "break-even or better" in the NWCF-Supply Management.

Contractor Responsibility, Inventory Ownership, and Performance Metrics. The Navy commented that performance-based logistics transfer some of the Navy's risk by increasing contractor responsibility and that inventory ownership is considered in full performance-based logistics arrangements. However, contractors are not willing to assume that level of risk responsibility. The Navy also commented that performance-based logistics contracts require fewer metrics.

Audit Response. Performance-based logistics arrangements where the Navy owns the inventory leave most of the risk with the Navy, significantly diminishing any value the performance-based logistics initiative provides. The arrangements also do not provide an effective means of evaluating improvements in metrics such as fill rate and customer response time. The metrics are directly related to

the amount of on-hand inventory. Consequently, the Navy needs to consider not entering into other than full performance-based logistics arrangements that require the Navy to own the inventory.

Purchasing Traditional F/A E/F Inventory Levels. The Navy stated that through the FIRST contract, Naval Supply Systems Command avoided purchasing traditional inventory levels for repair turnaround time or production lead-time requirements and that the contractor is responsible for all warehousing, transportation, depot washout, net loss, obsolescence, carcass loss, and acquisition of all retail requirements.

Audit Response. The Navy has a cost contract with Boeing where it pays all the costs. The $54 million of Navy-owned inventory is used to meet repair turnaround times and production lead-time requirements. Further, any depot washout, net loss, obsolescence, or carcass loss of the Navy-owned inventory is a cost to the Navy.

Traditional Parts Contract. The Navy commented that the IG DoD conducted the audit as though FIRST was a traditional parts contract. As a result, the audit did not properly evaluate the BCA, which determined that the award of the performance-based logistics contract was more affordable than traditional contracts.

Audit Response. The without performance-based logistics portion of the BCA the Navy used for supporting its decision was prepared as though the parts were procured on traditional parts contracts. Accordingly, we followed the same approach when reviewing the BCA. The primary difference between our approach and the Navy's was the Navy used unreliable data for the without performance-based logistics portion of the BCA that significantly overstated traditional costs.

Vendors and Unreliable Data to Calculate Consumable and Repairable Item Prices. The Navy commented that under a traditional model, DoD would have awarded contracts with more than 130 vendors to support the program. The Navy also commented that the IG DoD assumed prices achieved under the FIRST Program could be achieved under a traditional contracting mode and that the audit provided no support for this critical assumption. The Navy further stated that Boeing was in a unique position for taking advantage of vendor production schedules and combining both production and spares requirements to obtain the lowest unit price.

Audit Response. While we agree that one supplier is easier to deal with, we also believe significant cost increases caused by the pyramiding of burden and profit rates are associated with this benefit. NAVICP correctly recognized that fact in its acquisition plan. To illustrate, $1 million of material coming from an OEM can receive a 79-percent burden and profit factor from a Boeing supplier, not the OEM, and then also receive [30] burden and profit factor from Boeing (includes Navy burden). In essence, the $1 million OEM price now costs the Navy customer [30] .Traditionally, the Defense Logistics Agency charges customers

[30]This area of the report represents contractor proprietary data that has been deleted.

burden rates that range from 30 to 50 percent to supply parts procured from OEMs. Using the 50-percent factor, the Defense Logistics Agency could supply a part to the Navy customer for $1.5 million versus the FIRST Program cost of [31]. About 30 percent of the parts in our review were supplied in that manner.

While we agree isolated instances may exist where Boeing's ability to integrate spare buys with production may have impacted prices, the majority of the spare parts prices in our analysis were not impacted by any integration with production. For example, Tables 5 and 6 show instances where the Navy price used in its business case was clearly overstated and there was no impact for integrating spares buys. The OEM uses a standard cost system when pricing spare parts that does not provide for economic order quantities. In both cases, the Navy was able to obtain small quantities of items directly from the OEM at prices significantly less than the Boeing price or the price used in the business case. We also provided the Navy with additional examples where the Defense Logistics Agency was procuring the same items from the OEM under a strategic supplier alliance at significantly lower prices than the Navy was obtaining the parts under the FIRST Program. For example, the Defense Logistics Agency procured NSN [31] and NSN [31] from the OEM at unit prices of $989.65 and $524.01, while the FIRST prices from Boeing for the same items were $1,500 and $1,400, respectively. No evidence existed that DoD contracting officers could not obtain the same or better prices than Boeing contracting officers.

Use of FIRST Prices. The Navy commented that it was inappropriate to use FIRST Program prices when determining traditional procurement costs.

Audit Response. During the audit, we visited OEMs to determine the costs for individual parts used in the BCA. The majority of the parts we reviewed were new F/A-18E/F aircraft items and had not been procured under traditional contracting methods. The parts were either procured under the aircraft development contracts or the FIRST Program. The OEMs visited indicated that DoD could obtain the same prices as Boeing.

Sampling Methodology and Removal of Items. The Navy stated that the audit limited its review to items with a 5-year extended procurement dollar value greater than $500,000, which resulted in a sample population of 80 consumables and 86 repairable items, only 1 percent of the approximate 15,000 different items covered under the FIRST Program. The Navy also questioned the removal of 19 items from our analysis.

Audit Response. The items reviewed in the audit represented 70 percent ($448 million) of the total cost of goods sold ($643.4 million) used in the BCA. The 19 items were removed during the audit because sufficient data that supported the prices were not available.

Repair Matrix. The Navy stated that the repair cost matrix is a tool used for new system repair price projections and did not agree that the actual repair prices and data available from the North Island Naval depot were more reliable. The Navy

[31]This area of the report represents contractor proprietary data that has been deleted.

stated that repair data associated with the F/A-18 C/D parts were less accurate than the repair matrix and cited three examples where limited nonrepair cost data were used to calculate repair prices.

Audit Response. The actual repair prices and data available from North Island were also tools for validating the accuracy of the repair prices derived from the repair matrix used in the BCA. Coincidently, Boeing used the data associated with the F/A-18 C/D aircraft to negotiate prices for F/A-18 E/F repairs performed by the Naval Aviation Depot. While the Navy cited examples where limited repair data were available, the Navy also failed to address those examples where larger numbers of repairs were performed and the repair costs were significantly less than those used in the BCA. The three examples where limited nonrepair cost data were used to calculate repair prices were removed.

Cost Recovery Rates for Obsolescence and Net Loss. The Navy commented that the FIRST contract clearly shows that obsolescence and net loss are responsibilities borne by Boeing. The Navy then states that because FIRST is initially a cost reimbursable contract, it is correct that Boeing will pass any costs for obsolescence and net loss to the Navy. The Navy also commented that Boeing used $957,000 to procure five items in order to mitigate risk of obsolescence.

Audit Response. The Navy remains responsible for all the costs associated with obsolescence and net loss until the Navy transfers ownership responsibility for inventory to Boeing. Parts purchased under FIRST that become obsolete or lost will be Navy parts and not Boeing parts. Boeing also stated that it did not include costs for obsolescence and net loss in its proposal for the base period. Consequently, the Navy's business case needs to equally reflect the costs for obsolescence and net loss. We agree that the $1 million identified in the report for items that became obsolete did not truly relate to obsolete items but more to items being procured for the life of the program. We removed the statement from the report.

NAVAIR Cost Avoidances. The Navy commented that the NAVAIR BCA included in the audit was not relevant to the FIRST contract.

Audit Response. The audit clearly segregated the data from the NAVICP and NAVAIR BCAs. We included the NAVAIR BCA data because it was included in the notification to Congress.

Nontraditional Methodology Used to Calculate the In-house Cost of Managing Consumable Items. The Navy contends that the savings relating to the in-house cost of managing consumable items relates to the incorrect procurement prices the IG DoD used.

Audit Response. As previously stated, we believe the audit used the correct procurement prices and therefore, the in-house cost of managing consumable items was overstated in the NAVICP BCA.

Navy Comments on Finding B

Failure to Reduce Repair Cycle Time and Achieve a Minimum 10-Percent Reliability Improvement. The Navy commented that the 10-percent reliability growth was anticipated over the program life-cycle, not in a 2-year initial performance period. Further, the lack of an objective metric in no way invalidates reliability improvements needed to assure program life-cycle goals are achieved. The Navy stated that the acquisition plan never anticipated a repair cycle time metric and basically that the reduction from 60-day organic to 45-day repair turnaround time was irrelevant on a performance-based contract. The Navy also stated that not removing the requirements from its acquisition plan was an "administrative shortfall."

Audit Response. The Navy stated in its acquisition plan that to meet the desired objectives of FIRST and attain the estimated 13-percent life-cycle cost reduction, the Government-industry team must be able to reduce repair cycle time of failed components and achieve a minimum 10-percent reliability improvement from baseline calculations. We fail to see how the Navy could achieve the desired objectives of FIRST and attain the 13-percent life-cycle cost reduction without establishing baseline metrics that measure performance and establishing the metrics as performance-based contractual requirements. Consequently, we believe the requirements were appropriate in the acquisition plan and should have been included in the FIRST contract.

Reduce and Effectively Monitor Infrastructure Support Costs. The Navy does not agree that it should develop procedures that track infrastructure costs as a percentage of actual cost of material because the Navy BCA determined FIRST was cost effective. The Navy also stated that controls that ensure costs are consistent with the BCA are in place. The Navy also commented that it did not understand the 77-percent infrastructure cost the IG DoD calculated.

Audit Response. We do not agree that the Navy used appropriate data to calculate its BCA and therefore, do not agree with the conclusion that FIRST is cost effective. Developing procedures that track support costs as a percentage of actual material costs is a standard way of effectively tracking and evaluating infrastructure support costs. We see little value to controls that ensure costs are consistent with the BCA because of the inaccuracy of the BCA. We explained our infrastructure cost calculation to the Navy on several occasions, shared data, and received no questions from Navy representatives relating to not understanding the methodology.

Navy Inventory Investment. The Navy commented that the IG DoD did not recognize the difference in costs/risk for a contractor to invest in high cost repairable inventories compared to the costs/risk for investment in consumable type materials. The Navy also commented that when the FIRST contract transitions to a firm-fixed-price contract any new material (consumables and repairables) manufactured and placed in Boeing's warehouse will be owned by Boeing until it is shipped to Navy customers. The Navy stated the audit did not address difficulties of contractor ownership of material in a repairable environment. The Navy also does not agree that funding $54 million of inventory

stored in the Boeing commercial warehouse significantly reduces the performance burden on Boeing.

Audit Response. We fully recognize that the cost/risk of repairable and consumable items inventories stored in the Boeing commercial warehouse rests with the Navy, the owner of the inventory. We agree that Boeing should own all inventory in its commercial warehouse when the contract transitions to firm-fixed price, and we recognize the difficulties of contractor ownership in a repairable environment. We also believe for the FIRST concept to be fully tested, Boeing must assume the cost/risk for inventory. As to the $54 million of Navy-owned inventory reducing the performance burden on Boeing, parts availability is directly related to inventory levels, so providing any Navy-owned inventory reduces the performance burden on the contractor. The goal of any performance-based contract is to shift to the contractor the responsibility for determining inventory levels and the associated cost/risk of owning inventory.

Procuring Items Directly From the OEM to Reduce Pass-Through Costs. The Navy believes that FIRST is not a parts contract and that it is Boeing's responsibility to determine sources of supply that enable Boeing to deliver performance and control costs.

Audit Response. We believe it is difficult to make a case that overall the FIRST contract is saving the Navy money when on an individual parts basis, the prices are significantly higher than those that would be paid to the OEMs. The use of a program integrator that procures items though a subsystem integrator, who in turn procures the items from the OEM, greatly increases individual parts costs. That situation is exactly why DoD developed the spare parts breakout program for procuring items directly from the OEMs.

Accurately Charge Fleet Customers. The Navy commented that costs will ultimately be spread across applicable items and that NAVICP will recover no more than the cost incurred under the contract.

Audit Response. NAVICP was unable to accurately charge fleet customers because the Boeing inventory system did not track actual costs to procure or repair items. We believe the Navy should charge its customers prices representative of the cost to procure, repair, manage, and supply the items to establish basic accountability for the FIRST program.

Management Controls. The Navy commented that the data used in the BCA were appropriately analyzed and reviewed.

Audit Response. The Navy basically used the "best available pricing data" to include Boeing estimates for the without FIRST portion of the BCA without any further analysis. The audit identified additional data available from the system integrator, the OEMs, and the depots that was significantly different from the data the Navy used. We believe the Navy needs to evaluate its "best available pricing data" to determine its accuracy before using data that support a BCA decision.

Addendum 1. The Navy commented that the audit report does not include examples of the FIRST Program benefits. The Navy provided examples relating

to allowance effectiveness, backorder burndown, total asset visibility, supportability, integrated supply support, and customer satisfaction. The Navy commented that the USS Abraham Lincoln deployed 4 months early and that its cruise was extended to nearly 10 months, which was unprecedented and both the USS Abraham Lincoln and the USS Nimitz exceeded the standard of excellence for carrier allowance effectiveness for range and depth. The Navy also provided comments from the Vice Chief of Naval Operations made in his March 2003 testimony before the House Armed Services Subcommittee on Readiness citing FIRST as a performance-based logistics success and noting supply availability for the F/A-18E/F was at 85 percent versus 62 percent for the F/A-18C/D aircraft and positive customer satisfaction.

Audit Response. The audit focused on the savings the Navy claimed in the BCA and the Navy's BCA did not quantify any of the FIRST program benefits in Addendum 1. Concerning the USS Abraham Lincoln and the USS Nimitz, the Navy previously commented that 15,234 requisitions were filled since May 2001 under FIRST. We found that DLA filled 80,524 requisitions during the same period and is also responsible for the success of the carriers. The Vice Chief of Naval Operations also commented in his March 2003 testimony that substantial investments made in spare parts " . . . has paid off in spades because the demonstrated readiness surge today of seven battle groups forward deployed and the readiness numbers look really good with those folks, I think is a clear indication of the payoff of the investment in parts." We believe that a fair availability comparison between the F/A-18E/F and the F/A-18C/D aircraft is difficult because of the significant differences in numbers and age of aircraft supported and because the FIRST contract is funded at 100 percent of requirements while traditional support for the F/A-18C/D is funded at less than 100 percent of requirements. We also believe it would be natural for customer feedback to be more positive for programs funded at 100 percent of the requirements versus programs funded at less than 100 percent.

Addendum 2. The Navy provided examples of prices used in the audit that came from the FIRST contract.

Audit Response. During the audit, we visited OEMs to determine the costs for individual parts used in the BCA. The majority of the parts we reviewed were new F/A-18E/F aircraft items and had not been procured under traditional contracting methods. Those parts were either procured under the aircraft development contracts or the FIRST contract. The OEMs visited indicated that DoD could obtain the same prices as Boeing.

Addendum 3. The Navy provided a decision tree on how to determine prices for the traditional Government support side of a BCA and stated the decision tree was a sound approach to determine prices.

Audit Response. The Navy's decision tree relies only on data readily available in Navy systems or from the contractor's proposed bill of materials without validating the reliability of the price, determining whether better data is available at the OEMs, or applying any learning curve associated with various phases under which the parts were procured.

Appendix G. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition, Technology, and Logistics
- Deputy Under Secretary of Defense (Logistics and Materiel Readiness)
  - Assistant Deputy Under Secretary of Defense (Logistics, Plans, and Programs)
- Director, Acquisition Initiatives
- Director, Defense Procurement and Acquisition Policy

Under Secretary of Defense (Comptroller)/Chief Financial Officer
- Deputy Chief Financial Officer
- Deputy Comptroller (Program/Budget)

Department of the Army

Auditor General, Department of the Army

Department of the Navy

Assistant Secretary of the Navy (Financial Management and Comptroller)
Assistant Secretary of the Navy (Manpower and Reserve Affairs)
Assistant Secretary of the Navy (Research, Development, and Acquisition)
Naval Inspector General
Auditor General, Department of the Navy
Commander, Naval Air Systems Command
- Commanding Officer, Naval Air Station, Lemoore
- Commanding Officer, Naval Aviation Depot, North Island

Commander, Naval Supply Systems Command
- Commander, Naval Inventory Control Point, Philadelphia

Department of the Air Force

Assistant Secretary of the Air Force (Financial Management and Comptroller)
Auditor General, Department of the Air Force

Other Defense Organizations

Director, Defense Contract Audit Agency
Director, Defense Contract Management Agency
Director, Defense Logistics Agency

Non-Defense Federal Organizations

Office of Management and Budget
Office of Federal Procurement Policy

Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
House Committee on Armed Services
House Committee on Government Reform
House Subcommittee on Government Efficiency and Financial Management, Committee on Government Reform
House Subcommittee on National Security, Emerging Threats, and International Relations, Committee on Government Reform
House Subcommittee on Technology, Information Policy, Intergovernmental Relations, and the Census, Committee on Government Reform

Department of the Navy Comments

DEPARTMENT OF THE NAVY
OFFICE OF THE ASSISTANT SECRETARY
RESEARCH, DEVELOPMENT AND ACQUISITION
1000 NAVY PENTAGON
WASHINGTON, DC 20350-1000

25 JUN 2003

MEMORANDUM FOR DEPARTMENT OF DEFENSE ASSISTANT INSPECTOR GENERAL FOR AUDITING

SUBJECT: DODIG DRAFT REPORT ON F/A-18E/F INTEGRATED READINESS SUPPORT TEAMING (FIRST) PROGRAM (PROJECT NO. D2001CF-0100)

Reference: Your memo of 10 April 2003

We reviewed your report forwarded by reference.

The Navy disagrees with the audit's findings that cite the Naval Supply Systems Command (NAVSUP) using unreliable data and incorrect pricing methodologies in developing the FIRST Business Case Analysis (BCA). The Navy maintains that Naval Inventory Control Point data and methodologies are reliable, and the BCA is fully supported. In finding B, the audit evaluated FIRST as a traditional support contract for parts. FIRST is a performance based contract with cost tied to delivery of material. The key metric in FIRST is material availability because it measures performance provided to the fleet. Furthermore, Navy disagrees with the recommendations to establish certain traditional contracting based metrics and require Boeing to purchase parts directly from the original equipment manufacturer.

Navy concurs with the recommendations to: develop and issue guidance for preparing business case analysis; update the BCA for each new contract option; track inventory at Boeing; update pricing and charging customers prices based on actual costs.

Performance Based Logistics offer a strategy for weapon system support employing logistics support in an integrated, affordable package. The Navy goal is to reduce the logistics footprint while optimizing fleet readiness.

Our detailed comments on the findings and the recommendations are provided in the attachment.

William M. Balderson
Deputy Assistant Secretary of the Navy,
Air Programs

Attachment:
1. Department of the Navy's Comments

cc:
NAVIG-4
NAVSUP (91F)
NAVAIR (09G)

DEPARTMENT OF THE NAVY REPLY
TO
DoD IG DRAFT AUDIT REPORT OF 10 APRIL 2003
ON
F/A-18E/F INTEGRATED READINESS SUPPORT TEAMING PROGRAM
(D2001CF-0100)

Navy General Comments:
The Fiscal Year 2003-2007 Quadrennial Defense Review (QDR) mandates implementation of Performance Based Logistics (PBL) with appropriate metrics designed to improve Fleet readiness. DoD Directive 5000.1 directs PBL strategies be developed and implemented optimizing total system availability while minimizing cost and logistics footprint. Navy's transformation of logistics is a process-driven system that delivers best value products and services, and measures PBL support using high-level metrics. Improved customer support and total life cycle cost management (reliability, maintainability, availability, and affordability) are basic business tenets. The PBL program is a critical focal point for improving support and reducing total ownership cost (TOC) for Navy-managed weapon systems. When fully implemented, PBLs allow Navy inventory reductions while providing increased component availability.

Navy business decisions for each PBL initiative are determined by a Business Case Analysis (BCA) designed to quantify and compare benefits and costs Navy would incur for both traditional and PBL support scenarios. A PBL contract is awarded if the BCA results a Return on Investment (ROI) of break-even or better in Navy Working Capital Fund-Supply Management (NWCF-SM). Under a traditional support system, Naval Supply Systems Command (NAVSUP) contracts solely for purchase and repair of spare parts. PBL contracts represent a change in basic business practices by transitioning from line-item parts contracts to performance-level contracts intended to improve customer support. PBLs transfer some of Navy's risk by increasing contractor responsibility. Inventory Ownership is considered in Full PBL arrangements, however contractors are not willing to assume this level of risk or responsibility.

From Navy's perspective, PBL contracts require fewer metrics than traditional supply support contracts. PBL metrics focus on direct impact to war-fighter readiness using two key PBL performance measurements; fill rate and customer response time. Traditional metrics such as repair turnaround time (RTAT) and production lead-time (PLT) are no longer significant in PBL arrangements as Navy's focus moves to bottom-line customer support. Navy is not concerned with how the contractor meets their performance requirements, as long as they provide the level of support the customer is paying for.

Assistant Secretary of the Navy Research, Development and Acquisition (ASN(RD&A)), advises NAVSUP to consider PBL support for all new and major programs, maximizing financial benefit by preventing costly investment in wholesale system spares. The F/A-18E/F Integrated Readiness Support Teaming (FIRST) Program is an example of a platform or program early in its life cycle. Through the FIRST contract, NAVSUP avoids purchasing traditional F/A-18E/F inventory levels for repair turnaround time (RTAT) or production lead-time (PLT) requirements. The contractor is responsible for all warehousing, CONUS transportation, depot washout, net loss, obsolescence, carcass loss, acquisition of all retail requirements, as well as meet specific performance metrics. FIRST exceeds ROI criteria and performance expectations. These points will be addressed throughout Navy's audit response in the following pages.

In summary, PBLs offer a strategy for weapon system support that employs logistics support in an integrated, affordable package. Navy goal is to reduce the logistics footprint while optimizing fleet readiness.

Finding A. Business Case Analysis for the Navy FIRST Program

The Navy BCA used to justify the award of the FIRST contract overstated the cost of Department of Defense (DoD) performance. This occurred because the Navy BCA used:

(1) Unreliable data to calculate in-house consumable and repairable item prices;
(2) An outdated matrix to calculate in-house repair costs versus historical data that were available from the Naval depots;
(3) Savings associated with Naval Inventory Control Point (NAVICP) cost recovery rates for obsolescence and net loss that were not justified;
(4) Cost avoidances claimed by Naval Air Systems Command (NAVAIR) relating to integrated logistics support elements that were not fully supported or justified; and
(5) A non-traditional methodology to calculate the in-house cost of managing consumable items.

As a result, the $126.1 million savings (NAVICP, $52.4 million, and NAVAIR, $73.7 million) that the Navy claimed to support award of the FIRST contract were incorrect. The initial BCA met the savings requirements needed to enter into a prime vendor contract for depot-level maintenance required by Public Law 105-261, section 346; however, the benefits are now questionable. We calculate, using data not always available when the BCA was prepared, that the FIRST Program was costing $144.9 million more than traditional support for the first five years (NAVICP cost increase of $155.1 million and the NAVAIR savings were only $10.2 million.).

DON comment: Navy does not concur.

FIRST is a Performance Based Logistics contract where the contractor provides total logistics support. This includes a number of elements: projection of Navy's needs, acquisition of parts and services, development and incorporation of reliability improvements, management of configuration and obsolescence, warehousing and transportation of parts, and data development and exchange with Navy. All effort for these elements is included in the contract price. The Office of the Inspector General of the Department of Defense (DoD IG) conducted this audit as if FIRST was a traditional parts contract. DoD IG focused on costs of parts and repairs, not on the Statement of Work in the contract. As a result, DoD IG did not properly evaluate NAVICP's Business Case Analysis (BCA), which determined the award of a PBL contract was more affordable than using individual, traditional contracts. DoD IG disregarded benefits inherent in allowing contractor control of numerous elements of the supply chain. Addendum 1 contains examples of some benefits of FIRST not addressed by the audit.

Specifically, the audit states that the Navy used:

(1) Unreliable data to calculate in-house consumable and repairable item prices. Navy does not concur. The audit's specific purpose was to analyze whether data used in the contracting activity's BCA supported the decision to award a commercial contract to Boeing, and to review management controls over BCA preparation.

The underlying cause of disparity between the NAVICP BCA and DoD IG analysis is the differing assumptions on the impact of commercial buying practices to the overall cost of the program. NAVICP developed a BCA based on methodology designed to estimate costs in a traditional environment, which would entail individual contracts with approximately 130 suppliers for thousands of components. NAVICP compared these costs to proposed FIRST costs. The FIRST program is a departure from a traditional approach where Boeing, the aircraft prime, is solely responsible for support of many elements, including unique components on the aircraft. Boeing is authorized maximum flexibility in employing commercial practices and leveraging production lines in a way that traditional support could not. DoD IG assumed prices achieved under FIRST could be achieved under a traditional contracting mode. DoD IG provided no documentation to support this critical assumption, although it serves as the basis for DoD IG's conclusion that Navy's BCA is incorrect.

Navy does not concur that prices achieved under FIRST would have been achieved in a traditional contracting mode for the following reasons:

- Under a traditional model, Government would have awarded contracts with over 130 vendors to support F/A-18E/F aircraft. Each contract would be negotiated and awarded separately as each item reached reorder point. The traditional Navy model does not integrate spares with new production.

- Under FIRST, Boeing plans orders for F/A-18E/F aircraft parts to production lines, not reorder points. In order to meet required aircraft manufacturing timelines, Boeing establishes comprehensive plans with all supporting vendors. Boeing is uniquely positioned to take advantage of vendor production schedules and combine both production and spares requirements to obtain the lowest unit price possible. Boeing can order parts concurrent with production schedules and emphasizes criticality of production concurrency to suppliers. As an example, Boeing leveraged their ability to combine with larger production quantities and purchased Up Front Control Displays (UFCDs) at $110K per unit under FIRST. NAVICP purchased them prior to FIRST award at a unit cost of $135K.

DoD IG made the assumption that prices obtained by NAVICP under traditional support would be the same as prices obtained under the FIRST contract. When asked why FIRST prices were used in its analysis, when clearly not representative of traditional support, DoD IG asserted that these prices would have been obtained by NAVICP under any scenario. However, DoD IG was unable to provide substantiation for this assertion.

In an attempt to understand DoD IG methodology used to verify traditional Government support (especially where no historical prices existed), NAVICP requested DOD IG provide documentation to support prices used in the "IG Verified Costs" columns of Tables D-1 and D-2 of the report. DoD IG offered NAVICP access to their data. Table D-2 back-up data was found by NAVICP for 38 of 71 repairable items reviewed in the final report. Analysis of this data shows prices used by DoD IG were obtained as a direct result of the FIRST contract, or a weighted average of FIRST and production prices, and not from traditional support contracts. Examples where prices are a direct result of the FIRST contract are contained in Addendum 2. The "audit verified price" was actually the price NAVICP was able to obtain under the FIRST PBL, or the price from a Boeing production contract. In other words, DoD IG was unable to verify the cost for items under traditional support and incorrectly

assumed Navy could obtain the same prices through traditional procurement methodology as obtained under FIRST.

In addition, the audit report acknowledges that, in preparing this draft, auditors used "data not always available when the BCA was prepared." Thus, DoD IG acknowledges information was used in the audit that could not have been used when preparing the BCA. More importantly, the information used by DoD IG was from the FIRST contract. Navy considers this inappropriate, as it compares FIRST to FIRST. This one incorrect assumption results in a flawed analysis.

Regarding sampling methodology, DoD IG limited a pricing review to items with a five-year extended procurement dollar value greater than $500,000. This resulted in a sample population of 80 consumable and 86 repairable items (166 total items). With approximately 15,000 different items covered under the FIRST PBL, the sample population represented only 1% of the total items within the scope of FIRST. All prior working drafts of the audit addressed this sample population of 166 items, and initial findings by DoD IG estimated that NAVICP had overstated prices by 64.6%. However, in the final draft report, DoD IG reduced the sample size to 76 consumable and 71 repairable items (147 total items). The removal of 19 items is not explained nor is the impact of their removal on the audit conclusion clear.

NAVICP BCA development is fully supported and yields most reasonable comparison of traditional program support in contrast to costs and benefits of the FIRST Program. Through coordination with its Headquarters, NAVICP used the best models available to create a prediction of traditional costs. The audit significantly understates costs that would have resulted from Navy awarding separate contracts to over 130 different vendors. These errors were brought to the attention of DoD IG in numerous meeting and discussion forums, however the audit position remains unchanged. DoD IG draft audit report specifically cites three examples of how Navy overstated cost of traditional support in the BCA. Navy's response to these three examples is provided in Addendum 3 as part of the discussion on Navy's "Decision Tree" for price determination.

(2) An outdated matrix to calculate in-house repair costs versus historical data that were available from the Naval depots. DoD IG stated that Navy used "an outdated matrix" to calculate repair costs, instead of using historical data for similar items that were available at the naval depots. Navy concurs that the matrix was outdated. However, Navy does not concur that use of data available from the Naval Aviation Depot (NADEP) for F/A-18 C/D aircraft is more reliable.

Repair cost matrix methodology is a tool used for new system repair price projections. This matrix was used because limited repair price data was available for F/A-18 E/F components when the BCA was prepared. The matrix determines a percent of repair cost based on the procurement cost of an item to create an average repair cost.

The primary cause for discrepancy in the total repair cost lies not with the matrix, but with disagreement over the acquisition price to which the matrix is applied. DoD IG rejecting matrix methodology is significant since DoD IG states, "the BCA repair costs were overstated." DoD IG asserts that approximately 45% of overstated prices were attributable to overstated acquisition costs. As previously stated, DoD IG methodology in computing acquisition prices is unsupportable. NAVICP updated the 1995 version of the repair cost matrix in December 2002. On average, deviation from the original values used in the BCA was less than 2%.

Final Report Reference

Supporting documentation was provided to DoD IG on 26 February 2003. NAVICP maintains that the matrix is an effective tool to predict repair costs for new systems.

DoD IG suggests Navy use actual repair costs or costs of comparable F/A-18C/D parts to determine BCA repair prices. Navy does not concur. With respect to actual F/A-18E/F repair costs, DoD IG reviewed 23 of 45 parts repaired by either the Original Equipment Manufacturer (OEM) or the depot. NAVICP reviewed repair data obtained and used by DoD IG and determined it was immature and unreliable. For example, DoD IG used repair prices obtained after repair of a very small sample: six out of 23 repair items in table D3 had only one repair action. Nonetheless, DoD IG used this limited repair data to project long-term repair costs.

Furthermore, the repairs that were reviewed could not be considered representative of the repairs to be provided under this PBL. For example, on one item (NIIN 014552564) DoD IG discovered a repair price of $740.50. However, this was based on one repair action, which consisted of a test-and-check, resulting in "no fault found". No actual repair was done. Thus, DoD IG has misinterpreted a non-repair cost as a repair cost. Likewise, on another item (NIIN 014553691), DoD IG determined a repair price of $1,435.28. However, this was based on two repair actions, both of which were "no fault found". This is not a representative repair price. DoD IG 'verified' prices are inaccurate based on both the nature of the repair action and the small sample size. In yet another instance (NIIN 014553645) DoD IG based a repair price ($187.19) on three repair actions. However, all the repairs in the sample were Beyond Economical Repair (BER) actions – a teardown and evaluation was performed, but no actual repair was performed. This is not a valid repair price. These prices are clearly not representative of depot repair costs expected over the life of the contract.

Revised Pages 7, 11, 24, 45, and 51

In previous working draft versions of the audit, the audit team stated that Navy should use more current data obtained against the F/A-18 C/D platform. However, NAVICP determined F/A-18 C/D data was not comparable to F/A-18 E/F data. The F/A-18 E/F is a bigger airframe incorporating newer technology and the items selected are similar in nomenclature only. The size, complexity and, most importantly, the repair cost of the F/A-18 E/F items will be significantly different from those of the F/A-18 C/D. Despite DoD IG's position on F/A-18 C/D comparability, no correlation was provided. In calculating the repair costs for analysis, DoD IG also used NADEP estimated labor and actual historical material costs for comparable F/A-18 C/D parts. NAVICP does not concur with this approach and has determined that NADEP projections for F/A-18 C/D aircraft are less accurate than the NAVICP repair cost matrix.

(3) Savings associated with NAVICP cost recovery rates for obsolescence and net loss that were not justified. Navy does not concur. The draft audit report acknowledges accumulation of $28.3M in costs for obsolete and lost material by the Navy if it did not implement the FIRST contract and continued to follow a traditional support methodology. The audit further states that $11.6M of these obsolescence and net loss costs would occur in the first two years covered by the BCA.

DoD IG's position is that $11.6M in cost for obsolescence and net loss should be added to the "with FIRST" side of the BCA, essentially as costs over and above those implemented in the FIRST contract. The DoD IG position is incorrect as the cost for obsolescence and net loss are included within the scope of the FIRST contract. The contract clearly shows that obsolescence and net loss are responsibilities borne by Boeing under the FIRST contract. Because FIRST is initially a cost reimbursable contract, it is correct that Boeing will pass any costs for obsolescence and net loss to the Navy. However, DoD IG has not considered the cost containment and incentive provisions within the contract that encourage Boeing to eliminate additional costs including obsolescence and net loss. Attachment A of the FIRST contract lays out the responsibilities for

Final Report
Reference

obsolescence management. Page 2 of this attachment states, "FIRST will manage obsolescence for the equipment and materials required to support fielded and out-of-production items covered under this contract." Boeing considered the management of obsolescence and net loss its responsibility when quoting the FIRST contract. Boeing expects to control costs related to obsolescence and receives incentives to stay within target costs. Therefore, inclusion of an additional $11.6M as advocated by DoD IG would not be appropriate.

Revised
Page 13

The draft audit report adds that Navy has "expended about $1 million for material that has become obsolete." This is an incorrect statement and implies Navy incurs an additional $1 million cost. DoD IG refers to five items, totaling $957K that Boeing procured in order to mitigate the risk of future obsolescence. This value is included in the FIRST target price. Proactive management such as this underscores the need for a contract that manages this process. FIRST is designed to do precisely this. Thus, the audit's application of obsolescence and net loss is based on incorrect assumptions not supported by either Boeing management or the FIRST contract.

(4) Cost avoidances claimed by NAVAIR relating to integrated logistics support elements that were not fully supported or justified. Navy does not concur. Throughout the report, auditors reference the BCA prepared by Naval Air Systems Command (NAVAIR). The auditors assert "the Naval Air Systems Command used the business case to justify entering into a teaming arrangement with Boeing." In actuality, the "teaming arrangement" (i.e., the contract) that resulted from this procurement was negotiated and awarded by NAVICP.

As noted in the draft report, the NAVAIR BCA was prepared in June 1999 by NAVAIR. Many aspects of the procurement have changed since that time and the NAVAIR BCA was not utilized to support award of FIRST. Once NWCF was designated as the funding source for this program, NAVICP prepared a BCA to support contract award.

DoD IG has also cited the NAVAIR BCA as being a critical component of Navy's notification to Congress, as required by Public Law 105-261. This is not true. The notice to Congress stated:

> The NWCF BCA at enclosure (1) is the basis for the proposed contract award; however, NAVAIR PMA-265 has estimated additional savings/cost avoidances to other Integrated Logistics Support elements over the same five year period totaling $74 million for a combined total of $129 million[1]. A copy of the PMA-265 BCA is available upon request.

Thus, although Navy wanted to identify all potential savings, notification to Congress clearly states, "The NWCF BCA at enclosure (1) is the basis for the proposed contract award..." In fact, Navy provided a copy of NAVICP's BCA as an attachment to the notice, while only offering to provide a copy of the NAVAIR BCA upon request. The $126.1 million that is often cited in the report was not the basis for award.

Once NWCF was designated the funding source, NAVAIR was not requested nor required to update their BCA. The NAVAIR business case was not used to support or justify award of NAVICP's FIRST contract, and projections derived from the NAVAIR BCA are not part of NAVICP BCA. Therefore, comments related to the NAVAIR BCA included in this audit are not considered relevant to the FIRST contract.

[1] This value was adjusted to $126.1 million.

(5) A non-traditional methodology to calculate the in-house cost of managing consumable items. Navy does not concur. The reduction in savings that the audit attributes to methodology is actually caused by DoD IG use of incorrect procurement prices. As previously addressed, DoD IG's methodology in computing procurement prices is unsupportable and impacts this and many other areas within the audit. DoD IG revised methodology applying Defense Logistics Agency (DLA) 2002 cost recovery rate of 29% to procurement price estimates. Navy methodology, however, applies a composite rate for each issue and receipt transaction in a traditional environment. As stated in previous draft reports, when DoD IG methodology was applied to valid procurement prices, Navy would expect an additional $11M in savings under the FIRST program. It has been noted, however, this finding was removed from the final draft report.

Recommendations

A.1. We recommend the Commander, Naval Supply Systems Command develop a methodology and issue guidance for preparing business case analyses (BCA) that considers the reliability of the data used to determine:

a. Consumable and repairable item prices with little or no procurement history, whether the item was procured directly from the original equipment manufacturer, economic order quantities, and high cost items.
b. Repair of repairable item prices with little or no repair history and high cost items.

DON comment: Navy partially concurs. Existing methodology is actively used by Navy and provided in Addendum 3. NAVSUP and NAVICP continuously work to improve BCA procedures for PBL contracts. The BCA used in this procurement was developed by NAVSUP and meets both of the above objectives. NAVSUP will issue guidance incorporating existing methods by 31 July 2003. NAVSUP will ensure actions, or non-actions, are documented to establish audit trails supporting future major PBL decisions made.

NAVSUP will continue to support NAVICP's standard approach used to estimate new item procurement and repair prices. For example, using the Repair Cost Matrix (RCM) is considered an acceptable tool and guidance will be incorporated in annual price update (APU) call letters, commencing April 2004. Refresh of the RCM in December 2002 shows the 1995 RCM was less than an average 2% deviation for the six categories of prices, ranging from –1% to 5%, and is considered within acceptable tolerance. Based on the low deviation, the matrix is considered a reliable source of information when historical repair cost data is not available. However, it appears DoDIG did not accept NAVICP's validation of RCM data by not revising this finding in the final draft report.

A.2. We recommend the Commander, Naval Inventory Control Point, Philadelphia prepare a new business case to determine whether exercising future contract options is warranted and whether the FIRST Program provides the best value for the Navy and should continue.

DON comment: Navy does not concur. However, the BCA process is under continuous review and updates are made periodically, when warranted. The BCA initially used to justify award of the FIRST contract is fully supportable for the base period of the contract. The BCA will be updated to include appropriate revisions to "with PBL" costs, for example improved demand data, and will be used to evaluate future contract options. It is noted that without additional information to determine "without PBL" costs, a refreshed BCA will likely reach the same conclusion as original government cost projections.

Monetary Issues: Finding A. BCA for the Navy FIRST Program

As a result, the $126.1 million savings (NAVICP, $52.4 million, and NAVAIR, $73.7 million) that the Navy claimed to support award of the FIRST contract were incorrect. The initial BCA met the savings requirements needed to enter into a prime vendor contract for depot-level maintenance required by Public Law 105-261, section 346; however, the benefits are now questionable. We calculate, using data not always available when the BCA was prepared, that the FIRST Program was costing $144.9 million more than traditional support for the first five years (NAVICP cost increase of $155.1 million and the NAVAIR savings were only $10.2 million.).

DON Comment: Navy does not concur. For reasons discussed above, Navy does not agree that a cost increase of $155.1 million dollars will occur, or that the FIRST Program will cost $144.9 million more than traditional support for the first five years. The DoD IG audit of FIRST is based on unexplained and unsubstantiated assumptions regarding traditional support. In addition, Navy asserts that DoD IG fails to recognize or consider benefits of the PBL approach that go beyond traditional spares and repair contracting.

Finding B. Performance-Based Logistics Support Contract for the F/A-18E/F Aircraft

The Navy FIRST contract does not effectively implement the material management and reliability improvements described in the acquisition plan for the FIRST "performance-based" concept. Specifically, the FIRST contract failed to require Boeing, in conjunction with NAVICP to:

(1) Reduce repair cycle times and achieve a minimum 10 percent reliability improvement from baseline calculations,
(2) Reduce and effectively monitor infrastructure support costs to include Navy inventory investment,
(3) Procure items directly from the OEMs to reduce pass-through costs, and
(4) Accurately charge fleet customers.

As a result, the 13 percent life cycle cost reductions proposed in the acquisition plan appear questionable. We calculate that the Navy Working Capital Fund (NWCF) portion of the FIRST Program infrastructure support costs was running about 77 percent (minimum) of spare part or repair cost versus the intended 34 percent. The Navy also funded about $54 million of inventory stored in the Boeing commercial warehouse, significantly reducing the performance burden; pass-through costs increased program costs by $5.1 million for applicable items; and Navy customers were overcharged $12.1 million by the NWCF for 115 parts issued to the fleet.

DON comment: DoD IG draft report states the audit objective was "...to determine whether the...data used in the BCA...support the decision to award a commercial contract to Boeing..." It is unreasonable for the

audit to evaluate cost savings, availability, and reliability data used in the BCA by using data "not always available when the BCA was prepared."

(1) Failure to reduce repair cycle times and achieve a minimum 10 percent reliability improvement from baseline calculations. Navy does not concur. DoD IG findings lack differentiation between program goals for lifecycle support of the aircraft versus those expected in the Phase-I Contract of two years (with three one-year options). DoD IG cites NAVICP for not requiring a 10% reliability improvement in the contract as identified in the acquisition plan. This is invalid for several reasons. The primary purpose of a cost vehicle for the early years of the program was to obtain a valid baseline of aircraft performance in a fielded environment. This will be the baseline for measuring future gains. Additionally, and more importantly, the 10% reliability growth was anticipated over the program lifecycle, not in a two-year initial performance period. The lack of an objective metric in no way invalidates reliability improvements needed to assure program lifecycle goals are achieved. Also, DoD IG inaccurately describes the scope of the supportability metric to "identify, assess and address trends" when the actual contract requirement is to "develop and implement initiatives", clearly a more definitive requirement. Further, DoD IG states that this only applies to a subset of fielded components. This is true, however, it is on the subset of problem components Navy wants Boeing to focus on at this stage of the program lifecycle.

DoD IG also indicates a repair cycle time metric was not contractually established. The acquisition plan never anticipated a repair cycle time metric. What it stated was "repair cycle reduction will be facilitated by use of expedited transportation of material and guaranteed delivery of spare parts to support repair". Both of these provisions are incorporated into the contract. The sparing model used by Boeing to estimate the wholesale sparing level is based on a 45 day repair turn time comparable to the 60 day organic NAVICP modeling number. Consequently, the contract price is based on reduced repair cycle time. Repair cycle time, as a separate metric, has relevance to the Navy only when used in an organic sparing model. FIRST is a performance-based contract and Boeing is not required to use Navy models. The metric in FIRST is material availability because it measures support performance provided to the fleet. While Navy believes Boeing has reduced repair cycle times as one element in their overall strategy to provide material availability, Navy chose not to measure performance using this metric.

In addition, DoD IG asserts that FIRST does not effectively implement material management and reliability improvements described in the acquisition plan. This assertion is incorrect. DoD IG selected excerpts from NAVICP's plan to support an audit position that FIRST contract is deficient.

Initially, as DoD IG accurately portrays in the report, FIRST was intended to be a NAVAIR funded effort with contracting support from NAVICP. Many aspects of the acquisition plan, dated 12 January 2000, support the original version of this program, which was not financially supported by NWCF-SM. Throughout program planning, many aspects were revised as development of a program of this magnitude evolved. DoD IG conveys Navy's lack of compliance with the acquisition plan. NAVICP views this as an administrative shortfall on their part by not updating the plan as changes took place.

(2) Failed to reduce and effectively monitor infrastructure support costs to include Navy inventory investment. Navy does not concur. DOD IG recommended NAVICP to develop procedures for tracking infrastructure costs as a percentage of the actual cost of material and require contract performance at the envisioned 34%. Navy does not agree with DoD IG analysis or finding on inventory. The FIRST contract

was awarded based on a BCA that demonstrated FIRST is cost effective when compared to a traditional contract. Prior to award, each element of Boeing's proposal was subject to a thorough analysis and negotiated in accordance with the Federal Acquisition Regulation (FAR) to ensure prices paid were fair and reasonable. The FIRST contract was based on total cost and not on an individual breakdown of costs. The contract does not contain a specific infrastructure support cost percentage goal as indicated by DoD IG. FIRST is structured to provide services and performance specified in the contract, and controls are in place to ensure costs are consistent with the BCA. DoD IG infrastructure and cost recovery calculations are not understood and consequently any conclusions regarding the 77% infrastructure cost computed by DoD IG are not verifiable.

Navy Inventory Investment.
DoD IG recommends that FIRST "leverage proven commercial support concepts and shifts responsibility for maintaining inventory to Boeing to eliminate all Navy owned inventory". NAVICP determined Government ownership of material to be appropriate. The following apply:

-DoD IG does not address regulatory requirements for 100% government ownership of material under a cost reimbursable contract.
-DoD IG does not recognize the difference in costs/risk for a contractor to invest in high cost repairable inventories compared to the costs/risk for investment in consumable type (DLA) materials.
-A much higher rate of profit is paid under contracts requiring contractor investment/ownership of material than is paid under FIRST.
-DoD IG does not address when FIRST transitions to a firm fixed price (FFP) contract any new material (consumables and repairables) manufactured and placed in Boeing's warehouse will be owned by Boeing until it is shipped to Navy customers. In this environment, the cost risk of inventory investment transitions to Boeing since Navy will not take ownership of inventory until it is requisitioned by the fleet.
-DoD IG does not address difficulties of contractor ownership of material in a repairable environment. Specifically, DoD IG does not address the process of having contractor-owned material that is continually migrating between the contractor and the Navy.

The DoD IG report stated that, under the FIRST contract, Navy is unable to properly track the inventory that Boeing has acquired. FIRST includes proper provisions for tracking cost of Navy inventory at Boeing. Navy concurs that Boeing was not in compliance without an approved property accounting system. Boeing has been tasked with revising their procedures. DCMA St. Louis will audit the procedures to ensure compliance with the FIRST contract.

In addition, the audit states, "...the Navy has funded about $54 million of inventory stored in the Boeing commercial warehouse significantly reducing the performance burden on Boeing." Navy does not concur. The FIRST program is a contract for support and not a contract for inventory or parts. The rationality of FIRST was determined based on total program cost, not the cost of any single element. The contract pricing and metrics were negotiated based on inventory levels needed to support projected aircraft usage. Navy is unaware of DoD IG analysis demonstrating that $54 million in inventory exceeds what would have been generated by traditional support or is excessive compared to any standard. Further, Boeing inventory at that time was a combination of material bought by Boeing under FIRST, material supplied to Boeing, as well as retrograde from the repair pipeline. Boeing is the provider of material to support carrier deployments, and retail allowances are not part of wholesale system inventory. It is unclear what the $54 million in inventory

includes. Given the range of contractor responsibility, it is difficult to draw a credible conclusion on life-cycle inventory reduction goals or contractor performance based on a single inventory snapshot.

(3) Failed to procure items directly from the OEMs to reduce pass-through costs. Navy does not concur. DoD IG recommended NAVICP direct Boeing to purchase parts directly from the OEM to avoid pass-through costs. FIRST is not a parts contract. The FIRST contract is a performance-based contract with cost tied to delivery of material. It is Boeing's responsibility to determine sources of supply that enable Boeing to deliver performance and control costs.

(4) Failed to accurately charge fleet customers. Navy does not concur. Since FIRST PBL is a performance contract, NAVICP will ultimately spread total costs across applicable items and will recover no more than the cost incurred under the contract. While on a line-by-line basis prices may be unbalanced, they will be correct in the aggregate. NAVICP refines prices charged to the customer during annual price updates.

Recommendations

B.1. We recommend the Commander, Naval Inventory Control Point, Philadelphia, establish repair cycle times and reliability improvement metrics in the F/A-18E/F Integrated Readiness Support Teaming contract to achieve the savings addressed in its acquisition plan.

DON comment: Navy does not concur. The acquisition plan never anticipated a repair cycle time metric, as customer wait time and fill rates are the relevant metrics in a performance-based agreement. Navy chose not to measure repair turnaround time (RTAT) as a separate metric and focused on overall material availability. The 10% reliability growth was anticipated over the lifecycle of the program, not in a two-year initial performance period. Moreover, the lack of an objective metric in no way invalidates the reliability improvements needed to assure program lifecycle goals are achieved.

B.2. We recommend the Commander, Naval Inventory Control Point, Philadelphia, develop procedures to effectively track infrastructure support costs as a percentage of the actual cost of material issued to the fleet customers to determine whether the F/A-18E/F Integrated Readiness Support Teaming Program can actually be performed for the 34 percent envisioned for the program.

DON comment: Navy does not concur. Navy believes DoD IG has misinterpreted the Navy burdening and cost recovery rates applied to FIRST items. Some elements that must be covered remain direct Navy costs and are reflected in the 34% cited. Other elements are assumed by Boeing and are in the price Boeing charges Navy. The 34% is applied to the Boeing price and was never intended to be a cap on total 'infrastructure costs', but as an estimate of Navy's (versus Boeing's) direct costs.

B.3. We recommend the Commander, Naval Inventory Control Point, Philadelphia, require Boeing to effectively track the cost of Navy inventory in the Boeing commercial warehouse and determine whether the F/A-18E/F Integrated Readiness Support Teaming Program will be able to leverage proven commercial support concepts and shift responsibility for maintaining inventory to Boeing to eliminate the entire Navy-owned inventory.

DON comment: Navy partially concurs. DoD IG implies Boeing is not effectively tracking cost of Navy inventory however FIRST contract does include appropriate provisions for tracking at Boeing. Navy concurs that Boeing should own 'undelivered' consumable and repairable inventory, and plans to shift these responsibilities under a Firm Fixed Price contract.

B.4. We recommend the Commander, Naval Inventory Control Point, Philadelphia, require Boeing to purchase parts directly from the original equipment manufacturers to avoid pass-through costs.

DON comment: Navy does not concur. Navy is buying performance, not material. Boeing is responsible to select the best value providers that enable Boeing to meet performance and cost targets.

B.5. We recommend the Commander, Naval Inventory Control Point, Philadelphia, initiate appropriate action to charge customers prices that are based on actual costs.

DON comment: Navy concurs and acknowledges prices should be updated to ensure customers are charged prices based on actual contract pricing information. This is routine procedure. Actual FIRST prices will be incorporated in the Fiscal Year 2004 Annual Price Update.

Monetary Issues: Finding B. Performance-Based Logistics Support Contract for the F/A-18E/F Aircraft

As a result, 13 percent life cycle cost reductions proposed in the acquisition plan appear questionable. We calculate that the Navy Working Capital Fund (NWCF) portion of the FIRST Program infrastructure support costs was running about 77 percent (minimum) of spare part or repair cost versus the intended 34 percent. The Navy also funded about $54 million of inventory stored in the Boeing commercial warehouse, significantly reducing the performance burden; pass-through costs increased program costs by $5.1 million for applicable items; and Navy customers were overcharged $12.1 million by the NWCF for 115 parts issued to the fleet.

DON Comment: Navy does not concur. As addressed in previous discussions, NAVICP has not, nor expects any monetary disadvantages as a result of the FIRST Contract.

Appendix A. Management Control Program Review

DoD Directive 5010.38, "Management Control (MC) Program," August 26, 1996, and DoD Instruction 5010.40, "Management Control (MC) Program Procedures," August 28, 1996, require DoD organizations to implement a comprehensive system of management controls that provides reasonable assurance that programs are operating as intended and to evaluate the adequacy of the controls.

DoD IG finds Navy controls over data integrity did not ensure costs shown in BCAs were derived from reliable pricing data and sound judgments. ASN (RD&A), who is responsible for acquisition policy, should have established the controls according to DoD IG. The recommendations in this report, if implemented, will improve procedures for preparing business case analyses.

Navy officials identified the preparation of business case analyses as a part of an assessable unit. Navy officials did not identify the specific material management control weakness identified by the audit because the Navy evaluation covered the whole performance-based logistics process and did not focus on the controls over the integrity of data used to prepare BCAs.

DON Comment: Navy partially concurs not all management controls were enforced. For example, maintenance of the repair cost matrix was not routinely monitored. This posed minimal impact on repair price estimates, not acquisition cost. Otherwise, data used in the BCA was appropriately analyzed and reviewed. After matrix validation, Navy confirms BCA data as accurate projections. Costs calculated for traditional F/A-18E/F support was based on best available pricing data when the BCA was prepared. Navy supports the BCA as justification to award the FIRST contract.

ADDENDUM 1

Examples of Benefits Obtained by Navy through the FIRST PBL CONTRACT

DoD IG does not include FIRST program benefits in the audit report. The following benefits of the FIRST PBL contract are summarized below in order to demonstrate its effectiveness:

1. **ALLOWANCE EFFECTIVENESS**. Contractually, the standard of excellence for carrier allowance effectiveness is 95% range and 95% depth. FIRST Supply Chain Management (SCM) pressed to surpass that level of performance. The USS ABRAHAM LINCOLN deployed four months early and its cruise was extended to nearly ten months, which is unprecedented. Despite this, FIRST repairable allowance effectiveness for the USS ABRAHAM LINCOLN was at 99% range and depth. The USS ABRAHAM LINCOLN also achieved 100% range and depth effectiveness for FIRST consumable items. Similarly, allowance effectiveness is at 99% range and depth for the USS NIMITZ for FIRST repairable items. For FIRST consumables, range and depth effectiveness on the USS NIMITZ is at 100%.
2. **BACKORDER BURNDOWN**. After the FIRST PBL contract was awarded, among the requisitions referred to Boeing by NAVICP for fill were 270 documents that had been originated by the Fleet prior to FIRST award. All of these backorders have been resolved. Boeing was not bound to objective performance metrics for this subset of requisitions. We view their efforts to close out these aged requisitions in tandem with requisitions where discrete performance metrics do apply as evidence of a strong commitment to Fleet support. Of the 15,512 requisitions receipted by FIRST SCM since May '01 contract award, only 278 (less than 2%) remain in work.
3. **TOTAL ASSET VISIBILITY (TAV)**. The FIRST TAV Information Technology (IT) architecture provides real time provisioning, asset management, requisition status, and repair throughput information along with delivery and-in-transit shipping information, and specialized reports. Over time, Boeing has demonstrated its flexibility and responsiveness to evolving user needs by customizing screens and enhancing functionality. The TAV screens are user-friendly and employ a drill-down approach from the macro-level to supporting detail data. FIRST SCM has provided training to the Fleet in order to familiarize users with its full functionality and to teach them how to navigate through its screens. The Fleet has become more demanding in its expectations of NAVICP and Boeing because of the information available at its fingertips through FIRST TAV.
4. **SUPPORTABILITY.** FIRST is making considerable strides in improving supportability. The following FIRST initiatives demonstrate a commitment to manage obsolescence proactively; to improve fault isolation through Built In Test (BIT) enhancement; and to press for redesign to improve performance and reduce life cycle costs. :
    a. **OBSOLESCENCE MANAGEMENT.** To date, more than 100 obsolescence issues have been identified for resolution. During the most recent period of performance, 3 Limited Life Time Buys and 1 full Life Time Buy Order were executed. Additionally, 12 Alternate Parts were incorporated to replace obsolete items and 6 parts were returned to procurable status. Systems impacted include the Multi Purpose Color Display (MPCD), the Signal Data Computer, the Ice Detector Controller and the Up Front Control Display (UFCD).
    b. **IMPROVING BUILT-IN TEST (BIT).** Early in the life cycle, a nuisance Built Logic Inspection Number (BLIN)/BIT code may cause unnecessary ground/mission aborts, delayed launches, and/or unneeded equipment removals. Later in the life cycle, Maintenance Technicians may become conditioned to the nuisance BLIN/BIT and ignore a valid warning. This can lead to eventual

damage to equipment and/or personnel. FIRST has aggressively pursued BIT improvement. Impacted systems include the MPCD, the UFCD, the Digital Electronic Control Display (DECD), and the Flight Control Computer. Upgrades will include improved fault detection, and increased troubleshooting capability.

c. **DESIGN CHANGES.** FIRST review of Fleet data for the Tension Rod Pawl for the Boarding Ladder revealed seven demands for this item in a six months period. This was a higher rate than was anticipated and its make at depot maintenance concept was deemed unsupportable. Consequently, FIRST In Service Engineering (ISE) requested that the item be centrally procured and stocked at the Organizational Maintenance level. Once the change was in place, FIRST initiated a stock buy for the parts to support VFA-115 on the USS ABRAHAM LINCOLN and is pursuing a design improvement. Additionally, FIRST ISE analysis of Probe Heater Coil failures and RAM Coating failures on the Pitot Static Tube has culminated in a new Heater design coupled with a wiring change. A 3X+ increase over the current Mean Time Between Demand is anticipated upon fielding of the new design. A third initiative involves the Generator Control Unit (GCU). FIRST ISE has proposed a lower cost, more robust GCU with improved fault isolation. A 17% improvement in reliability is anticipated.

5. **INTEGRATED SUPPLY SUPPORT**. FIRST uses all resources at its disposal to resolve support problems that jeopardize operational readiness. For example, FIRST asset managers partner with Boeing Integrated Process Teams, NAVAIR, NAVICP and the Fleet to minimize aircraft downtime and inefficiency. Additionally, FIRST works with its suppliers to accelerate delivery schedules for critical components. FIRST successfully leverages the power of the Boeing SUPERHORNET production line in order to place concurrent production and FIRST spares orders. This contains costs and reduces administrative lead-time. FIRST also borrows assets from the production line in order to satisfy urgent Fleet spares requirements. FIRST demonstrates a strong commitment to continuous business process improvement. It has employed the services of an independent audit team within Boeing to assist with root cause analyses and get well planning. It streamlined internal business processes to allow for "same day" expedited shipment of critical parts. It has blanket purchase order authority for repairs versus having to create individual purchase orders for each repair action. FIRST has flexibility in its allocation of funds to support emerging Fleet requirements. It has streamlined acquisition procedures in place for Inspection Bulletin support. FIRST provides aircraft factory expertise at allowance conferences. It has enlisted the support of subject matter experts among numerous disciplines in order to work with suppliers to optimize manufacturing yields. FIRST has also been the catalyst for the redesign of such items as the Horizontal Stabilator, Canopy, Pitot Static Tube, MPCD and Leading Edge Flap Antenna, which have poor reliability.
6. **CUSTOMER SATISFACTION**. In his March 2003 testimony before the House Armed Services Subcommittee on Readiness, Vice Chief of Naval Operations cited FIRST as a PBL success. It was noted that supply availability for the F/A-18 E/F is at 85% versus 62% for F/A-18C/D aircraft. Feedback about FIRST from the Type Commanders, Fleet maintainers, operators at the squadron level and supply personnel has been consistently positive and enthusiastic. The FIRST SCM team focuses squarely on customer support. Its ability to partner constructively with all stakeholders and its proactive approach to problem solving has won the confidence of the SUPERHORNET community.

Final Report Reference

ADDENDUM 2

Examples of Items From DoD IG Documentation Where Prices for Traditional Government Support Are Taken Directly From the FIRST Contract

DoD IG states: "limited historical prices were available for only 10 of 76, or 13.2 percent, of consumable parts and 37 of 71, or 52.1 percent, of the repairable parts reviewed." However, DoD IG then concludes that, for the remainder of the parts (i.e., where there was no historical pricing information), NAVICP price was higher than "the audit verified price." Since there was no historical price available, Navy questions the legitimacy of pricing DoD IG advocates.

NAVICP requested DoD IG provide documentation to support prices used in the "IG Verified Costs" columns of Tables D-1 and D-2 of the report. For Table D-2, NAVICP was able to find back-up data for only 38 of the 71 items reviewed in the final report. Analysis of this data shows that the prices used by DoD IG were prices obtained as a direct result of the FIRST contract, or what appears to be a weighted average of FIRST and production prices. Examples of those items where prices are a direct result of the FIRST contract are contained in the Table below.

Darkened areas of this report represent contractor proprietary data that has been deleted.

NIIN	BCA Price	Source	IG Price	Source
01-480-8207	$23,633.10	PBOM (See note 1)	$ [redacted]	FIRST
01-455-1435	$ 5,524.62	CSF (See note 2)	$ [redacted]	FIRST
01-455-1444	$ 9,484.68	CSF	$ [redacted]	FIRST
01-455-4490	$139,000.00	CSF (UCA)	$ [redacted]	FIRST
01-469-1468	$102,258.00	CSF	$ [redacted]	FIRST
01-470-8721	$ 48,343.00	SLIC (See note 3)	$ [redacted]	FIRST
01-454-6710	$ 95,867.84	SLIC	$ [redacted]	FIRST
01-475-8514	$ 65,016.00	PBOM + 8%	$ [redacted]	FIRST
01-463-6963	$137,425.00	SLIC	$ [redacted]	FIRST
01-479-3745	$ 41,290.00	SLIC	$ [redacted]	FIRST
01-479-3620	$ 34,090.00	SLIC	$ [redacted]	FIRST
01-479-3778	$ 37,020.00	SLIC	$ [redacted]	FIRST
01-469-1460	$ 56,260.00	SLIC	$ [redacted]	FIRST
01-470-8681	$ 83,610.00	SLIC	$ [redacted]	FIRST
01-465-8656	$ 12,050.00	CSF	$ [redacted]	FIRST
01-470-8683	$ 4,390.00	SLIC	$ [redacted]	FIRST
01-470-8685	$ 17,707.68	PBOM + 8%	$ [redacted]	FIRST
01-455-3692	$256,560.00	CSF	$ [redacted]	FIRST
01-470-8681	$ 83,610.00	SLIC	$ [redacted]	FIRST

Notes:
1. Proposed Bill of Materials
2. Boeing's System Logistics Integration Capabilities database
3. Uniform Inventory Control Point Contractor Status File

Final Report Reference

ADDENDUM 3

NAVICP's "Decision Tree" on How to Determine Prices for Traditional Government Support Side of the BCA

In preparing a BCA, Navy compares prices proposed by the contractor under a PBL (with some adjustments to include costs incurred by Navy under the PBL) to prices projected under traditional method of procurement. For the traditional method of procurement, Navy uses the following steps for projecting prices Navy would incur without a PBL arrangement:

- If procurement history is available, use most recent contract price.

- In absence of historical contract prices, review estimated file prices. If the file price is based on procurement of a "comparable" alternate configuration, use the file price from the alternate.

- In the absence of valid contract or file prices, System Logistics Integration Capabilities (SLIC) prices developed by the contractor during Logistics Supportability Analysis processes are used unless the contractor's Proposed Bill of Materials (PBOM) price is higher. In this case, PBOM prices are verified by the contractor at Navy request. Boeing validated prices and confirmed associated SLIC prices required refresh. In all cases where the PBOM prices were used, a burdening rate of 8% is applied to capture costs NAVICP would incur when procuring these items under a traditional approach.

DoD IG argues NAVICP used unreliable data. NAVICP used historical pricing data when available. If historical data was not available, a decision tree was used and is a sound approach to determine prices in the absence of historical data.

DoD IG cites specific examples to demonstrate prices used by NAVICP were not accurate and reasonable. It should be noted the BCA was prepared during a period when NAVICP computer applications were being upgraded. Consequently, some prices in queue for file upload were not captured at the time of our data extract. For example, NAVICP used a firm contract price of $142,616 in the BCA for NIIN 014545712, Electrical Control Box. DoD IG is correct in saying an additional order was released for $54,777 and the BCA should have reflected this price. NAVICP is unable to ascertain how DoD IG arrived at a price of [redacted] this price appears to be a weighted average price based upon FIRST and production orders.

The second example cited by DoD IG is NIIN 014691460, Pressure Regulating Valve. NAVICP used the SLIC price of $56,260. A review of contract files could not locate an order for 12 ea at $20,000 per unit. The [redacted] price DoD IG supports is a price obtained under FIRST. As discussed above, the Navy contends that it was not possible to obtain FIRST pricing data using traditional procurement methodology.

The last example cited by DoD IG is NIIN 014552550, Antenna. NAVICP used a price of $17,536 based on a documented contract price. DoD IG contends NAVICP should have used a price of [redacted] which appears to be an average of production and FIRST prices.

Darkened areas of this report represent contractor proprietary data that has been deleted.

Team Members

The Contract Management Directorate, Office of the Assistant Inspector General for Auditing of the Department of Defense prepared this report. Personnel of the Office of the Inspector General of the Department of Defense who contributed to the report are listed below.

Robert K. West
Henry F. Kleinknecht
Patrick J. Nix
Myra M. Frank
Joseph P. Bucsko
Jason T. Steinhart
Nicole A. Lukacs
Matthew J. Rok
Thomas G. Daquano
Shannon L. Strang
Michael B. Vandesteene