

NAVAL AIR SYSTEMS TEAM

# TOTAL OWNERSHIP COST (TOC)

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IMPLEMENTATION GUIDEBOOK  
Version 1.0 (Revised)

This document has been approved  
for public release

Version 1.0 (Government version)  
is available for  
NAVAIR personnel  
301 342-0242

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# TOC IMPLEMENTATION GUIDEBOOK

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## Background

### Total Ownership Cost Definitions

Total Ownership Cost, as defined by USD (RD&A), Memo of 13 Nov 1998 from US RD&A, Subj: Definition of Total Ownership Cost (TOC), Life Cycle Cost (LCC), and the Responsibilities of Program Managers, consists of the following key elements:

- **DoD TOC** consists of the total costs to operate the Department of Defense (DoD) including acquisition of Defense systems, operations and sustainment of weapon systems and personnel resources and all other costs associated with the business operations of the DoD.
- **Defense Systems TOC** is defined as the Life Cycle Costs of individual Defense Systems in the broadest sense of all direct acquisition costs, all operations, support and disposal costs associated with an individual system and all indirect costs attributable to the system.
- **Program Manager TOC Role** is defined as the responsibility to ensure continuous reduction of LCC for their system. This cost reduction effort is labeled Reduction in Total Ownership Cost (R-TOC).

(See slide provided in Appendix A for the full definitions included in the USD (RD&A) Memorandum)

### DSAC Stretch Goals

The leadership within the Department of Defense is very serious about reducing Total Ownership Cost as the key requirement to maintain a strong defense posture for our nation's future. The Defense Systems Affordability Council (DSAC) has developed **draft** stretch goals representing a vision of the type of cost reduction achievable through viable and proactive R-TOC programs initiated and sustained by Program Managers. These goals are provided below as an indication of the magnitude of the task facing our programs and Integrated Product Teams to reach the kinds of savings that are considered imperative to maintain and upgrade our Naval Aviation war fighting resources. While these goals do not represent an absolute mandate they do clearly represent the planning and "requirements" of senior Navy leadership associated with successful R-TOC efforts.

- **New/In acquisition** – New start programs to achieve or surpass Cost as Independent Variable (CAIV ) targets (**that are 20-50% below historical norms**) for at least 50% of programs by FY2000
- **In service (fielded)** - Reduce O&S per weapon system per year compared to FY97 baselines as follows:
  - 7% reduction by FY2000
  - 10% reduction by FY2001
  - Stretch goal of 20% reduction by FY2005

## **Purpose of Guidebook**

The purpose of this guidebook is to provide the information resources need for program managers, Integrated Product Teams and supporting cost analysts to respond to Reduction in Total Ownership Cost (R-TOC) requirements and to develop comprehensive programs that provide the necessary focus on reducing those costs to allow Naval Aviation to continue to fulfill its mission requirements while providing the resources needed for recapitalization and modernization. It provides copies of key documents establishing TOC requirements, contains copies of the key templates needed to define and document TOC plans, describes processes to be used within the NAVAIR team and contains lists of TOC points of contacts who can support program teams in the R-TOC activities. This guide also provides answers to many Frequently Asked Questions associated with TOC and R-TOC activities.

## **Implementation Approach**

### **NAVAIR Implementing Guidance**

Guidance for developing the TOC Baseline was provided in the AIR-1.0 memo 13000 Ser AIR-4.2.5.1/TOC of 31 Jul 98 (See Appendix I). Supplemental information was published in an AIR-4.2 memo of 25 Nov 98 (See Appendix B) This memorandum established cost representatives for each PEO as focal points for TOC information and guidance to the programs. The information in this guidebook is furnished to supplement and expand upon these implementing memorandums.

We recommend that all programs visit the NAVAIR web site: <http://www.navair.navy.mil/toc/> for up to date information on TOC requirements and implementing instructions. A copy of this guidebook is on the web site and will be updated as a living document as changes occur reflected either in supplemental guidance or additional information on TOC and R-TOC. Review of the materials on the Web Site will be very useful so that programs have additional perspective on TOC/R-TOC issues and know what will be expected of them. A key part of the web site information relates to points of contact that are available to support programs. Support consists of several types of assistance:

- 1) General guidance is available through the following POC:

AIR-4.2 COST DEPARTMENT 301 342-0242

- 2) If a program already has AIR-4.2 Cost Department personnel supporting their IPTs, program office personnel should speak with the points of contact assigned to their program.
- 3) If a program has no funded AIR-4.2 support and requires dedicated assets for this effort, the program offices should contact the appropriate individuals on page B-3. These AIR-4.2 division and branch heads can either provide NWCF or qualified contractor support personnel if programs need to add dedicated funded resources to support TOC requirements

- 4) AIR-4.2 has recently completed their Operating & Support (O&S) estimates on twenty-one selected aircraft, and are listed on page B-4.
- 5) Any questions that are peculiar to a weapons system can be raised with the individual TOC Implementation Team members that have been assigned to your competency or PEO that are listed on page B-5.

**CORE ELEMENTS - Developing the TOC Baseline**

For pre-Milestone III ACAT I-IV programs, the TOC Program Baseline is a standardized time-phased summary of a program’s life cycle cost elements (Research, Development, Production, O&S, and Disposal) plus those additional direct and indirect cost encompassed by the TOC definition (shown above on this page). The Appendix C TOC Baseline template contains a “Prior” year column which allows the user to input a summation of program cost incurred to date. The next column contains the first fiscal year of a ten-year window and can be overwritten to adjust the period of time of interest. Following the ten fiscal year columns is a “To Complete” column to capture the remaining life cycle costs of the program beyond the ten years shown. Cost input must be done in current fiscal year dollars to normalize for inflation. Business Financial Managers (BFM’s), and Cost Team Leaders (CTL’s) as well as other Cost Department (AIR-4.2) individuals, shown in this section, can assist Program Managers (PMs) with developing this baseline. Based on what the Prior costs have been, what the programs Weapons Systems Program Document (WSPD) indicates, and what the predicted O&S and disposal costs will be, PMs can determine what their life cycle cost picture looks like. PM’s need to consider the following when they are going through their calculations:

- Navy Working Capital Fund (NWCF) personnel.
- Specialty training for undergraduate pilots, non-pilot aircrew and maintainers.
- Modifications captured under Affordable Readiness baselines (HONA category A and B type modifications).
- When a program is introducing a new system, common support equipment costs required as result of introducing the new system.
- For systems under acquisition, programs should take credit for and include in their CAIV plans, initiatives that currently exist and are being implemented. For fielded systems, savings on all initiatives that have not been reflected in their FY97 baseline can be credited in their Affordable Readiness plans.
- Core program office Expense Operating Budget (EOB). Include both Civilians and military. Joint program offices need to include ALL services in their headcount. The following rates should be used for this calculation:

HQ Civilians	\$78,744	}	FY99\$
Officers	\$82,668		

Enlisted

\$36,651

- Add Demilitarization and Disposal Costs if and when available (Just cost to get the system to the “desert,” not the cost to maintain after that point).

*For post-Milestone III ACAT I-IV programs, the TOC Baseline is that which was established in the Affordable Readiness Plan plus all of the applicable items shown in the above bullets.*

*For establishing TOC objectives and thresholds on all programs, the TOC objective to be included in the Acquisition Program Baseline document (see Appendix J) should equal the program TOC baseline less the cumulative net cost avoidance associated with the program’s CAIV (for pre-Milestone III programs) or Affordable Readiness (for post-Milestone III programs) initiatives.*

Unless otherwise specified, the TOC threshold should then be the TOC objective value plus 10% in accordance with SECNAVINST 5000.2B.

For those programs involving systems employed on multiple platforms, clearly identify if initiative investment cost or cost avoidance associated with that system are also included in the platform baselines. This is to avoid double counting of potential cost avoidance.

TOC Baseline should be updated with APB revisions or when major programmatic changes occur.

### **Identifying the Cost Drivers**

*For pre-Milestone III ACAT I-IV programs, we have determined that the following factors do have an affect on cost: 1) the performance of a system or subsystem; 2) the mission of the weapons system; 3) the acquisition strategy for a program; 4) the timeliness of the acquisition; and 5) the quantity that will be procured. DAPML’s should challenging their IPT’s, and especially their LEMs, to review whatever existing data there is available on these new systems to ensure that they will achieve design capabilities.*

*For post-Milestone III ACAT I-IV programs, we know from experiential data that the top Naval Aviation cost degraders are the following: 1) direct cost per flight hour; 2) Aviation Depot Level Repair (AVDLR) parts; 3) consumables; 4) petroleum, oil and lubricants (POL); 5) direct maintenance man-hours (labor); 6) Depot costs (ISR, engine repair, SDLM). VAMOSOC can provide cost data on two-, five-, and seven-digit Work Unit Code (WUC) items.*

Every program is different, and now, to be able to identify cost drivers, PM’s are required to review the data and find out which systems, subsystems and components are not performing as efficiently as they were designed to. Therefore, PMs should be better able to pinpoint what cost drivers they have on their individual programs.

### **Providing CAIV or Affordable Readiness Initiatives**

Reducing TOC is a continuous process, and CAIV (*for pre-Milestone III programs*) and AR (*for post-Milestone III programs*) Plans are already in-place that incorporate program objectives. The objective of these plans is sustained readiness and enhanced safety which by reducing acquisition and support costs increases availability of funds for modernization and recapitalization. Initiatives should address a cost or readiness driver. Commonly pursued initiative areas *for all ACAT programs*: Direct Vendor Delivery; Reliability Improvement Warranty, Logistics Engineering Change Proposals (LECPs), Technical Data, Integrated Maintenance Concept, and Technology Re-utilization/Re-cycling. Here are the steps PMs need to follow: 1) determine appropriate program initiatives; 2) collect and normalize historical cost: identify cost elements impacted and collect last five years of data, and then normalize data to constant year dollars using inflation indices; 3) identify conditions associated with initiatives that would be impacted by implementation: complexity/new system that would drive costs, R&M changes, maintenance source or maintenance level changes, and any other that would impact the historical cost baseline; and 4) develop a ten-year initiative projection: clearly document an auditable track, quantify cost avoidance in each cost category used in the baseline, and provide time-phasing of initiative implementation.

#### Program's TOC Goals

- Reductions in Total Ownership Costs
- Reductions in manpower, inventory, and infrastructure
- Extensive use of technology
- Industry/Suppliers sharing risks and common goals through partnering
- Programs success measured on improvements achieved

## Description of Guidebook Supporting APPENDICES

**Appendices A through N** will assist PM's in creating and maintaining an overall TOC picture for their program. **Appendix A** provides two slides that show the latest TOC definition and a process roadmap that have been discussed thoroughly in this section. **Appendix B** provides the AIR-4.2 Memo on Reduced Total Ownership Cost and lists all the NAVAIR cost support personnel who are available to answer questions or help in calculating TOC baselines and initiatives. **Appendix C** provides templates for displaying the program TOC baseline, summarizing the cost reduction initiatives, and displaying investment requirements and potential cost avoidance in the TOC reduction plans (these templates were originally forwarded by an AIR-1.0 memorandum on TOC implementation guidance that is provided in Appendix I of this Guidebook). **Appendix D** furnishes the cost element structures which are explained in detail on the NAVAIR web site. **Appendix E** describes the TOC responsibilities and who is tasked with them. **Appendix F** recommends other sources of TOC information including Web Sites available at NAVAIR and within other agencies. **Appendix G** gives a detailed description of the Affordable Readiness TOC Tracking System. **Appendix H** has the ASN(RD&A) letter that requires the entire Navy acquisition community to implement TOC. **Appendix I** provides an AIR-1.0 TOC implementation guidance memorandum of 31 July 1998. **Appendix J** consists of a write-up on how to prepare an Acquisition Program Baseline. **Appendix K** is an abstract that describes what Affordable Readiness is and how to prepare Affordable Readiness Plans. **Appendix L** provides guidance on how to fill out the TOC Initiative Cost Reduction Template using costs and cost savings from an ECP (DD Forms 1692/3 and 1692/4). **Appendix M** is a list of TOC Frequently Asked Questions. **Appendix N** contains a list of all the ACAT I-IV and, for those that have assigned Cost Team Leaders (CTL's), the name of the CTL.

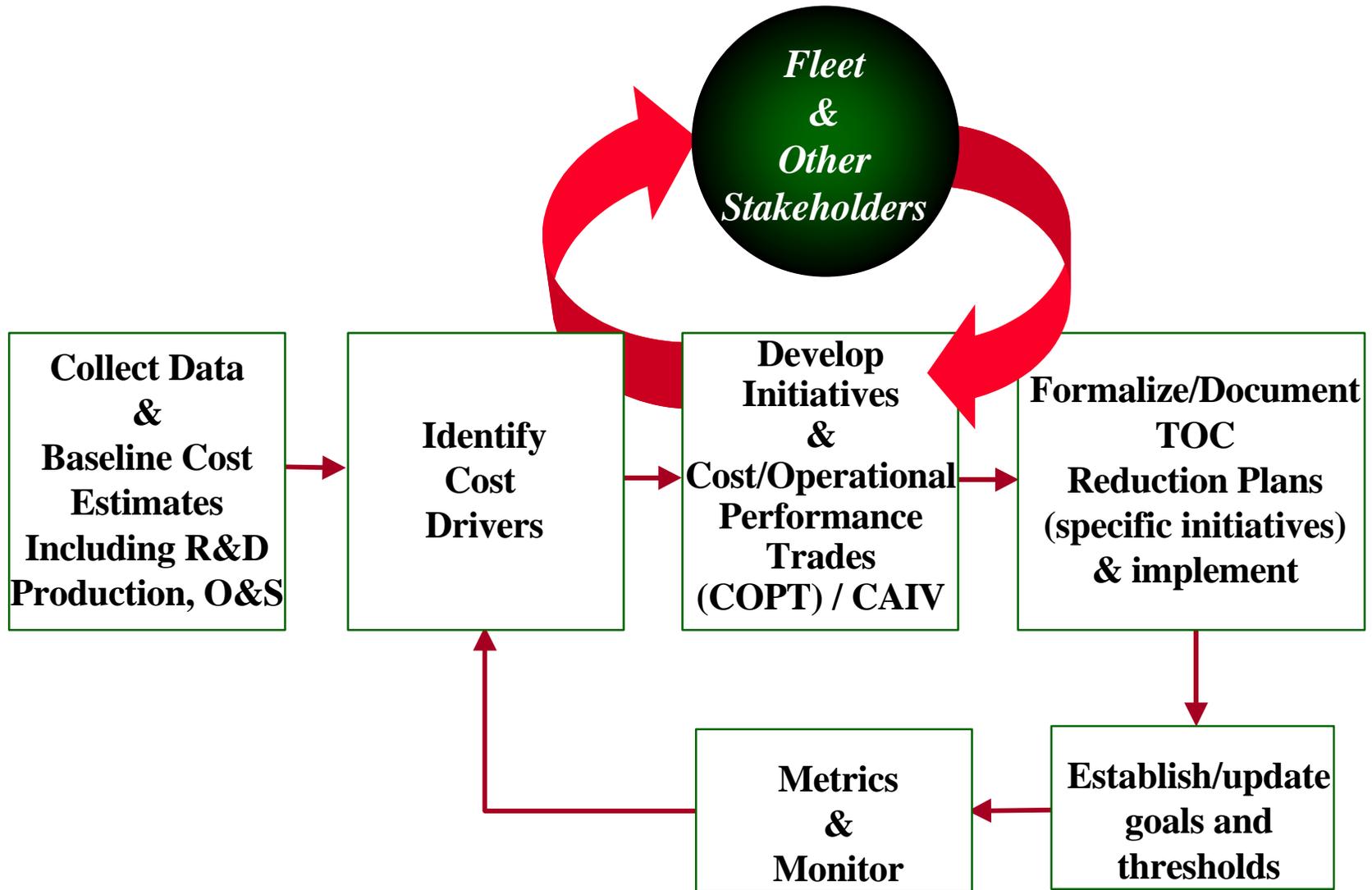
**Appendix A - TOC Definition / Process Roadmap**

# *Definition of Total Ownership Cost*

- **DoD TOC:** “Comprised of costs to research, develop, acquire, own, operate, and dispose of weapon and support systems, other equipment and real property, the costs to recruit, train, retain, separate and otherwise support military and civilian personnel, and all other costs of business operations of the DoD.”
- **Defense Systems TOC:** “defined as Life Cycle Cost (LCC). LCC (per DoD 5000.4M) includes not only acquisition program direct costs, but also the indirect costs attributable to the acquisition program (i.e. costs that would not occur if the program did not exist). For example, indirect costs would include the infrastructure that plans, manages, and executes a program over its full life and common support items and systems.”
- **Program Manager TOC Role:** “The responsibility of program managers in support of reducing DoD TOC is the continuous reduction of LCC for their systems.”

**Source: Memo of 13 Nov 1998 from USD RD&A, Subj: Definition of Total Ownership Cost (TOC), Life Cycle Cost (LCC), and the Responsibilities of Program Managers**

# ***PROCESS ROADMAP***



**Appendix B - TOC Cost Support Personnel**

25 November 1998

MEMORANDUM

From: Commander, Naval Air Systems Command (AIR-4.2)

Subj: REDUCED TOTAL OWNERSHIP COST

**Ref: (a) ASN(RDA) Memo Dated 05 May 98; Subj: Implementation of Total Ownership Cost (TOC) Baselines in the Department of the Navy**

Encl: (1) Cost Department Points of Contact  
(2) Naval Air Systems Command Memo Dated 31 Jul 98; Subj: Implementation of Total Ownership Cost Baselines in the Naval Air Systems Command  
(3) Attendee List from Meeting on 12 Nov 98; Subj: Processing of Reduced **Total Ownership Cost Inquiries**

1. The deadline is fast approaching for all ACAT I and II programs to have a plan in place to reduce total ownership cost as required by Reference (a). As evidenced by the number and types of questions we have been receiving, considerable confusion remains in regards to content and format for these Reduced Total Ownership Cost (RTOC) plans. Although AIR-1.0 is the point of contact for coordination and submission of all actions associated with RTOC, AIR-4.2 is responsible for providing interpretive and implementing guidance. To improve coordination, keep the process moving, and ensure consistency in approach, I have assigned representatives from the Department to work with each PEO/AIR-1.0/DRPM-JSF. These representatives are listed in Enclosure (1).

2. Enclosure (2) contains a definition of total ownership cost, a description of the ASN(RDA) tasking, and initial Naval Air Systems Command (TEAM) implementation guidance. Additional information, guidance, and answers to frequently asked questions can be found at the TEAM web site (<http://www.navair.navy.mil/toc/>) in the form of a TOC Handbook and related topics. As the RTOC initiative process matures clarifications and additions to the guidance will be made as necessary.

3. At this time, NAVAIR guidance states the basis for each program's RTOC Plan shall be their Cost as an Independent Variable (CAIV) and/or Affordable Readiness (AR) plans. RTOC plans must include specific, supportable, and quantified initiatives for reducing total ownership cost. If necessary, CAIV and AR plans should be updated to meet these requirements. Specific formats and templates, provided at the referenced web site, are identified for establishing baselines, costing out both funded and unfunded initiatives and providing updated goals. Each program's RTOC Plan must include a Cost Objective. This Objective should represent the estimated baseline program dollar value adjusted to incorporate both funded and anticipated RTOC initiatives. The Cost Threshold should be the Cost Objective plus 10%. In support of these requirements Cost Department analysts are prepared to assist Program Offices

as RTOC plans are developed. Please ensure their involvement as soon as possible to provide adequate time to complete any required analyses.

4. For all ACAT I and II programs, the Objective and Threshold amounts from the RTOC Plan are to be included in the Approved Program Baseline (APB) and submitted to ASN(RDA) by 31 December 1998. Similarly, ACAT III and IV programs must develop RTOC plans and submit revised baselines by 30 June 1999.

\s\  
Ronald J. Rosenthal  
Head, Cost Department

**Cost Department  
Total Ownership Cost Representatives**

AIR-4.2 301 342-0242  
Available by request to NAVIAR personnel.

Enclosure (1)

**See Appendix I of this Guidebook for Complete Text of Naval Air Systems Command Memo Dated 31 Jul 98; Subj: Implementation of Total Ownership Cost Baselines in the Naval Air Systems Command**

Enclosure (2)

ATTENDEES -TOTAL  
OWNERSHIP COST  
INQUIRIES MEETING

**12 NOV 98**

AIR-4.2 301 342-0242  
Available by request to NAVAIR personnel.

Enclosure (3)

**COST DEPARTMENT POC's**

AIR-4.2 301 342-0242

Available by request for NAVAIR personnel.

**COST DEPARTMENT O&S COST ANALYSTS**

AIR-4.2            301 342-0242

Available by request for NAVAIR personnel.

## **Appendix C - TOC Templates**

## **TOC Templates**

The following templates are provided for use in meeting the requirements established in the 5 May 98 ASN(RDA) memo for program cost baselines, specific reduction initiatives, and developing metrics which measure progress towards achieving stated cost goals. The templates are available in MS EXCEL 5.0 format for distribution.

### **BASELINE TEMPLATE – SEE PAGE C-4**

The TOC Program Baseline template is provided as a standardized time-phased summary of the programs life cycle cost elements (Development, Production, Operating & Support, and Disposal) plus those additional direct and indirect cost encompassed by the TOC definition. The template contains a “Prior” year column which allows the user to input a summation of program cost incurred to date. The next column contains the first fiscal year of a ten year window and can be overwritten to adjust the period of time of interest. Following the ten fiscal year columns is a “To Complete” column to capture the remaining life cycle costs of the program beyond the ten years shown. Cost input must be done in current fiscal year dollars to normalize for inflation.

### **REDUCTION INITIATIVES SUMMARY – SEE PAGE C-5**

The Reduction Initiatives Summary template is provided as a standard format for articulating which initiatives are actively underway as well as a one-line narrative description of each. Other Potential Initiatives can also be displayed here for additional initiatives which may be available given additional investment cost or implementation planning.

### **INVESTMENT/COST AVOIDANCE VIEW – SEE PAGE C-6**

The purpose of this template is to convey the cost and associated benefit of each initiative in a time-phased view. Investment costs are input for each year where there is a requirement and projected cost avoidance is input in each year expected. The spreadsheet then calculates the cumulative net cost avoidance associated with each initiative. This allows one to see when the cumulative projected cost avoidance will overcome the initial investment cost. This then is the break even date for that initiative.

The template is divided into two sections: 1) the top section is for active initiatives and 2) the bottom section is for other potential initiatives as defined on the reduction initiatives summary.

## INITIATIVE COST REDUCTION TEMPLATE – C-7

This worksheet contains the detailed information for each initiative. The following fields are input here:

- Program
- Code of Submitter
- Title
- Summary Description
- Initiative Type: Affordable Readiness or CAIV
- Work Unit Codes Affected
- Readiness Affect
- Return on Investment
- Planned Start Date
- Break Even Date

**Program X Total Ownership Cost  
(TOC) Program Baseline**

<b>Cost Profile (Current) in FY99\$M:</b>	<b>Prior</b>	<b>FY 1999</b>	<b>FY 2000</b>	<b>FY 2001</b>	<b>FY 2002</b>	<b>FY 2003</b>	<b>FY 2004</b>	<b>FY 2005</b>	<b>FY 2006</b>	<b>FY 2007</b>	<b>FY 2008</b>	<b>To Complete</b>	<b>Totals</b>
<b>Development Phase</b>	<b>6,521</b>	<b>460</b>	<b>209</b>	-	-	-	-	-	-	-	-	-	<b>7,190</b>
<b>Production Phase</b>													
- Flyaway	1,944	1,932	1,890	1,848	1,634	1,428	1,230	972	960	948	702		15,488
- Support/Spares	680	618	567	517	425	414	381	321	336	332	246		4,837
<b>Total</b>	<b>2,624</b>	<b>2,550</b>	<b>2,457</b>	<b>2,365</b>	<b>2,059</b>	<b>1,842</b>	<b>1,611</b>	<b>1,293</b>	<b>1,296</b>	<b>1,280</b>	<b>948</b>	-	<b>20,325</b>
<b>Operating &amp; Support</b>	<b>34</b>	<b>59</b>	<b>133</b>	<b>205</b>	<b>293</b>	<b>371</b>	<b>428</b>	<b>484</b>	<b>529</b>	<b>540</b>	<b>540</b>	<b>11,340</b>	<b>14,956</b>
<b>Demilitarization &amp; Disposal</b>											3	10	13
<b>Total Life Cycle Cost</b>	<b>9,179</b>	<b>3,069</b>	<b>2,799</b>	<b>2,570</b>	<b>2,352</b>	<b>2,213</b>	<b>2,039</b>	<b>1,777</b>	<b>1,825</b>	<b>1,820</b>	<b>1,491</b>	<b>11,350</b>	<b>30,236</b>
<b>Additional TOC Elements</b>	<b>1,770</b>	<b>864</b>	<b>865</b>	<b>801</b>	<b>787</b>	<b>790</b>	<b>773</b>	<b>731</b>	<b>768</b>	<b>773</b>	<b>683</b>	<b>8,959</b>	<b>15,930</b>
<b>Total Ownership Cost</b>	<b>10,949</b>	<b>3,933</b>	<b>3,664</b>	<b>3,371</b>	<b>3,139</b>	<b>3,003</b>	<b>2,812</b>	<b>2,508</b>	<b>2,593</b>	<b>2,593</b>	<b>2,174</b>	<b>20,309</b>	<b>46,166</b>

<b>Inventory Profile (Current):</b>													
<b>Total Production Units</b>	36	42	42	42	38	34	30	24	24	24	18		<b>276</b>
<b>Total Operating Aircraft</b>	10	26	59	91	130	165	190	215	235	240	240		<b>1,565</b>
<b>Total Operating Hours</b>	4,500	7,800	17,700	27,300	39,000	49,500	57,000	64,500	70,500	72,000	72,000	1,512,000	<b>1,981,500</b>

## Program X Total Ownership Cost Reduction Initiatives Summary

URT-99 Battery Replacement	Replace the current alkaline batteries in the URT-99 with longer life lithium batteries to increase battery life while decreasing inspections/replacements
Bearing Improvement to Turbine Starter	Replace present bearing with more durable material to increase bearing life reducing depot level repairable cost and maintenance labor.

***OTHER POTENTIAL INITIATIVES:***

Improved Manufacturing Process	Use new production approach to reduce materials, assembly time, and tooling requirements. (see Note 1)

**NOTES:** 1 Requires additional Non-recurring engineering costs. Break even point estimated at sixth aircraft.

**Investment/Cost Avoidance View  
Program X  
In Constant FY99 \$K**

*FUNDED INITIATIVES:*

	FY	Prev. Cum.	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	To Compl.	Total
<i>URT-99 Battery Replacement</i>														
			Start Date: FY1999			End Date: FY2012			Break Even Date: FY2000					
Investment	-	-	375	100	30	30	30	30	30					595
Projected Cost Avoidance	-	-	-	730	587	591	459	384	335	342	255		3,825	7,508
Cumulative Net	-	-	(375)	255	812	1,373	1,802	2,156	2,491	2,833	3,088		6,913	
<i>Bearing Improvement to Turbine Starter</i>														
			Start Date: FY1999			End Date: FY2012			Break Even Date: FY2001					
Investment	-	-	20	10	5	-								35
Projected Cost Avoidance	-	-	-	16	30	42	53	53	53	53	53		265	618
Cumulative Net	-	-	(20)	(14)	11	53	106	159	212	265	31		583	
			Start Date:			End Date:			Break Even Date:					
Investment	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Projected Cost Avoidance	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cumulative Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Totals</b>														
Investment	-	-	395	110	35	30	30	30	-	-	-	-	-	630
Projected Cost Avoidance	-	-	-	746	617	633	512	437	388	395	308		4,090	8,126
Cumulative Net	-	-	(395)	241	823	1,426	1,908	2,315	2,703	3,098	3,046		<b>7,496</b>	*

*UNFUNDED INITIATIVES:*

<i>Improved Manufacturing Process</i>														
			Start Date: FY1999			End Date: FY2008			Break Even Date: FY2000					
Total Investment Required	-	-	195											195
Projected Cost Avoidance	-	-	182	727	654	654	654	654	654	654	654		1,164	6,651
Cumulative Net	-	-	(13)	714	1,368	2,022	2,676	3,330	3,984	4,638	5,292		6,456	
			Start Date:			End Date:			Break Even Date:					
Investment	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Projected Cost Avoidance	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cumulative Net	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Totals</b>														
Investment	-	-	195	-	-	-	-	-	-	-	-	-	-	195
Projected Cost Avoidance	-	-	182	727	654	654	654	654	654	654	654		1,164	6,651
Cumulative Net	-	-	(13)	714	1,368	2,022	2,676	3,330	3,984	4,638	5,292		6,456	

Note: \* For the purpose of establishing the TOC program objective, the Cumulative Net Cost Avoidance line from the Totals section of the planned initiatives should be used. The Cumulative Net Cost Avoidance from the Other Potential Initiatives section above are for information purposes only and should not be included.

## Total Ownership Cost Initiative Cost Reduction Template

**Program:** \_\_\_\_\_ **Code of Submitter:** \_\_\_\_\_  
**Initiative Title:** \_\_\_\_\_  
**Initiative Summary Description:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

<u>Initiative Type:</u>	<u>CAIV</u>	<u>WBS / Work Unit Codes Effected:</u>	<u>Readiness Effect:</u>
Affordable Readiness	CAIV	_____	
Unit Prod. Change	Modification	_____	Increase
Log Acquisition Change	Obsolescence	_____	Decrease
Maint Concept	IPT/CS	_____	No Change
	S	_____	
Rel. Improvement	CIP	_____	
Rightsourcing	Other	_____	
<b>Return on Investment:</b>	<b>ROI Ratio:</b>	<b>Planned Start Date:</b>	<b>Break Even Date:</b>

### Projected Profile in FY1999 \$K

**Investments:**

	FY	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	To Complete	Total
<b>RDT&amp;E</b>													-
APN													-
WPN													-
OPN													-
O&MN													-
MILCON													-
Other													-
<b>Total Investment Required</b>													-

**Projected Cost Avoidance:**

<b>Development Phase</b>													
- Direct													-
- Additional TOC Elements													-
<b>Total</b>													-
<b>Production Phase</b>													
- Flyaway													-
- Support/Spares													-
- Additional TOC Elements													-
<b>Total</b>													-
<b>Operating &amp; Support</b>													
- O-Level Personnel													-
- Intermed. Maint.													-
- Fuel/POL													-
- Consumable/AFM													-
- AVDLR													-
- Depot Maint.													-
- Modifications													-
- Other Direct O&S													-
- Linked Indirect													-
- Indirect Support/CLS													-
<b>Demilitarization &amp; Disposal</b>													-
<b>Total Cost Avoidance</b>													-
<b>Net Present Value</b>													-
<b>NPV ROI</b>													-

Note:  
 Complete only those elements impacted by specific initiative. For initiatives currently underway, detailed breakout of investment and cost avoidance is not required if unavailable.

## **Appendix D - TOC Cost Element Structures**

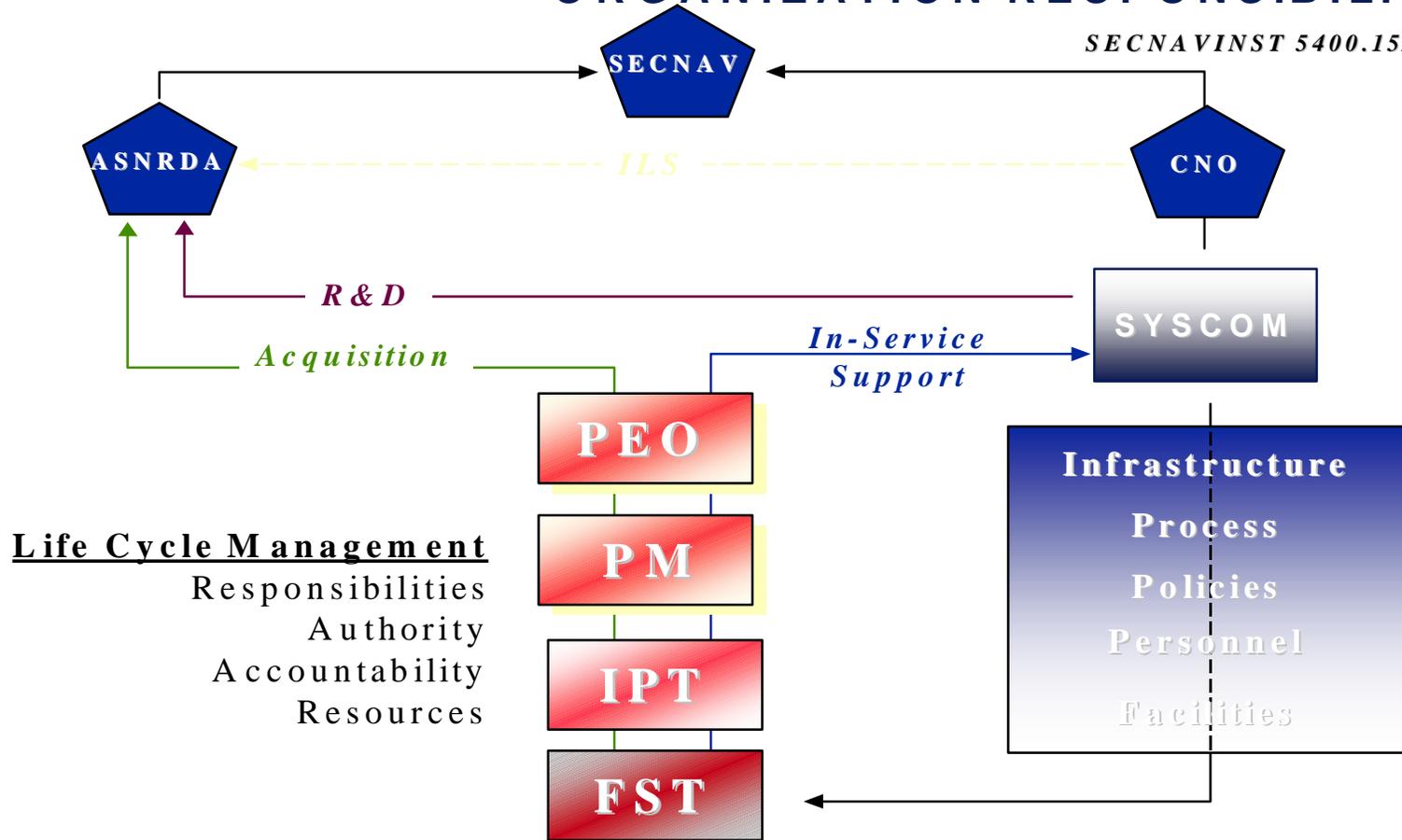
## **TOC Cost Element Structures**

TOC Cost Element Structures for AIRCRAFT, ELECTRONICS, AND WEAPONS are discussed at the NAVAIR web site (<http://www.navair.navy.mil/TOC/>).

## **Appendix E - Organizational Responsibilities**

# ORGANIZATION RESPONSIBILITIES

SECNAVINST 5400.15A (Modified)



# WHO DOES WHAT?

- **PEOs**
  - Hold PMs accountable for Total Ownership Cost
    - and Life Cycle Support
      - ~ Particularly for Operating & Support Costs
  - Provide Management Guidance / Attention
  - Monitor / Track Overall Progress
  
- **PMs**
  - Develop TOC Reduction Plans
    - ~ Set Specific Reduction Targets & Goals
    - ~ Define Measures for Tracking (Metrics)
    - ~ Track Progress against Goals
  - Make Investment Trade-offs
    - ~ LECP/ Cumbersome Work Practices / Engineering for Reduced Maintenance / etc.
    - ~ Set Priorities
  - Direct Actions / Investment Analysis
  - Report Actions Taken / Results
    - ~ Program Manager Reviews/Logistics Management Reviews
  - Obtain Fleet Feedback - How is my System Performing?
    - ~ Operational
    - ~ Cost

# WHO DOES WHAT?

- **Fleet Support Team - Perform Analysis / Develop Actions**
  - Identify TOC Reduction Initiatives
    - ~ Reliability Centered Maintenance / Engineering for Reduced Maintenance
    - ~ Investments (ECP / LECPs, COSSI, etc.)
    - ~ Process Improvements
      - Phased Depot Maintenance / Reduced Overhaul Cycle
    - ~ Maintenance Plan Review / Update
      - Flexible Sustainment - Triggers
    - ~ Innovative Support Solutions
      - Commercial Initiatives
  - Interface with Fleet
    - ~ Identification of Problems
    - ~ Understanding of Usage's / Costs
    - ~ Development of Solutions (Systems Long-Term View)
- **Fleet**
  - Operate and Maintain aircraft, ship, and ship systems
    - ~ Execute Maintenance Plan
    - ~ Maintain Material Condition
  - Understand and Monitor System Performance
    - ~ Readiness
    - ~ Cost
  - Work with FST
  - AVOID Sub-optimization

# WHO DOES WHAT?

- **Depots**

- Execute Depot Portion of Maintenance Plan (SDLM / PDM Specifications / Overhaul / SRA / Fleet Modernization)
- Collect Data
  - ~ PEO/PM
  - ~ Material Condition (RCM)
- Provide Results (Effectiveness)
- Monitor Product Quality

- **NAVICP**

- Responsible for Supply Support Infrastructure
  - ~ Understand Cost
  - ~ Reduce Inventory (where appropriate)
- Cost Reduction Initiatives
  - ~ Direct Vendor Deliveries
  - ~ LECP Program
  - ~ Flexible Sustainment / Trigger Based Item Management

# WHO DOES WHAT?

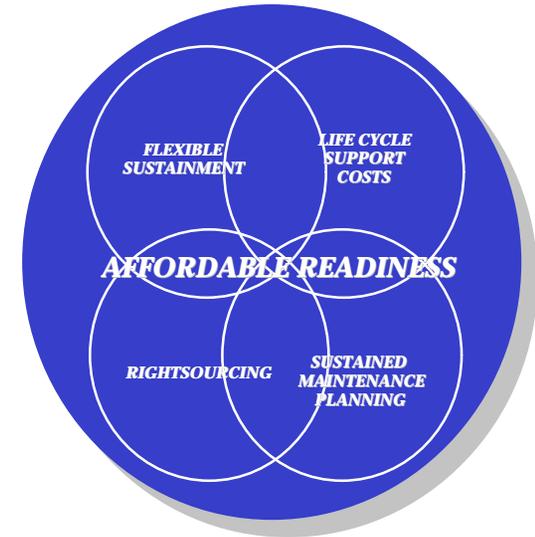
- **OPNAV**
  - Define / Set Policy
    - ~ Resource Sponsor / Financial Policy
    - ~ Track Savings
    - ~ Ensure Savings are Reinvested in Aircraft, Ship and Ship Systems
    - ~ Operating / Flying / Steaming Hour Program
      - Modernization
      - Recapitalization
  
- **SYSCOM**
  - Provide Logistic Support Process
  - Understand / Driving-down Infrastructure Costs
    - ~ Support Equipment
    - ~ Publication / Tech Data
    - ~ Support Organizations
  - Provide Information/Awareness
    - ~ Total Ownership Cost
    - ~ Track Overall Progress against Goals
  - Development & Support of Analysis Processes & Tools
  - Training

## **Appendix F - Information Sources**

# ***INFORMATION SOURCES***

- **Affordable Readiness**

- <http://www.nalda.navy.mil/3.6/coo>



- **Total Ownership Cost**

- <http://www.navair.navy.mil//toc>

- <http://www.navsea.navy.mil/sea017.toc.htm>

- **NAVAIR Processes**

- <http://www.nawcad.navy.mil/processe>

**Appendix G – Affordable Readiness/Total Ownership Cost (ARTOC) Tracking System**

## **AFFORDABLE READINESS / TOTAL OWNERSHIP COST (ARTOC) TRACKING SYSTEM**

The ARTOC application will be a complimentary development to the referenced Affordable Readiness Tracking System (ARTS). Both are AIR-3.0 sponsored systems, which are based on the requirement to reduce the ownership cost of naval aircraft and support systems. ARTS was developed primarily to document and track O&S and non-platform cost issues under the Affordable Readiness (AR) concept. The Total Ownership Cost (TOC) concept is based on Cost As an Independent Variable (CAIV) and covers developing and producing systems from R&D through disposal. TOC also endeavors to encompass all peripheral costs which can be linked to a platform. As a combined system, these two are known as ARTOC.

In the TOC process, the platform-level baseline which is the same as the CAIV Plan, runs through the expected life span of the platform and may be 40 years or more. Since no historical data exists, the baseline is developed through use of a set of cost estimating rules and will be supplied as an input to ARTOC by individual PMAs. This baseline is then used in the calculation of the two primary parameters in TOC, Objective and Threshold.

The point of contact for this activity is, AIR-3.6.2.2, @ 301-757-8908.

**Appendix H – ASN(RD&A) TOC Implementation Letter**



**THE ASSISTANT SECRETARY OF THE NAVY**  
Research Development and Acquisition  
1000 Navy Pentagon  
Washington DC 20350-1000

**May 05 1998**

**MEMORANDUM FOR THE DISTRIBUTION LIST**

**Subj: IMPLEMENTATION OF TOTAL OWNERSHIP COST (TOC)  
BASELINES IN THE DEPARTMENT OF THE NAVY**

**Ref : (a) Navy Acquisition Reform Senior Oversight  
Council meeting of 26 March 1998**

The purpose of this correspondence is to direct the formulation and implementation of formal Total Ownership Cost (TOC) reduction efforts for all Department of the Navy programs regardless of Acquisition Category (ACAT) designation, program dollar value or life cycle stage. Each individual involved in the acquisition, deployment and operational support of all Navy systems has a responsibility to make decisions which consider Total Ownership Cost impacts. We have an obligation to seek out ways to reduce the cost of ownership of current and future systems in order to identify funds which can be used to support the recapitalization and modernization of the Navy.

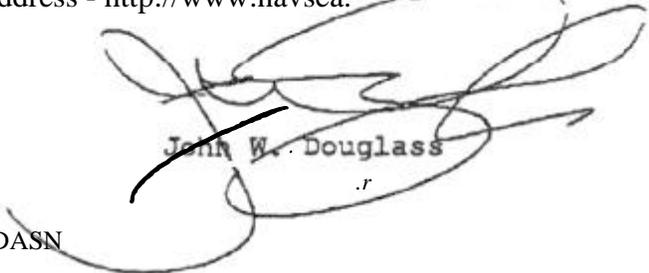
During reference (a), I reviewed, approved and fully endorsed a top level concept for establishing formal Total Ownership Cost reduction plans. Formulation of these plans requires the establishment of a cost baseline, identification of cost drivers within the baseline, developing specific reduction initiatives and developing metrics which measure progress towards achieving stated goals. Each Navy ACAT program will revise their current approved Acquisition Program Baseline and establish a TOC objective and threshold. TOC reduction plans and Acquisition Program Baseline revisions shall be submitted to appropriate Milestone Decision Authority (MDA) for ACAT I/II programs by 31 December 1998, and for ACAT III/IV and Non-ACAT programs by 30 June 1999.

This is a complex effort which will take an integrated approach involving stakeholders from the fleet users, requirements community, acquisition commands, comptroller organizations and others. It is particularly important to have the involvement of the warfare sponsors and the comptroller community in this effort due to the significant impact that TOC reduction efforts will have on future budget planning efforts. Without the participation of the appropriate stakeholders and the active participation of senior leadership, our opportunities for success will be limited. Therefore, I request that you make this effort a priority within your organization. Each Systems Commander shall make reports on implementing TOC programs for efforts under their cognizance at regularly scheduled metrics briefings. This process should be continuous and institutionalized within the Department as a long term cost reduction initiative.

Subj : IMPLEMENTATION OF TOTAL OWNERSHIP COST (TOC)  
BASELINES IN THE DEPARTMENT OF THE NAVY

I urge you all to review the information available on this initiative at the following website address and provide feedback to my focal points for TOC: Mr. Pat Tamburrino, Jr, Naval Sea Systems Command (703-602-1209) and Mr. Ron Rosenthal, Naval Air Systems Command (301-342-2454).

WEBSITE address - <http://www.navsea.navy.mil/sea017/toc> .. htm



John W. Douglass

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**Appendix I – NAVAIR’s TOC Implementation Guidance**

13000  
AIR-4.2.5.1/TOC  
31 Jul 98

MEMORANDUM

From: Deputy Commander For Acquisition & Operations

Subj: IMPLEMENTATION OF TOTAL OWNERSHIP COST BASELINES IN THE  
NAVAL AIR SYSTEMS COMMAND

Ref: (a) ASN(RD&A) memo dated 05 May 1998; subj:  
Implementation of Total Ownership Cost (TOC) Baselines  
in the Department of the Navy

Encl: (1) Guidance for Establishing TOC Objectives and Thresholds

1. This memorandum provides implementation guidance for formulating and documenting Total Ownership Cost (TOC) reduction efforts as required by reference (a). Total Ownership Cost, as defined for the ASN(RD&A) Strategic Plan, includes all costs associated with the research, development, procurement, operation, logistical support and disposal of an individual weapon system *including the total supporting infrastructure that plans, manages and executes that weapon system program over its full life.*

2. Program Cost As an Independent Variable (CAIV) Plans or Affordable Readiness implementation plans will serve as the TOC reduction plan required by reference (a). CAIV and Affordable Readiness Plans need to include: a cost baseline, identification of cost drivers within that baseline, specific cost reduction initiatives, program goals/thresholds, and metrics which measure progress towards achieving stated goals.

3. Each program will use their current approved Acquisition Program Baseline and CAIV or Affordable Readiness Plan to establish a TOC objective and threshold. The TOC objective and threshold will be a single entry in the footnote field in the cost section of the Acquisition Program Baseline (APB). Revised APB's shall be submitted to the appropriate Milestone Decision Authority for ACAT I/II programs no later than 31 December 1998 and for ACAT III/IV programs by 30 June 1999.

4. Enclosure (1) contains specific guidance for establishing TOC baselines, objectives, and thresholds, as well as templates which programs can use to assess initiatives and track progress. The H-60 and JSOW programs are in the process of populating these templates and will provide lessons learned via AIR-4.2. The Cost Department, AIR-4.2, will continue to develop expanded cost element structures to define and allocate the remaining costs

Subj: IMPLEMENTATION OF TOTAL OWNERSHIP COST BASELINES IN THE  
NAVAL AIR SYSTEMS COMMAND

included under TOC during a program's life cycle. For further assistance, please contact your program's AIR-4.2 Cost Team Leader (CTL). If your program does not have a CTL, additional information and other points of contact will be available shortly on the NAVAIR TOC website which will be accessible from the cost department homepage:

[http://www.nawcad.navy.mil/nawcad/rsrch\\_eng/4.2/index.html](http://www.nawcad.navy.mil/nawcad/rsrch_eng/4.2/index.html)

/s/

W. M. BALDERSON

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AIR-3.0, 3.6, 4.0, 4.2, 6.0

PMW/A-187

PMA201, 202, 205, 207, 208, 209, 213, 222, 225, 226, 231, 233,  
234, 241, 242, 248, 251, 257, 258, 259, 260, 261, 263, 264, 265,  
268, 271, 272, 273, 275, 276, 280, 281, 282, 290, 299

PM(TS)

## **GUIDANCE FOR ESTABLISHING TOC OBJECTIVES AND THRESHOLDS**

### **I. General Guidance on TOC Reduction Plans:**

- The narrative description in the TOC reduction plan should address initiatives underway including descriptions of cost reduction goals and investment required to achieve those goals.
- Specific detail should only be provided for those initiatives with firm and realistic plans and estimates.

### **II. General Guidance on TOC Baselines, Objectives, and Thresholds:**

- For pre-milestone III ACAT I-IV programs, show in an updated APB the TOC baseline based upon the program life cycle cost estimate plus the additional items identified below in section III.
- For post-milestone III ACAT I-IV programs, use the same baseline for TOC as that established in the Affordable Readiness plan plus the additional items identified below in section III.
- The TOC objective to be included in the Acquisition Program Baseline document should equal the program TOC baseline less the cumulative net cost avoidance associated with the program's CAIV or Affordable Readiness initiatives.
- Unless otherwise specified, the TOC threshold should then be the TOC objective value plus 10% in accordance with SECNAVINST 5000.2B.
- For those programs involving systems employed on multiple platforms, clearly identify if initiative investment cost or cost avoidance associated with that system are also included in the platform baselines. This is to avoid double counting of potential cost avoidance.
- TOC Baseline should be updated with APB revisions or when major programmatic changes occur.

### **III. TOC items already included in Life Cycle Costs (LCC) estimates:**

- Navy Working Capital Fund (NWCF) personnel.
- Specialty Training for undergraduate pilots and non-pilot aircrew.

- Modifications captured under Affordable Readiness baselines (HONA category A and B type modifications).

**IV. New items that need to be added to LCC estimates:**

- When a program is introducing a new system, common support equipment costs required as result of introducing the new system.
- Programs should take credit for and include in their plans, initiatives that currently exist and are being implemented.
- Core program office Expense Operating Budget (EOB). Include both Civilians and military. Joint program offices need to include ALL services in their headcount. The following rates should be used for this calculation:

HQ Civilians	\$76,927	} FY98\$
Officers	\$79,264	
Enlisted	\$35,741	

- Add Demilitarization and Disposal Costs if and when available (Just cost to get the system to the "desert", not the cost to maintain after that point).

**V. Items that will be added once a collection and monitoring system are in place:**

- Extended Program Team EOB personnel.
- Performance enhancements and new mission modifications (HONA category C) will be included in Development and Production Phase estimates. These modifications often result in a new program designator and their cost should be captured accordingly.

**VI. Items that don't need to be added to LCC estimates:**

- Do not include sunk costs unless readily available. For example, programs do not have to attempt to allocate existing common support equipment to their program.

The templates provided in Attachments (1) through (3) are provided for guidance purposes as a means of displaying the program baseline, summarizing the cost reduction initiatives, and displaying investment requirements and potential cost avoidance in the TOC reduction plans. Attachment (4) is an example worksheet to show, for each initiative:

- the investment required by appropriation,
- projected cost avoidance broken down by cost element, and
- return on investment (ROI).

For acquisition programs, the cost baseline shown in attachment (1) should be the estimate of the program BEFORE the application of initiatives. This will allow to the measurement of progress against old ways of doing business. For in-service programs, the cost baseline will be the same as the affordable readiness baseline including the additional items identified in section IV of enclosure (1).

**Appendix J – Acquisition Program Baseline (APB) Preparation**

## Acquisition Program Baseline Preparation

The Acquisition Program Baseline (APB) document serves as a “contract” between a program’s milestone decision authority (MDA), the resource sponsor, and the program manager as to the major cost, schedule, and performance objectives and thresholds to which the program is being executed. For ACAT I programs, APBs are required by statute; for all other ACAT programs the APB requirement is established in DoD 5000.2R and SECNAVINST 5000.2B.

A program’s initial APB should be prepared at program initiation, with updates submitted for approval prior to each milestone and following any unrecoverable program deviation or program restructure that will require a modification to the previously approved baseline parameter objectives and thresholds. In preparing an APB, the program manager should limit the number of parameters to those which, if not met, could require a reevaluation by the MDA of alternate program concepts or design approaches. Generally, the APB performance parameters are the key performance parameters (KPPs) described in the Operational Requirements Document (ORD). The schedule parameters should be limited to critical system events, including program initiation, milestone decision points, and initial operational capability. The cost parameters should be based on the best available estimates and should reflect total program costs. Depending on the nature of the program, specific cost parameters could address total RDT&E costs, total procurement costs, military construction costs, the cost of acquisition items procured with O&MN funds, the total quantity to be procured, and average unit procurement cost. In addition, ASN(RD&A)’s guidance from 5 May 1998 requires each ACAT program to include a Total Ownership Cost (TOC) objective and threshold among the APB cost parameters.

In establishing objectives and thresholds for APB parameters, the program manager should keep in mind that the objective value is the value desired by the user and which the program manager is attempting to obtain, whereas the threshold is the minimum acceptable value needed to satisfy the need. While the difference between a parameter’s objective and threshold values should be individually set based on the specific characteristics of the program, as a general rule schedule parameter thresholds should be no more than the objective value plus six months, and cost parameter thresholds should be no more than the objective value plus ten percent. Unless specified as a different value, the threshold value for a performance parameter is the same as the objective value. Guidance for establishing objectives and thresholds is found in section 2.3 of DoD 5000.2R and section 3.2.1 of both DoD 5000.2R and SECNAVINST 5000.2B.

The TOC parameter objective should equal the program TOC baseline less the cumulative net cost avoidance/savings associated with the program’s CAIV or Affordable Readiness initiatives. Unless otherwise specified, the TOC threshold value is the objective value plus ten percent. Additional guidance on establishing TOC baselines and TOC APB objectives and thresholds can be found in Appendix F of this guidebook (AIR-1.0 memo 13000 AIR-4.2.5.1/TOC of 31 Jul 98).

Additional guidance on preparing and staffing APBs is contained in section 3.2.2 of both DoD 5000.2R and SECNAVINST 5000.2B, and in enclosure (7), Appendix II, Annex A, section 4 of SECNAVINST 5000.2B.

**Appendix K – Affordable Readiness (AR) and AR Plan Preparation**

## NAVAIR AFFORDABLE READINESS - ABSTRACT

### What is Affordable Readiness?

**Affordable Readiness (AR)** is a concept of operations whereby platform/equipment/competency managers are required to continuously seek and implement opportunities to reduce life cycle support (operating/ support/ infrastructure) costs, while sustaining the fleet readiness and safety of applicable aircraft and equipment. The intention is that the savings from such reductions are to be reinvested in Naval Aviation modernization and re-capitalization.

**AR** requires a change in our “way of doing business.” This starts with Program planning. NAVAIR requires that all PMAs and Level 2 Competency Managers develop and sustain **AR Plans** describe the following in detail:

- a. Application of the **AR** concept to their weapons system/equipment/competency – including cost reduction targets and goals
- b. Methodology/process for selection of readiness and cost improvement targets and candidates
- c. Specific initiatives planned and underway to achieve cost reductions while sustaining required levels of readiness and safety
- d. Specific metrics which measure progress

### In the beginning...

Implementation of the **AR** concept was formally initiated in FY 96. It began with both a NAVAIR-wide analyses of operating, support & infrastructure costs, and an inventory of analysis tools & processes that support cost reduction efforts.

Once the cost analyses and tool/process inventory were completed, COMNAVAIRSYSCOM directed that the tenets of **AR** be applied to all In-Service aircraft and equipment (post Milestone III of the Life Cycle). Then program teams drafted **AR Plans** and reported progress toward reducing operating and support (O&S) costs at scheduled reviews. Guidance on the **AR** concept of operation was provided to the program teams outlining activities that they should address and include in their **AR Plans** and initiatives.

### The current phase, TOC...

Since NAVAIR began implementing **AR**, additional guidance and direction from both the Department of the Navy (DoN) and Department of Defense (DoD) on Total Ownership Cost Reduction has been released. **Total Ownership Cost (TOC)**, as defined for the ASN(RD&A) Strategic Plan, includes all costs associated with the research, development, procurement, operation, logistical support and disposal of an individual weapon system including the total supporting infrastructure that plans, manages and executes that weapon system program over its full life.

**TOC** reduction is not a Navy-only effort, it is a DoD-wide issue. The Air Force, for example, has a formally established **TOC** Program Office. But one thing should be kept in mind, both ASN(RD&A)'s TOC directive and the DoD thrust has been based upon the NAVAIR's AR. A simplistic view is that TOC reduction is the overall umbrella (the noun as the ASN(RD&A) Goal

## NAVAIR AFFORDABLE READINESS – ABSTRACT (Cont'd)

Management board likes to refer to it), and **AR** is the process for implementation for Life Cycle Support/In-service programs - while the application of **Cost As an Independent Variable (CAIV)** and COPT is the process for R&D/Pre-production programs.

On 5 May 98 ASN(RD&A), Mr. John Douglas, signed out a memorandum, subject: "Implementation of Total Ownership Cost (TOC) Baselines in the Department of the Navy". The first sentence of that memo reads: "The purpose of this correspondence is to direct the formulation and implementation of formal **TOC** reduction efforts for all Department of the Navy programs regardless of Acquisition Category (ACAT) designation, program dollar value or life cycle stage." The memo goes on to establish the requirement for establishing approved **TOC Reduction Plans** and **Acquisition Program Baseline** revisions by 31 Dec 98 for ACAT I/II and 30 June 99 for ACAT III/IV & Non-ACAT programs.

Within NAVAIR, a program's CAIV Plan or **AR Plan** will serve as the **TOC** reduction plan required by the reference memorandum.

### What does the Program Team do?

The current NAVAIR **AR** guidance in place is based on the premise that program teams, either directly or indirectly, influence operating and support costs during all phases of a weapon system's life cycle. This influence is not derived from direct control of all funds related to O&S, rather it stems from the program team's knowledge and understanding of their equipment performance and cost drivers. This in turn leads to the ability to identify opportunities to provide greater (or sustain) equipment reliability and/or availability, modify logistics support and/or maintenance concepts, and sustain required readiness & safety levels all at lower costs. Once an opportunity has been identified, the program teams then need to review the myriad of potential initiatives and determine the best course of action for their program.

In addition, the complexity of **AR** initiatives and decisions mandates extensive coordination with fleet, OPNAV staffs, and other stakeholders.

### Where do we Attack?

The four major areas of cost which should be addressed in **AR Plans** are:

**Inventory:** Aircraft, engines, spares, support equipment, and training devices

**Manpower:** military, civil service, and contractor

**Technical Data:** publications, engineering drawings, software, etc.

**Infrastructure:** buildings, facilities, test and evaluation equipment, production tooling/fixtures

### What should be in a Plan?

In order to standardize **AR Plan** content and consistency, NAVAIR has developed and issued via the **AR** website ([www.nalda.navy.mil/3.6/coo](http://www.nalda.navy.mil/3.6/coo)) the following templates:

## NAVAIR AFFORDABLE READINESS – ABSTRACT (Cont'd)

**Historical Cost Trends:** A five-FY display of O&S cost and program support cost elements plus aircraft inventory/flight activity if applicable.

**Cost Relationships:** A display of cost element % of total for **AR Plan** base year plus a matrix describing which cost element(s) are addressed by specific initiatives in the **AR Plan**.

**Program Baseline:** A ten-FY projection of program costs (expressed in current FY dollars) plus an aircraft inventory and flight activity projection if applicable. This baseline should reflect projected costs assuming none of the planned **AR** initiatives are implemented.

**Initiative Summary:** A title and brief description of all active **AR** Initiatives included in this **AR Plan**

**Initiative Investment/Cost Avoidance Roll-up:** A ten-FY display of each active and potential **AR** initiative contained in this **AR Plan** showing investment, projected cost avoidance and cumulative net by FY with totals by **AR** initiative and by FY.

**Initiative Profile:** Prepare for each active and potential **AR** initiative included in the **AR Plan**. This profile includes the following information:

- Initiative title, summary description and date prepared

- Initiative Type/Status

- Work Unit Codes of affected systems

- Readiness impact

- Return on investment (ROI ratio, planned start date, break-even date)

- Ten FY projected investment profile by FY and appropriation

- Ten FY projected cost avoidance profile by FY and cost element

- Total cost avoidance by FY for 10-year profile

The **AR Plan** is intended to be a continuously updated description of a Program Team's or Competency's areas of attack, actions, and achievements in meeting the **AR** goals of continuous reductions in life cycle support costs while sustaining required readiness. The Program Team or Competency must have in place a process whereby proposed **AR** initiatives are identified, scoped, evaluated, and added to the **AR Plan**; and this includes initiatives that are either being held, canceled, or implemented. Tracking of achievements of the **AR** initiatives is the responsibility of the Program Team or Competency. Such progress shall be reported with-in the Annual Operating Plan (AOP) execution process with a quarterly report frequency and roll-ups by PEO and level one competency.

# AFFORDABLE READINESS INITIATIVE INSTRUCTIONS

## **COST INSTRUCTIONS FOR O&M,N BOARD AFFORDABLE READINESS**

### **1. PURPOSE**

This document provides guidelines for developing, documenting, and presenting Affordable Readiness cost analyses and estimates to be presented to the O&M,N Review Board. The primary objective of the guidance is to achieve comprehensive, consistent, well-documented cost estimates that can be replicated and verified by an independent party. The objective is also to provide sound, executable foundations for identifying cost savings associated with Affordable Readiness initiatives.

### **1.1 O&M,N BOARD AFFORDABLE READINESS GROUND RULES**

The following ground rules should be adhered to for any/all cost estimating studies performed for Affordable Readiness purposes:

- **Constant Year Dollars:** Dollars based on the current Fiscal Year economics shall be used for Affordable Readiness studies. Guidance on inflation indices used to normalize historical cost data to a FY99 Constant Dollar is provided in Table 1 and the Inflation Indexing Tool.
- **Aircraft/System/Equipment Usage:** For In-Service hardware, aircraft/equipment usage including number of operating units, usage hours and aircraft/engine rework quantity requirements shall be consistent with the current Affordable Readiness baseline documents.
- **Treatment of Sunk Costs:** Sunk costs, or costs already incurred prior to the Affordable Readiness decision point, are not to be included in the analyses.
- **Billet Cost Savings:** Labor cost savings are most accurately projected when full billets can be removed from manning structures.
- **Other Man Hour Labor Cost Savings:** For direct military labor hour reductions, the following costs per hour (FY99\$) shall be used.

#### **Unburdened Direct Labor**

<b>“O” Level</b>	<b>\$16.16</b>
<b>“T” Level</b>	<b>\$20.07</b>

- **Time Phasing of Costs:** Cost phasing must be based upon achievable and budget executable forecasts for both investments and savings streams. In the cases of ECPs or LECs, projections of savings cannot begin until executable modification installations or spares demands have occurred that will generate a savings compared to the previous equipment.
- **ROI calculations:** Return on Investments is automatically calculated on the Initiative profile spreadsheet using the investments and identified savings identified on the form.
- **Net Present Value Determination:** The Affordable Readiness Templates will also calculate a Net Present Value which is derived by adjusting the cash flows by year times a percentage adjustment that reflects the cost of the United States Treasury to borrow money. The 1998 Discount Rate is 3.6% The present value formulation leads to a compounding situation wherein dollars ten years in the future have significantly less “value” than current dollars.

## **1.2 DEVELOPMENT OF POA&M FOR EXECUTION OF INITIATIVE**

Affordable Readiness Initiatives need to be based upon clearly defined Plans of Action and Milestones. To ensure executability of proposed initiatives prepare a summary POA&M containing the following information. Please note that the forecasts of savings should be synchronized with the milestones contained in this POA&M.

- Identify key tasks associated with implementing the initiative including both actions associated with implementing the initiative and schedules for the implementation actions that lead to savings.
- Identify by task those tasks done in-house and those done by external contractors or contractor support organizations.
- Identify task duration against an execution timeline, which should take the initiative out into that future timeframe where the initiative is fully implemented in the fleet.

## **1.3 ESTIMATING APPROACH FOR MAINTENANCE DRIVEN COSTS**

To evaluate the potential cost savings or cost changes associated with an Affordable Readiness cost analysis study it is important that a foundation be constructed based on the current costs of a fielded system. Even in the case of a study wherein an Engineering Change Proposal (ECP) or Logistics Engineering Change Proposal (LECP) is being proposed, the current system shall be the baseline. The overall approach to be used in developing the maintenance related Operations and Support costs for an Affordable Readiness cost analysis study is as follows:

### **1. Develop an Affordable Readiness cost analysis cost study baseline:**

- a. Identify an analogous fielded system with recent maintenance history;
- b. Identify the level (system, WRA, SRA or lower) that the data needs to be collected based upon the Affordable Readiness cost analysis being proposed.
- c. Using VAMOSC AMSR, LMDSS or NALDA data systems construct a three year history of expended maintenance costs that address “O” and “I” level labor costs, maintenance consumable materials and component repairs (Aviation Depot Level Repairables) at the level determined above.
- d. Convert Navy organic reported labor costs into the Affordable Readiness Unburdened Labor Costs using the Ratio of VAMOSC/LMDSS Labor Rates and the Affordable Readiness rates referenced in Section 1.1 above
- e. Inflate all historical costs to a constant year dollar base using the current approved inflation guidance referenced in the Inflation Indexing Tool.
- f. Convert these costs into an average cost per flying or usage hour which becomes the trade study baseline.

### **2. Identify those conditions impacting maintenance that change based upon the recommended Affordable Readiness cost analysis study approach:**

- a. Identify complexity/cost differences from the new system (if an ECP) that would drive costs;
- b. Identify any R&M changes that would result from recommended approach;
- c. Identify maintenance level changes that result in changes to how maintenance is done, source of maintenance and/or level of maintenance;

d. Identify any other changes that will impact the historical cost baseline.

**3. Using the information provided in steps 1 and 2 above, develop a clearly documented and auditable approach showing the track from current system costs to those associated with the proposed change in equipment, processes or labor source that are associated with the specific Affordable Readiness study. Quantify those savings in each category used in the baseline including the decreases in labor content expressed as dollars.**

#### **1.4 COST METHODOLOGY DOCUMENTATION REQUIREMENTS**

Documentation requirements are summarized below. Documentation shall be limited to no more than four pages (in addition to the required spreadsheets) that succinctly and accurately provide the information required below. The attached format template reflects relative space requirements for each area.

- **Documentation of Assumptions:** All critical assumptions shall be documented that drive the results of Affordable Readiness Studies. Where critical costs are based on assumptions, identify why the assumptions are reasonable and credible. Included herein should be the planned execution schedule and associated assumptions.
- **Documentation of Historical Baselines:** The following information shall be provided to document historical baseline preparation:
  - **Data Sources:** Describe Data Sources used to build historical baselines along with any adjustments (including rationale for those adjustments) made to the data.
  - **Inflation Adjustment:** Identify source years of data and how data adjusted to FY99 constant dollars.
  - **Usage/Maintenance Requirements:** Identify any critical usage and maintenance related requirements and/or anomalies that have occurred during the Historical Baseline Data Years and how these were accounted for in the baseline.
- **Documentation of Projected Costs:** The following information shall be provided to describe/document the 10 Year Forward Cost Projection Estimates:
  - **Methodology Overview:** Provide an explanation covering how the out year projections were done with additional explanations describing:
    - ⇒ **Data Sources:** Identify source and credibility of acquisition related cost estimates (contractor proposals, comparisons to analogous systems, etc) and source for out year usage projections
    - ⇒ **Estimating Models:** Identify Estimating Model(s) used.
    - ⇒ **Cost Drivers:** Identify the cost information that drove the initiative results and the basis for those projections (i.e. R&M improvements, application of RCM logic to Depot Rework, reduced repair costs by changing repair source or philosophy, etc.)
    - ⇒ **Cost Avoidance (Savings):** Identify the man hours or other units upon which identified savings are based as well as the costs. Clearly identify how costs were derived.
- **Tabular Presentation of Results:** Results of the analysis shall be summarized in a table that shows “as-is” cost streams and Affordable Readiness Cost Streams for the affected cost elements.

## 1.5 RISK IDENTIFICATION REQUIREMENTS

**Risk Analysis:** The proposal shall contain a narrative that addresses Risk associated with the proposed Affordable Readiness Initiative using the following Format:

**Risk Category:** {Description} **Risk Metric:** {Low, Medium or High}  
**Short Rationale for Risk Level Identified:**

Mandatory Risk areas to be addressed include:

**Potential Benefit:** Is there enough service life and overall system population to warrant the change. Will the impacted system(s) be in the inventory for a sufficient time frame for the benefits to be realized?

**Technical Risk:** Is there technology insertion or maturation effort involved that involves risk or a redesign process with unknown results? Has this initiative been proven on another program or in the commercial arena?

**Schedule Risk:** Are there schedule issues or assumptions that make the likelihood of successful execution a higher risk?

**Funding Risk:** Are funds other than those O&M,N dollars requested for this study necessary for successful execution? If so is there risk in obtaining those funds?

**Traceability Risk:** Identify how cost avoidances will be tracked to document savings realized.

## 1.6 COST STRUCTURE

When studying an Affordable Readiness Initiative concept's life cycle cost, the greatest amount of effort should be expended on the cost elements that account for largest portions of cost and are Affected by the Affordable Readiness Initiative's acceptance. Table 2 provides a recommended Cost Estimating Structure for use in Affordable Readiness Studies. It also provides information on which cost categories are the primary cost drivers by bolding those elements that normally will provide the greatest costs or cost savings. It should be noted that Acquisition and Acquisition ILS elements are only applicable if an Affordable Readiness Initiative involves new procurement or has logistics support system acquisition impacts. In almost all cases the identified Operations and Support cost drivers will be impacted in any initiative study and must be evaluated. Those additional Acquisition and Operations and Support Elements that are not bolded should be evaluated for a total cost perspective and may become critical given the scope of the specific initiative being evaluated. The Cost Elements and Cost Drivers are summarized in the matrix provided in Table 2.

## TABLE 1: INFLATION FACTOR GUIDANCE

### APPLICATION OF INFLATION FACTORS

<u>Cost Element</u>	<u>Inflation Index</u>
Personnel	MPN COMPOSITE
Petroleum, Oil, and Lubricants (POL)	Fuel
O & I Maintenance Consumables	OM&N (PURCHASES)
Aviation Depot Level Repairables (AVDLRs)	OM&N/LF (COMP)
Training Expendables	WPN
Aircraft Overhaul/Support	OM&N/LF(COMP)
Engine Repair/Rework	OM&N/LF(COMP)
Support Equipment Maintenance	APN
Support Equipment Maintenance	OM&N/LF(COMP)
Modifications	APN
CETS/NETS	OM&N/LF(COMP)
Software Maintenance	OM&N/LF(COMP)

Current Inflation Tables and Guidance contained in the Naval Center for Cost Analysis Web Site: (<http://www.ncca.navy.mil/>).

**TABLE 2: COST ESTIMATING STRUCTURE**

Category Title	Cost Category Description
<b>End Item Aqn Costs:</b>	Costs Associated with Design and Production and Acquisition ILS
<b>Design</b>	<b>Non-Recurring Design</b>
<b>Production</b>	<b>Recurring Production of End Item</b>
<b>Installation</b>	<b><i>Installation Costs if APN Funded</i></b>
<b>ILS Costs:</b>	
Maintenance Planning	LSA and Maintenance Plan Development
<b>Supply Support</b>	<b><i>Initial Spares and Repair Parts</i></b>
<b>Support Equipment</b>	<b><i>Peculiar Support Equipment</i></b>
Tech Data	Technical Publications and Data
<b>Training</b>	<b><i>Training and Training Devices</i></b>
<b>O&amp;S Costs:</b>	
1.0	Costs Associated with Operating and Maintaining Fielded Equipments
1.1	MISSION PERSONNEL
1.2	OPERATIONS PERSONNEL (PILOTS/AIRCREW) MAINTENANCE PERSONNEL (“O” LEVEL LABOR)
2.0	UNIT-LEVEL CONSUMPTION
2.1	<b>POL/ENERGY CONSUMPTION</b>
2.2	<b><i>CONSUMABLE MATERIAL/REPAIR PARTS</i></b>
2.3	<b>DEPOT LEVEL REPAIRABLES (AVDLRS)</b>
2.4	TRAINING MUNITIONS/EXPENDABLE STORES
2.5	OTHER
3.0	INTERMEDIATE MAINTENANCE
3.1	MAINTENANCE PERSONNEL ( “T” LEVEL LABOR)
3.2	CONSUMABLE MATERIAL/REPAIR PARTS
3.3	OTHER
4.0	DEPOT
4.1	<b>OVERHAUL / REWORK FOR AIRCRAFT AND ENGINES</b>
4.2	EMERGENCY REPAIR
5.0	<b><i>CONTRACTOR SUPPORT</i></b>
6.0	SUSTAINING SUPPORT
6.1	SUPPORT EQUIPMENT REPLACEMENT
6.2	<b>MODIFICATION KIT PROCUREMENT / INSTALLATION</b>
6.3	OTHER RECURRING INVESTMENT
6.4	SUSTAINING ENGINEERING SUPPORT
6.5	SOFTWARE MAINTENANCE SUPPORT
6.6	SIMULATOR OPERATIONS

**AFFORDABLE READINESS INITIATIVE**

(Initiative Title)

O&MN BOARD ID:

(Program Sponsor - Name/Code/Phone) \_\_\_\_\_

(Initiative Submitter - Name/Site/Code/Phone) \_\_\_\_\_

Proposed Investment Cost: \_\_\_\_\_

O&MN Budget Sub-Activity: \_\_\_\_\_

**AFFORDABLE READINESS INITIATIVE**

**Narrative Description of the Initiative:**

**Initiative POA&M Timeline**

Task Description	Oct-98	Mar-99	Oct-99	Mar-00	Oct-00

**COST METHODOLOGY DOCUMENTATION**

**Documentation of Assumptions:**

**Documentation of Historical Baseline:**

**Data Sources:**

**Inflation Adjustment:**

**Usage/Maintenance Requirements:**

**Initiative Baseline:**

Cost Element	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008

**Documentation of Projected Costs/Savings:**

**Methodology Overview:**

**Data Sources Including Rationale:**

**Estimating Models:**

**Cost Driver Identification:**

**Future Cost Projection with Initiative Table:**

Cost Element	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008

**RISK IDENTIFICATION ASSESSMENT:**      **(Low, Medium, High)**  
**Risk Summary:**

**Technical Risk:**

**Schedule Risk:**

**Funding Availability Risk:**

**Traceability Risk:**

**Other Risk:**

**Methodology for Tracking Results:**

**Description of Ability to Execute This Fiscal Year**

**Execution Rationale:**

**INITIATIVE PROFILE BASELINE**

**Program ID:** \_\_\_\_\_

**Code of Submitter:** \_\_\_\_\_

**Program Title:** \_\_\_\_\_

**Cost Profile (Current) in FY 98 \$K:**

	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07
Organizational Personnel										
Intermediate Maintenance										
Fuel										
Consumables										
AVDLRs										
Depot Maintenance										
Modifications										
Sustaining Support										
IPT/CSS										
Indirect Support/CLS										
Other										
<b>TOTAL</b>	-	-	-	-	-	-	-	-	-	-

**Inventory Profile (Current):**

	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07
Quantity Flight/Operating hours										

**INITIATIVE PROFILE**

Program ID: \_\_\_\_\_

Code of Submitter: \_\_\_\_\_

Initiative Title: \_\_\_\_\_

Initiative Summary Description: \_\_\_\_\_  
 \_\_\_\_\_

<b>Initiative Type:</b>		<b>Initiative Status:</b>		<b>Work Unit Codes Effected:</b>		<b>Readiness Effect:</b>		
LECP Analysis	<input type="checkbox"/>	Modifications	<input type="checkbox"/>	Active	<input type="checkbox"/>		Increase	<input type="checkbox"/>
Reliability Improv	<input type="checkbox"/>	Obsolescence	<input type="checkbox"/>	Planned	<input type="checkbox"/>	_____	Decrease	<input type="checkbox"/>
Maint Concept	<input type="checkbox"/>	IPT/CSS	<input type="checkbox"/>	Unfunded	<input type="checkbox"/>	_____	No Change	<input type="checkbox"/>
RCM Analysis	<input type="checkbox"/>	CIP	<input type="checkbox"/>			_____		
Rightsourcing	<input type="checkbox"/>	Other	<input type="checkbox"/>			_____		

**Return On Investment:**  
 ROI Ratio:   #DIV/0!        Planned Start Date: \_\_\_\_\_      Break Even Date: \_\_\_\_\_

**Projected Profile in FY 98 \$K:**

	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	TOTAL
APN/WPN											-
OPN											-
O&MN											-
AG/SAG:											-
AG/SAG:											-
AG/SAG:											-
RDT&E											-
Other											-
<b>Total Investment</b>	-	-	-	-	-	-	-	-	-	-	-
<b>Projected Cost Avoidance</b>											
Org Persnl											-
Intermed Maint											-
Fuel											-
Consumables											-
AVDLRs											-
Depot Maint											-
Modifications											-
Sustaining Spt											-
IPT/CSS											-
Indirect Support/CLS											-
Other											-
<b>Total Cost Avoidance</b>	-	-	-	-	-	-	-	-	-	-	-
<b>Net Present Value</b>											
<b>NPV ROI</b>	#DIV/0!										

## COST ANALYSIS SCORING CRITERIA

The submitter is THE expert on his own initiative. His job will be to educate, inform, and convince the reviewers that his initiative makes sense, the savings can be achieved, and the benefits to the TEAM are real. The cost estimators need to be clearly identified in the initiative.

AIR-4.2.5 uses the above sheet to assess the cost merits of each AR Initiative. Submitters should be cognizant of the criteria used in the evaluation process to sell a concept. The more complete the documentation, the better idea the submitter will have of the true cost avoidances. Better documentation leads to a better chance of initiative approval since the O&MN Review Board will have a higher degree of confidence that cost avoidances (savings) are achievable.

### **Documentation of Baselines:** (10 Points)

- Clearly document the current baseline costs including how they were derived/calculated. (Identify sources used)
- Use the VAMOS AMRS, LMDSS, or NALDA data systems to construct a three-year history of expended maintenance costs that address “O” and “I” level labor costs, maintenance consumable materials and component repairs (Aviation Depot Level Repairables (AVDLRs)) appropriate to the levels affected by the Initiative.
- Identify analogous systems, either military or commercial.
- Convert costs into an average cost per flying or usage hour to establish the Initiative baseline. (Quantity and Flight/Operating hours should be documented on the Initiative Profile Baseline spreadsheet.)
- Data used will be compared to the ten-year OP-20 Flight Hour projection.
- Address all cost instruction requirements.
- Provide the basis for initiative specific baselines.

### **Cost Risk Identification:** (10 Points)

- Identify the requirement for other funding types as well as multi-year funding. Since risk levels increase due to the possibility that other or multi-year funding will be unavailable, submitters need to specifically address all assumptions regarding these factors.
- Identify other funding requirements/appropriations in the ROI and explain the assumptions made regarding their use as part of this Initiative..
- Assess any schedule assumptions that relate to timing of funding availability. Planned Start Date should be annotated on the Initiative Profile spreadsheet. Incorporate a realistic execution schedule.
- Identify other initiatives that are affected by of dependent on this Initiative.

### **Cost Time Phasing:** (10 Points)

- Demonstrate the ability to execute the proposed schedule. (Existing and usable contracts, GSA catalog items, or hardware in the supply system proposed for joint usage would lower risk.)
- Demonstrate availability of tasking/manpower when the Initiative is based on the use of government activities.

- Identify existing documentation relating to new maintenance procedures or OEM training availability which would lower risk associated with a new maintenance technique.
- Define how the investment will be made and the savings will accrue.
- Ensure the submitter’s logic, assumptions, and conclusions can be followed by non-technical reviewers without requiring a “Leap of Faith.”

**Methodology Identification:** (30 Points)

- Provide for traceability when building the methodology. The reviewer should be able to replicate the estimate given the presented data and assumptions.
- Identify estimating sources and justify why a specific methodology is most appropriate to estimating this Initiative.
- Provide a clear definition of which cost driver, i.e., AVDLR costs, simulator operations, inefficient maintenance procedures, is being addressed in the Initiative.
- Eliminate any “unknowns” that are in a proposal to lower the risk assessment..
- Adjust for inflation in the correct manner using the Inflation Indexing Tool.
- Ensure that all differences between platform baseline and the AR Initiative profile are documented.

**Cost Assumptions Documented:** (10 Points)

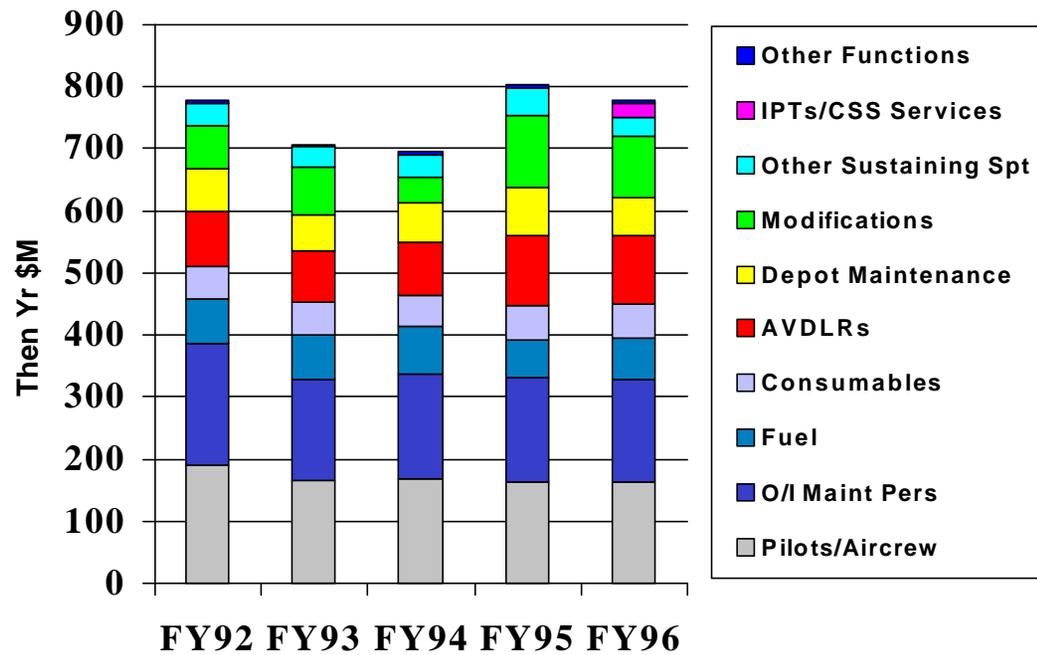
- Review assumptions made in the initiative for realism using the “prudent person” guideline. Furnish realistic cost assumptions.
- Document/justify the reasonableness and appropriateness of the major assumptions. (If the initiative proposes a study, are the savings based on assumed study outcome? What happens if the study produces different results? Is this a good foundation upon which to base investments and avoidances?)

**Risk for Achieving ROI:** (30 Points)

- Assess all of the above areas for problems in achieving the stated ROI.
- Include any missing/overlooked investment elements, errors in accounting/calculation of savings, or obvious mistakes affecting investments, savings, or both. (If an initiative calls for a Depot maintenance task to be performed at Intermediate level, are the increased Intermediate maintenance costs documented as well as the decreased Depot maintenance costs and considered when calculating overall Initiative savings?)
- Include kit installation costs in the Initiative, if an initiative is an ECP.
- The cost avoidance stream must account for out-year requirement changes which are identified in the WSPD.
- When savings are dependent upon other funded lines, ensure identification of the likelihood/source of that funding.
- Clearly state which dollars are to be funded by O&MN Board and ensure they are annotated on the Initiative Profile spreadsheet as investment costs.
- Check all arithmetical calculations and assumptions in the analysis which would limit or overstate the savings. (i.e., \$5200K is \$5.2M, not \$520K)



## FIVE YEAR VAMOSC HISTORICAL COST TREND FOR XYZ AIRCRAFT



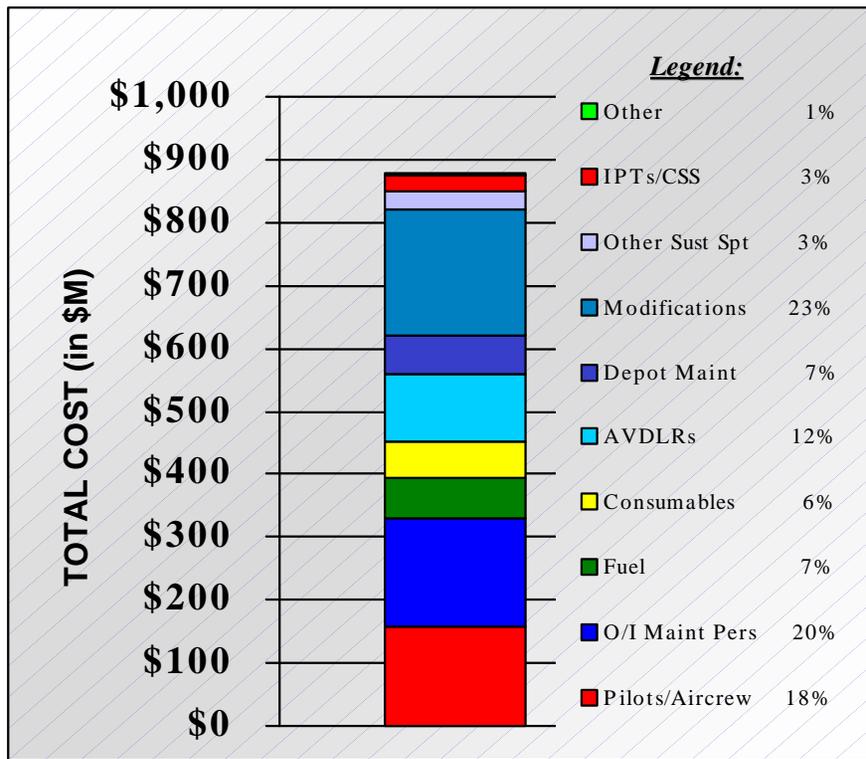
	FY 92	FY 93	FY 94	FY 95	FY 96
# AIRCRAFT	228	244	239	240	233
FLT HRS	138,967	132,691	119,856	117,542	114,261
FLT HRS / AC	610.6	543.8	501.5	489.8	512.4



# XYZ A.R. PLAN COST RELATIONSHIPS

**AFFORDABLE  
READINESS**

## FY96 Baseline



<u>A/R Strategy Defined</u>	Yes	No
Other (V)		X
IPTs/CSS (PD)		X
Other Sust Spt (V)		X
Modifications (V)		X
Depot Maintenance (V)	X	
AVDLRs (V)	X	
Consumables (V)	X	
Fuel (V)	X	
O/I Maint Personnel (V)	X	
Pilots/Aircrew (V)		X

*Elements from Affordable Readiness Plan*



**XYZ**

**AFFORDABLE  
READINESS**

## **A.R. INITIATIVES SUMMARY**

- |  |  |
|--|--|
| ● <b>RINU</b>                                      | ○ Replacement of the inertial navigation system with a newer more reliable system  |
| ● <b>Air Starter Turbine</b>                       | ○ Increase reliability of the unit through improvements in seal and bearing changes  |
| ● <b>Icebox and Microwave (Fire &amp; Ice)</b>     | ○ Replace current unreliable and uneconomical to repair units with Commercial-Off-The Shelf hardware   |
| ● <b>Air Flow Multiplier</b>                       | ○ Decrease repair costs with proposed changes to provide a speed control system, shroudless compressor design, and a new containment structure |
| ● <b>SSRGA (ASW-31)</b>                            | ○ Proposed F <sup>3</sup> replacement with Solid State component resulting in an increase of MTBD of 126 to 45,000 hours                       |
| ● <b>Isochronal Scheduled Inspection System</b>    | ○ Revising scheduled “O” level inspections to calendar based schedule should reduce unscheduled O-level manhours by up to 10%                  |
| ● <b>Commercial Phased Depot Maintenance (PDM)</b> | ○ PDM instead of SDLM and insure maintenance is performed in the most effective location and manner that still meets fleet requirements        |
| ● <b>APU</b>                                       | ○ Combination of LECP, incorporation of improved design, and RCM analysis to reduce repair/replacement costs                                   |
| ● <b>Propeller Improvements</b>                    | ○ Improve training and troubleshooting procedures/fleet practices to decrease “No Failures”, and improve seals to reduce leakage               |
| ● <b>T-56 Fuel Nozzles</b>                         | ○ Establish specialized “I” level standards and “O” & “I” troubleshooting.   |



# Program Baseline

## XYZ Projected Flight Hours/Costs without Initiatives:

### Cost Profile (Current) in 1997\$K:

	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06
Organizational Personnel	281,774.9	298,503.5	289,883.6	286,513.3	287,297.0	288,975.0	289,456.2	238,780.5	220,413.9	198,108.0
Intermediate Maintenance	34,758.6	36,971.6	35,616.2	35,319.9	35,405.9	35,597.8	35,666.3	29,420.4	27,157.0	24,409.2
Fuel	62,285.0	65,406.9	59,055.5	58,343.5	58,480.8	58,795.3	58,869.2	52,166.1	48,153.3	43,280.3
Consumables	52,383.2	64,086.2	56,574.3	56,456.8	56,339.7	56,927.7	60,285.4	41,406.0	38,220.9	34,353.1
AVDLRs	100,188.3	138,614.8	127,805.8	124,480.8	122,672.7	118,407.0	117,393.1	89,142.4	82,285.2	73,958.1
Depot Maintenance	20,866.0	17,756.4	35,576.9	27,024.1	29,675.1	32,321.0	29,679.4	34,361.2	30,120.7	27,857.0
Modifications	170,452.0	161,515.2	240,662.8	224,414.9	141,998.7	89,733.4	85,338.9	242,379.0	224,629.0	251,378.5
Sustaining Support	33,516.2	35,596.4	34,524.5	34,130.1	34,227.4	34,424.1	34,482.4	28,445.5	26,257.4	23,600.2
IPT/CSS										
Indirect Support/CLS										
Other	5,173.0	5,676.1	5,508.0	5,414.0	5,444.5	5,473.6	5,481.4	4,522.7	4,174.5	3,752.1
<b>TOTAL</b>	<b>761,397.1</b>	<b>824,127.1</b>	<b>885,207.5</b>	<b>852,097.4</b>	<b>771,541.8</b>	<b>720,654.8</b>	<b>716,652.2</b>	<b>760,623.9</b>	<b>701,411.8</b>	<b>680,696.4</b>

### Inventory Profile (Current):

	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06
Total Aircraft	232	229	226	225	222	218	208	182	168	151
Total Flight hours	106,470	113,078	109,673	108,420	108,729	109,354	109,539	90,362	83,411	74,970



# Investment/Cost Avoidance View

**AFFORDABLE  
READINESS**

**Program: XYZ**

**In \$K**

**ACTIVE**

	Prev Cum.	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	Total
<b>Direct Vendor Delivery</b>		Start Date: Apr-98		End Date: Sep-07		Break Even Date: N/A						
Investment	-	-	517.0	500.0	439.0	459.0	368.0	314.0	283.0	295.0	191.0	3,366.0
Projected Cost Avoidance	-	-	665.0	680.0	587.0	591.0	459.0	384.0	335.0	342.0	255.0	4,298.0
<b>Cumulative Net</b>	-	-	148.0	328.0	476.0	608.0	699.0	769.0	821.0	868.0	932.0	
<b>EGI</b>		Start Date: Sep-97		End Date: Sep-06		Break Even Date: FY-04						
Investment	-	6,574.0	7,845.0	3,367.0	1,316.0	-	-	-	-	-	-	19,102.0
Projected Cost Avoidance	-	-	653.0	2,257.0	3,645.0	3,536.0	3,373.0	3,318.0	3,210.0	2,611.0	2,339.0	24,942.0
<b>Cumulative Net</b>	-	(6,574.0)	(13,766.0)	(14,876.0)	(12,547.0)	(9,011.0)	(5,638.0)	(2,320.0)	890.0	3,501.0	5,840.0	
<b>Television Camera Replacement</b>		Start Date: Jan-97		End Date: Sep-07		Break Even Date: FY-03						
Investment	-	4,056.0	3,042.0	3,042.0	-	-	-	-	-	-	-	10,140.0
Projected Cost Avoidance	-	-	1,210.0	990.0	2,653.0	2,468.0	2,213.0	2,015.0	1,691.0	1,374.0	934.0	15,548.0
<b>Cumulative Net</b>	-	(4,056.0)	(5,888.0)	(7,940.0)	(5,287.0)	(2,819.0)	(606.0)	1,409.0	3,100.0	4,474.0	5,408.0	
<b>TOTALS</b>												
Investment	-	10,630.0	11,404.0	6,909.0	1,755.0	459.0	368.0	314.0	283.0	295.0	191.0	32,608.0
Projected Cost Avoidance	-	-	2,528.0	3,927.0	6,885.0	6,595.0	6,045.0	5,717.0	5,236.0	4,327.0	3,528.0	44,788.0
<b>Cumulative Net</b>	-	(10,630.0)	(19,506.0)	(22,488.0)	(17,358.0)	(11,222.0)	(5,545.0)	(142.0)	4,811.0	8,843.0	12,180.0	

**Potential**

	Prev Cum.	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	Total
<b>I-Level Test for Multi-Display Indicator</b>		Start Date: 2nd Qtr 98		End Date: FY 06		Break Even Date: 3rd Qtr 98						
Investment	-	-	34.0	-	-	-	-	-	-	-	-	34.0
Projected Cost Avoidance	-	-	227.0	399.5	349.6	317.8	255.8	195.2	127.1	104.0	-	1,976.0
<b>Cumulative Net</b>	-	-	193.0	592.5	942.1	1,259.9	1,515.7	1,710.9	1,838.0	1,942.0	1,942.0	
<b>IBM Mini-computer &amp; Software Offload</b>		Start Date: 2nd Qtr 98		End Date: FY 06		Break Even Date: 1st Qtr 00						
Investment	-	-	384.0	-	-	-	-	-	-	-	-	384.0
Projected Cost Avoidance	-	-	-	-	884.0	884.0	884.0	884.0	884.0	884.0	884.0	6,188.0
<b>Cumulative Net</b>	-	-	(384.0)	(384.0)	500.0	1,384.0	2,268.0	3,152.0	4,036.0	4,920.0	5,804.0	
<b>TOTALS</b>												
Investment	-	-	418.0	-	-	-	-	-	-	-	-	418.0
Projected Cost Avoidance	-	-	227.0	399.5	1,233.6	1,201.8	1,139.8	1,079.2	1,011.1	988.0	884.0	8,164.0
<b>Cumulative Net</b>	-	-	(191.0)	208.5	1,442.1	2,643.9	3,783.7	4,862.9	5,874.0	6,862.0	7,746.0	

**Appendix L – Engineering Change Proposals (ECPs)**

## Engineering Change Proposals (ECPs)

When programs have ECPs that they are planning to fund, an Initiative Template is required to be filled out. Again, the following shows what fields are shown on the template:

- Program
- Code of Submitter
- Title
- Summary Description
- Initiative Type: Affordable Readiness or CAIV
- Work Unit Codes Effected
- Readiness Effect
- Planned Start Date
- Break Even Date

All funding appropriations and their amounts are provided in the “Investments” field using the costs shown in the ECP - Page 4 (DD Form 1692/3, Apr 92) for the year that the ECP is funded.

The “Cost Avoidances” amounts are shown in the ECP – Page 5 (DD Form 1692/4, Apr 92). Those cost avoidances need to appear as annual savings, so that the TOC Initiative Template can be filled out properly. Attention should be paid to the fact that there would not be savings accrued until a sufficient time after the ECP had been implemented. If the ECP is implemented prior to Milestone III, then cost avoidance is possible during the Development Phase and all savings would be shown on the “Direct” line for the appropriate year(s). But cost avoidances would only exist for those years that the weapons system is still in the Development Phase, and at that point, cost avoidances would begin appearing on the Production Phase – “Flyaway” line for the appropriate year(s). If there are cost avoidances beyond the Production Phase, savings would need to be shown on the appropriate O&S cost element for the appropriate year(s). If the ECP is implemented during the Production Phase of acquisition, then any cost avoidances that are accrued during the Production Phase would be shown on the “Flyaway” line for the appropriate year(s). Then if cost avoidances are realized after the Production Phase of acquisition, then they would be indicated next to the appropriate O&S cost element for each of the appropriate years. For ECP’s implemented during the O&S Phase of acquisition, then all cost avoidances would be captured as under one or more O&S cost elements using the cost savings shown DD Form 1692/4.

**Appendix M – Frequently Asked Questions (FAQ’s)**

## TOC Frequently Asked Questions (FAQ's)

### 1. What is the difference between Total Ownership Cost and Life Cycle Cost?

*ANS:* Typical Life Cycle Cost estimates have included all costs associated with the research and development, procurement, operation, logistical support, and disposal of a weapon system. Total Ownership Cost includes all elements of life cycle cost plus the total supporting infrastructure that plans, manages, and executes that weapon system program over its full life. Total Ownership Cost also includes the cost of requirements for common support items and systems that are incurred because of introduction of that weapon system. Memo of 13 Nov 1998 from ASN RD&A, Subj: Definition of Total Ownership Cost (TOC), Life Cycle Cost (LCC), and the Responsibilities of Program Managers provides the following definitions which are official within DoD for both DoD TOC and Defense Systems (Weapons Systems) TOC.

**DoD TOC:** “Comprised of costs to research, develop, acquire, own, operate, and dispose of weapon and support systems, other equipment and real property, the costs to recruit, train, retain, separate and otherwise support military and civilian personnel, and all other costs of business operations of the DoD.”

**Defense Systems TOC:** “Defined as Life Cycle Cost (LCC). LCC (per DoD 5000.4M) includes not only acquisition program direct costs, but also the indirect costs attributable to the acquisition program (i.e. costs that would not occur if the program did not exist). For example, indirect costs would include the infrastructure that plans, manages, and executes a program over its full life and common support items and systems.”

**Program Manager TOC Role:** “The responsibility of program managers in support of reducing DoD TOC is the continuous reduction of LCC for their systems.”

### 2. What is meant by linked-indirect cost?

*ANS:* Linked-indirect costs refer to those costs generated as a result of introducing and supporting a weapon system in the fleet, but which cannot be directly associated with one specific program. Examples of linked-indirect cost include non-weapon system specific operator and maintainer training and SYSCOMs contracts office. Non-linked indirect costs, not included under Total Ownership Cost, include things like the Navy Band and shore based hospitals.

### 3. How do CAIV and Affordable Readiness relate to TOC?

*ANS:* Cost An an Independent Variable (CAIV) is a means for managing costs - - costs are challenged rather than accepted as a given. All programs have already developed CAIV plans which were to define initiatives for reducing total LCC (TOC). Affordable Readiness (AR) is an extension of CAIV. AR is NAVAIR's approach for implementing CAIV on in-service programs. Both CAIV and AR are mechanisms to positively impact Total Ownership Cost.

#### **4. What is included in the TOC element structure?**

*ANS:* The TOC element structures include cost elements for each phase of the program: research & development, production, operating & support, and demilitarization & disposal. Expanded TOC element structures for Aircraft, Electronics, and Missiles are identified on the TOC web site under the "Cost Element Structure" button and Appendix D of this Guidebook.

#### **5. How are the systems and subsystem TOC plans rolled up into the platform TOC plans? If they are linked, then how could we have completed some of the platform plans, when there are numerous subsystems that haven't begun to develop theirs?**

*ANS:* The overall OSD emphasis is upon reducing costs at the Weapons System Level. The Weapon System should take credit for all TOC initiatives that reduce the Acquisition, projected Operations and support or In-Service Operations and Support Costs of their platform. Those Weapons Systems cost reductions that are realized through planned implementation of a system or subsystem level TOC reduction (for example improved Radar) should be annotated to reflect that the cost savings are result of a "system or subsystem's TOC plan." There needs to be close coordination and agreement between subsystem level TOC plans with the impacted weapons systems – especially when the impact of the subsystem level TOC initiative impacts the weapons systems acquisition or flight hour program funding. In the case where platform plans are required before subsystems there again needs to be coordination to establish reasonable expectations so that the weapon system will have realistic objectives. TOC reduction plans are intended to be living documents which can be adjusted over time. However, goals and thresholds should be established initially that establish reasonable expectations.

#### **6. Is the requirement to develop TOC plans for all ACAT programs, or all programs currently fielded?**

*ANS:* ASN(RDA) direction has a focus for all programs whereas the AIR-1.0 memo dated 31 July 1998 only specifically addresses those programs currently in the acquisition process. Since the stated DoD requirement is to force changes that accrue large Operations and Support reductions for fielded systems it appears that all significant fielded systems should have a cost reduction plan. Note that all NAVAIR programs that are in-service are supposed to have Affordable Readiness Programs in place. Since the Affordable Readiness program is the basis for an in-service program's TOC reduction plan it appears that all NAVAIR programs should have a plan in place.

#### **7. Do the reductions to the baseline TOC cost have to be specific, or can an IPT lead simply place an objective (like 5% reduction) to the baseline?**

*ANS:* We believe the reductions need to be specific, based on the cumulative net cost avoidance/savings associated with a program's CAIV or Affordable Readiness initiatives (per encl (1) of AIR-1.0's policy memo dated 31 Jul 98 on implementation of TOC baselines). The

goals should be achievable based on executable initiatives. The exception would be an early development program like JSF that needs to work the cost and operational trades process. For an early development program percentage reductions would probably be more appropriate.

**8. Who is going to contact the PMAs/IPTs which we are not currently supporting? An example would be the P-3 SRP - has EVM support, but no estimating.**

*ANS:* We believe the PMAs should define the initiative to ensure that they have adequate TOC cost estimating support, whether from 4.2 or elsewhere. The Cost Department has assigned specific individuals to support cost efforts in the following PEO's: AIR-4.2 301 342-0242. Available by request to NAVAIR personnel

**9. A majority of the additional costs we are capturing with the TOC effort are not controlled by the Program Manager, and the Program Manager is being asked to sign up to goals and thresholds including these costs. Most of the initiatives we are capturing will aim to reduce either acquisition or O&S costs that would have been captured under our standard O&S estimate. In a few weeks, we should be able to quantify for you the percent of costs for the V-22 that the program manager can actually affect.**

*ANS:* Most O&S costs are not "Directly" controlled by the Program Manager. Nevertheless, each PM has the responsibility to attempt to control costs through a combination of smart investments, changes in maintenance policy, working with N-8 and fleet sponsors, etc., to find ways to reduce Total Ownership Costs.

**10. When we are allocating costs across platforms, how do we ensure that we do not over or under allocate? We have heard that some platforms may allocate based on flight hours, while others may use number of aircraft. An example of what we are talking about would be allocating a security force at a base between multiple platforms.**

*ANS:* For different types of costs different allocation parameters may be required. The AIR-4.2.5 Total Ownership Cost estimates have examples of allocations done for training costs, land-based IMA and other areas. Each used an allocation that flowed out of the available usage data. It's really up to the PMA to decide how they want it.

**11. Are TOC plans and estimates required for the Air Force or Army portion of Navy-lead joint program?**

*ANS:* The current guidance that all programs participate is unique to the DoN. In the short term Army and Air Force are going with pilot programs, so there is no requirement currently to provide TOC plans.

**12. On programs where the Air Force- or Army-leads the joint service program, are TOC plans and estimates required for the Navy portion for the other service portion?**

*ANS:* In a seminar , attended by PEO(T)ACQ2, on 19-20 Oct, she spoke to an ASN(RD&A) representative who indicated that there is no requirement to provide APBAs/TOC Reduction Plans on Army- or USAF-lead programs.

**13. Does the definition of what is included in a development or production Acquisition Program Baseline Agreement (APBA), with a Navy decision authority, provide guidance on what is included in the TOC estimate, or on whether a TOC plan and estimate are required?**

*ANS:* The 5000 series directives do not mention TOC in connection with APBs. The ASN(RD&A) memo of 5 May 1998 and AIR-1.0 memo of 31 July 1998 contained on the NAVAIR TOC web site (<http://www.navair.mil/toc/>) provide the guidance as to what should be included. There are also sample cost structures for aircraft, electronics, and weapons systems included on the web site.

**14. On many avionics programs, the equipment initially developed and procured by PMA-272 or PMA-209 or PMA-213, is GFE electronics on the aircraft. How much of the TOC cost (RDT&E, APN and O&MN) for these programs should be included in the aircraft TOC?**

*ANS:* See the answer to question 5. The costs need to be captured at the aircraft weapons system level because that is the level at which fleet funding is provided for component repair, consumable materials and labor composition, i.e., squadron manning, which are the primary areas that could show O&S cost savings for subsystem improvements. It is also important that the avionics system ensure that their savings are being captured against the end item systems and should not be double counted.

**15. We are unclear on what the TOC baseline should be: Is it the Presidential Budget FY99, SAR Dec 98, Annual year buy, Multiyear buy, with or without planned future avionics modifications (Mission Computer, Cooperative Engagement Capability, SATCOM, Vapor Cycle, New displays)?**

*ANS:* We recommend that programs use the TOC baseline basis that makes sense for their specific weapons system.

**16. What year should the baseline start: FY99 or should we go back to the point we got our last milestone approved?**

*ANS:* See answer 15. In addition, the templates are set up to start with FY99, and then "Prior" would include FY98 costs.

**17. When should the baseline end? The TOC charts show a "To Complete" column. Should "To Complete" reflect a true phase out of the E-2C or are we selecting a stopping year?**

*ANS:* “To Complete” should capture the remaining life cycle costs (including disposal) of the program beyond the ten years shown.

**18. Is there an approval process to get TOC plans signed off by AIR-4.2? If there is a process, could you please explain who and how long so we can plan this into our schedule. Is there a formal approval process once the TOC plans are submitted to the PMA? Who needs a copy by 31 Dec 98 and is there a lead time to get this through the proper channels to be completed on 31 Dec?**

*ANS:* The Cost Department will not “sign off” on the TOC plans. However, we will work with the PMAs as they put their plans together. As with all estimates, AIR-4.2 has the responsibility to raise any issues that we may have about the validity of the data used and the methodology used to develop the estimate /ROI. We anticipate the PEOs will look to us to tell them if the analysis is sound.

**19. How are Demilitarization and Disposal costs estimated? Is there a standard estimating method used by 4.2.5. to estimate these costs?**

*ANS:* At this time AIR-4.2.5 does not have a standard model or process that is being used to estimate Demilitarization and Disposal costs. Programs should come up with the best approach available to create costs for this based on their anticipated process for removing their weapons system from the active inventory. As an example many current aircraft are preserved and maintained in that “mothballed” condition in the desert. For the future Tecolote is working on an ECHO (Environmental Consequences of Hazardous Operations) model under an ongoing SBIR initiative. As this model is completed it may provide the appropriate estimate and data tools to generate meaningful estimates in these categories. Points of contact within Tecolote are Bill Jago or Bill Custer.

**20. How many years does the TOC Plan need to be extended? I have heard 10 years and 20 years. I have also heard that it needs to be extended through the lifetime of the system.**

*ANS:* Individual Affordable readiness initiatives were developed using a 10-year baseline and period of performance. However, TOC plans as specified in the AIR-1.0 memo of 31 Jul 98 and attached templates are required to provide costs for the entire Life Cycle.

**21. According to the TOC Implementation Memo, TOC is nothing more than a standard LCC with a few additional elements added. These elements are Common Support Equipment, EOB Personnel, and demilitarization and disposal costs. If this is the case, how are these elements incorporated into the TOC/O&S Cost Estimating Structure?**

*ANS:* The NAVAIR TOC web site (<http://www.navair.mil/toc/>) provides recommended comprehensive Total Ownership Cost Structures. These structures should be used as guidelines for formulation of individual program Total Ownership Cost estimates. PMA’s need to populate the data that is available.

**22. Given the existing TOC templates what type of dollar base should be used for developing costs of initiatives and reporting prior year, current year and out year TOC LCC costs?**

*ANS:* All costs shall be provided in Constant FY99 dollars.

### **23. What are the recommended data sets to be used for identification, estimating and tracking of Operations and Support (O&S) Costs?**

**ANS:** The Navy Visibility and Management of Operating and Support (VAMOS) cost reporting system is the primary database for identification and tracking over time of Aviation platform and subsystem Operations and Support Costs. This system is maintained by the Naval Center for Cost Analysis (NCCA). Detailed information is available on the NCCA website at (<http://www.ncca.navy.mil/>). AIR-4.2.5 also provides detailed information as noted below available for many aircraft programs. For weapons systems and other non-aircraft systems programs/analysts will have to seek other sources to identify their operations and support costs.

**Additional information on data sources is available in the 21 T/M/S Total Ownership cost estimates published by AIR-4.2.5. Programs with TOC estimates include: C-2C, AV-8B, CH-46E, E-2C, EA-6B, F/A-18A, F/A-18C, F/A-18D, F-14A, F-14B, F-14D, KC-130F, MH-53E, CH-53E, P-3C, S-3B, SH-60B, SH-60F, HH-60H, UH-1N and AH-1W.**

The paragraphs below describe the two major components of VAMOS.

#### **AIRCRAFT MAINTENANCE SUBSYSTEM REPORT (AMSR)**

Displays detailed aircraft maintenance cost and non-cost data for all Navy and Marine Corps aircraft T/M/S at O-, I-, and D-levels of maintenance. Most data are relevant only to aircraft repairable components. Summary cost and non-cost data are provided for aircraft and engines. A data element structure of approximately 374 elements in eight sections has been established. A complete report for each Type/Model/Series and a complete summary report for each Type/Model is published annually for each fiscal year. Reports are published for 2-, 5-, and 7-digit Work Unit Codes (WUCs). **AIR-4.2.5 publishes the last three years of VAMOS maintenance history data for the 21 major T/M/S having annual O&S estimates at the 2-digit WUC level. We also are completing development of a trend analysis/forecasting tool that has all available data for the 21 T/M/S by month for all cost elements and many other maintenance related indicators.**

#### **AIRCRAFT TYPE/MODEL/SERIES REPORT (ATMSR)**

Displays total operating and support costs for all aircraft T/M/S. The report includes aircraft inventory and consumption data. The data element structure contains 72 data elements comprising the main commodities contributing to operating and support costs. The report has a hierarchical display structure focusing first on aircraft T/M/S, then on major claimant, and finally on maintenance level (O,I, and D). **AIR-4.2.5 publishes in their program estimates and can provide to all active T/M/S aircraft their six-year cost history (FY92-FY97) in Affordable Readiness Formats. This report includes charting of key elements of cost over time.**

**Appendix N – ACAT Programs and their Cost Team Leaders (CTL's)**

Project\Subproject Milestone Report  
 Naval Aviation Acquisition Category Programs  
 Dates Below are in Fiscal Years

10/19/98

Program Manager	Program Element	Project\ Subproject	Project Title	CTL	ACAT	Milestones (Yr/M or Qtr)				
						0	I	II	LRIP	III
AIR-4.0T	0603216N	W0584-01	ADV INTEGRATED LIFE SUPPORT SYSTEM		NON	n/a	n/a	n/a	n/a	n/a
AIR-4.1	0205633N	W1041	A/C EQUIP R&M IMPR PROG AERMIP		NON	n/a	n/a	n/a	n/a	n/a
AIR-4.1	0205633N	W1041FTG	NAV FLT TEST GENERAL (FTG) PRG		NON	n/a	n/a	n/a	n/a	n/a
AIR-4.1	0603262N	W0592	A/C & ORDNANCE SAFETY		NON	n/a	n/a	n/a	n/a	n/a
AIR-4.1.8	0603262N	W0591	A/C SURV & VULN		NON	n/a	n/a	n/a	n/a	n/a
AIR-4.4	0205633N	W1355	A/C ENGINES COMP IMP PROG		NON	n/a	n/a	n/a	n/a	n/a
AIR-4.4	0603210N	W2014	INTEG HP TURBINE TECH (IHPTET)		NON	n/a	n/a	n/a	n/a	n/a
AIR-4.6T	0603216N	W0584-34	AGILE LASER EYE PROTECTION		IVT	n/a	93/1Q	n/a	n/a	n/a
AIR-4.6T	0603216N	W0584-05	ADVANCED TECHNOLOGY CREW STATION		NON	n/a	n/a	n/a	n/a	n/a
AIR-4.6T	0603216N	W0584-07	ADV HEAD PROTECTION TECH BASELINE		NON	n/a	n/a	n/a	n/a	n/a
PEO(CU)	0204229N	A0545-10	R&D ENG SUPPORT		NON	n/a	n/a	n/a	n/a	n/a
PEO(CU)	0204229N	A0545-23	SSN VLS INTEGRATION		NON	n/a	n/a	n/a	n/a	n/a
PEO(CU)	0204229N	A0545-24	WCS UPGRADES		NON	n/a	n/a	n/a	n/a	n/a
PMA201	0604312N	A2242	JT AIR-SURF STANDOFF MSL (USAF LEAD)		ID	95/4Q	96/3Q	99/1Q	00/2Q	01/3Q
PMA201	0604618N	E2137	JT DIR ATTACK MUNIT (JDAM) (USAF LD)		ID	92/3Q	94/1Q	95/4Q	97/04	99/4Q
PMA201	004727N	E2068	JOINT STANDOFF WEAPON(JSOW)BASELINE	Harris	ID	n/a	89/3Q	92/3Q	97/01	99/1Q
PMA201	0604727N	E2068-01	JOINT STANDOFF WEAPON (JSOW)UNITARY	Harris	ID	n/a	n/a	95/3Q	01/3Q	03/2Q
PMA201	0604727N	E2068-02	JOINT STANDOFF WEAPON (JSOW)BLU-108	Harris	ID	n/a	n/a	95/3Q	99/1Q	02/4Q
PMA202	0604264N	W0606-12	COMMON EJECTION SEAT (NACES)		III	n/a	n/a	85/3Q	90/1Q	91/02

- LRIP Program Review, used if LRIP decision not made at Milestone II

PMA202	GGGGGGGN	WGGGG	HELMET MOUNTED CUEING SYS (AF LEAD)	III	n/a	96/1Q	97/1Q	n/a	00/2Q
PMA202	0604264N	W0606-21	HELO HELMET REPLACEMENT PROG.	IVT	n/a	n/a	n/a	n/a	93/4Q
PMA202	0604264N	W0606-XX	NAVY COMBAT EDGE (FORMERLY ATLSS)	IVT	n/a	n/a	n/a	n/a	98/01
PMA202	0604264N	W0606	JOINT AIRCREW LASER EYE PROT VISOR	IVM	n/a	n/a	96/3Q	n/a	00/1Q
PMA205	0804743N	47C2	COMPUTER-BASED TRAINING	IVM	n/a	n/a	n/a	n/a	97/03
PMA207	2204696N	056200	C-9B/DC-9 AVIONICS UPGRADE	IVM	n/a	n/a	n/a	n/a	97/06
PMA207	84742N		T-39N UNDERGRADUATE FLIGHT OFFICR TS	IVM	n/a	n/a	n/a	n/a	97/05
PMA207	AAAAAAN	WAAAA	KC-130 REPLACEMNT AIRCRAFT (KC-130J) <b>Moler</b>	IVM	n/a	n/a	n/a	n/a	97/07
PMA207	PPPPPPPN	WPPPP	C-9 REPLACEMENT - C-40A	IVM	n/a	n/a	n/a	n/a	97/08
PMA208	HHHHHHHN	AHHHH	IMPROVED TACTICAL AIR LAUNCHED DECOY	III	n/a	n/a	n/a	n/a	94/12
PMA208	0604258N	A0609-02	QF-4S FULL SCALE A/C TRGT SYS	IVM	n/a	n/a	89/2Q	n/a	96/09
PMA208	0604258N	A0609-03	BQM-74E MOBILE SEA RANGE AERIAL TGT	IVM	n/a	n/a	88/2Q	n/a	91/04
PMA208	FFFFFFFFN	AFFFFF	VANDAL EXTENDED EXTENDED RANGE (EER)	IVM	93/1Q	93/3Q	93/3Q	n/a	94/11
PMA208	KKKKKKN	AKKKK	AQM-37C TARGET	IVM	n/a	n/a	n/a	n/a	95/08
PMA209	0604215N	W0572	ADVANCED MISSION COMPUTER & DISPLAY <b>Davis</b>	II	n/a	98/3Q	98/3Q	01/2Q	04/1Q
PMA209	0204163N	W0661-04	COMBO RADIO (AN/ARC-210) - <b>S. Davis</b>	III	n/a	n/a	85/3Q	92/06	94/04
PMA209	0604215N	W0572-XX	TACTICAL A/C MOVING MAP CAPABILITY- <b>Davis</b>	III	n/a	96/12	96/12	n/a	00/4Q
PMA209	0604203N	W0572-061	GPWS/CATEGORY I (PATROL/TRANSPORT)- <b>Davis</b>	IVT	n/a	n/a	89/2Q	n/a	96/09
PMA209	0604203N	W0572-063	GPWS/CATEGORY III (HELOS) - <b>S. Davis</b>	IVT	n/a	n/a	93/07	n/a	97/06
PMA209	0604203N	W1630-01	CAINS II (AN/ASN-139) - <b>S. Davis</b>	IVT	n/a	n/a	84/4Q	90/03	91/07
PMA209	0604215N	W0572-15	LOW PROBABILITY INTERCEPT ALTIMETER <b>Davis</b>	IVT	93/2Q	96/08	96/08	99/3Q	00/3Q
PMA209	0604574N	W0845-01	AN/AYK-14 (VPM) - <b>S. Davis</b>	IVM	n/a	n/a	86/2Q	91/3Q	93/4Q
PMA209	COSIP	43-94	CRASH SURVIVABLE FLIGHT INCIDENT RECD <b>Davis</b>	IVM	n/a	n/a	n/a	n/a	97/07
PMA209	0204161N	057700	TRAFFIC ALERT & COLLISION AVOIDANCE <b>Davis</b>	TBD	n/a	n/a	n/a	n/a	00/2Q

PMA213	0603860F	TTTTT	JT PRECISION APPR & LANDNG (AF LEAD)	ID	96/05	02/2Q	02/2Q	n/a	n/a
PMA213	0604504N	W1657	NAS MODERNIZATION (USAF LEAD)	IC	90/11	92/11	95/07	n/a	00/2Q
PMA213	0604211N	W0676-02	SARTIS AN/UPX-34(V)	III	n/a	90/2Q	90/2Q	n/a	97/12
PMA213	0604211N	W0676-03	AN/SLQ-20B UPGRADE	III	n/a	93/09	93/09	n/a	97/02
PMA213	0604504N	W0993	CARRIER ATC (AN/SPN-46(V))	III	n/a	n/a	80/4Q	85/4Q	90/3Q
PMA213	0204228N	MT031	DIGITAL INTERROGATOR	IVT	n/a	n/a	n/a	n/a	98/3Q
PMA213	MMMMMMN	WMMMM	REMOTE LANDNG SITE TOWER/MATCAL MOD	IVT	n/a	n/a	n/a	n/a	99/1Q
PMA213	UUUUUUUN	WUUUU	AN/UPM-155	IVM	n/a	n/a	n/a	n/a	86/4Q
PMA225	0204233N	W0534	UH-3H EXECUTIVE TRANSPORT UPGRADE	IVM	n/a	n/a	n/a	n/a	95/07
PMA226	ECP	H-46-59	H-46 COMMUNICATION NAVIGAT CONTR SYS	IVT	n/a	n/a	n/a	94/2Q	96/08
PMA231	0204152N	E0463	E-2C REPRODUCTION	- R. Scott IC	n/a	n/a	n/a	n/a	94/09
PMA231	0204152N	E0463-06	E-2C MISSION COMPUTER UPGRADE	- R. Scott II	n/a	n/a	94/09	97/07	00/3Q
PMA231	0204696N	OSIP24-94	C-2A(R) SERVICE LIFE EXTENSION PROG	Scott IVT	n/a	94/01	n/a	03/4Q	04/1Q
PMA231	0604252N	W1731	T-56-A-427 TURBOPROP ENGINE (E-2C)	Scott IVT	n/a	n/a	84/2Q	93/06	94/09
PMA231	0204152N	E0463-07	E-2C FULL SATELLITE COMMUNICATIONS	Scott III	n/a	n/a	n/a	n/a	n/a
PMA233	0604231N	E2213	TACT AUTOMATED MISSION PLANNING SYS	IVT	n/a	n/a	n/a	n/a	86/3Q
PMA234	ZZZZZZZN	EZZZZ	EA-6B ICAP III	- K. Kehrer II	n/a	n/a	98/03	02/4Q	03/4Q
PMA234	0604270N	E0556	EA-6B ALQ-99 LOW BAND TRANSMITTER-	Kehrer III	n/a	n/a	96/09	01/3Q	02/1Q
PMA234	OSIP	19-79	EA-6B ALQ-99 BAND 9/10	- K. Kehrer III	n/a	n/a	n/a	n/a	97/11
PMA234	0204154N	E051100	EA-6B MULTI-MISSION ADV TAC TERMIDM	Kehrer IVT	n/a	n/a	n/a	98/04	99/2Q
PMA234	0206143N	E051100	EA-6B USQ-113 RADIO CM SET	- K. Kehrer IVT	n/a	n/a	n/a	98/04	99/2Q
PMA234	0604270N	E0556-17	EA-6B UNIVERSAL EXCITER UPGRADE	K. Kehrer IVT	n/a	n/a	n/a	n/a	96/03
PMA234	OSIP	42-93	EA-6B BLOCK 89A	- K. Kehrer IVT	n/a	n/a	95/3Q	98/03	99/4Q
PMA241	0204144N	EEEE	F-14 PRECISION STRIKE	- C. Biver III	n/a	n/a	n/a	n/a	96/1Q

PMA241	0205667N	E1408	F-14 UPGRADE	- C. Biver III	n/a	n/a	n/a	n/a	n/a
PMA241	0204144N		F-14 DIGITAL FLIGHT CONTROL SYSTEM-	Biver IVT	n/a	n/a	n/a	97/12	98/03
PMA242	0205601N	W1780-01	HARM INTERNATIONAL UPGRADE (BLOCK VI)	III	n/a	n/a	98/07	n/a	03/3Q
PMA242	LLLLLLLLN	ELLLL	AGM-114K HELLFIRE II (ARMY LEAD)	III	n/a	n/a	n/a	n/a	n/a
PMA242	JJJJJJJN	EJJJJ	TOW-2A(AIR) BGM-71E-5B (USAF LEAD)	IVM	n/a	n/a	n/a	n/a	n/a
PMA242	0603217N	W2185	AARGM	NON	n/a	n/a	n/a	n/a	n/a
PMA248	0204571N	W1998	JOINT TACTICAL COMBAT TRAINING SYS	II	n/a	92/10	95/03	n/a	n/a
PMA248	0204571N	W0431	TACTICAL AIRCREW COMBAT TRAINING SYS	IVT	n/a	n/a	n/a	85/2Q	90/11
PMA248	0204571N	SC012	EC SHALLOW WATR UNDRSEA WARFRE TR RN	IVM	94/04	96/06	96/06	n/a	97/09
PMA248	0204571N	W0604	HAWAIIAN ISLNDS SHALLOW WATER TR RAN	IVM	n/a	96/06	96/06	n/a	97/05
PMA248	0604208N	W0604	PMRF SHALLOW WATER RANGE	IVM	94/09	96/06	96/06	n/a	96/06
PMA248	0604208N	W0604-22	WEAPONS IMPACT SCORING SET (V4)	IVM	n/a	n/a	89/4Q	n/a	94/4Q
PMA251	0603512N	W1723-18	VIRTUAL IMAGING SYS/APPROACH & LANDG	IVT	n/a	97/06	00/1Q	n/a	03/1Q
PMA251	0604512N	W2232-01B	IMP FRESNEL LENS OPTICAL LANDING SYS	IVT	n/a	n/a	95/12	n/a	99/1Q
PMA251	0604512N	W2232-05	ADMACS/ISIS - CV/CVN VARIANT	IVT	n/a	n/a	97/09	n/a	99/2Q
PMA251	0604512N	W2232-06	ADMACS/ISIS - LHA/LHD VARIANT	IVT	n/a	n/a	99/2Q	n/a	02/1Q
PMA251	0603262N	W1819-01	A/S32P-25 SHIPBOARD FIRE TRUCK	IVM	n/a	n/a	93/05	n/a	97/04
PMA251	0603512N	W1723-11	VSTOL A/C OPTICAL LANDING SYS	IVM	n/a	n/a	88/3Q	n/a	94/03
PMA251	0603512N	W2269	M31 USMC EXPEDITIONARY ARRESTING GEAR	IVM	n/a	98/05	98/05	99/2Q	02/1Q
PMA251	0604512N	W2232	LONG RANGE LINE-UP SYSTEM	IVM	n/a	n/a	96/09	98/4Q	99/1Q
PMA251	TTTTTTTN	WTTTT	MORIAH	TBD	n/a	99/1Q	99/1Q	n/a	00/2Q
PMA257	0604214N	H0652-01	AV-8B REMANUFACTURE	- B. Baker IC	n/a	n/a	n/a	n/a	94/2Q
PMA257	0206110M	21-92	AV-8B AUTOMATIC TARGET HAND-OFF SYS	Baker IVT	n/a	n/a	n/a	n/a	n/a
PMA258	0604603N	A2183	SLAM EXTENDED RANGE	- B. Schaefer II	n/a	n/a	95/02	97/03	99/2Q

PMA258	0603306N	A1958-01	AN/AWW-13 ADVANCED DATA LINK POD	<b>Schaefer</b>	IVT	n/a	n/a	n/a	88/1Q	92/3Q
PMA259	0207161N	E0457	SIDEWINDER AIM-9X	- <b>S. Scott</b>	ID	n/a	95/1Q	96/12	00/2Q	02/2Q
PMA260	0205633N	W0852	CONSLDT AUTOMTD SPT SYS (E-0 SUBSYS)	<b>Fazio</b>	II	n/a	82/1Q	85/2Q	97/07	99/1Q
PMA260	QQQQQQQN	WQQQQ	JT SERV ELECT COMBAT SYS TESTR (AF)	<b>Fazio</b>	III	n/a	n/a	95/10	n/a	00/4Q
PMA260	0204161N	47C2	VAST TO CASS OFFLOAD)	- <b>T. Fazio</b>	IVM	n/a	n/a	n/a	n/a	96/12
PMA260	0204161N	47C2(3)	HIGH POWER OFFLOAD TO CASS)	- <b>T. Fazio</b>	IVM	n/a	n/a	94/3Q	n/a	99/4Q
PMA260	0204161N	47C2(4)	JET AIR START UNIT	- <b>T. Fazio</b>	IVM	n/a	92/2Q	95/3Q	n/a	99/1Q
PMA260	0204161N	47C2-2	ELECTRO-OPTIC TS OTPS OFLOAD TO CASS	<b>Fazio</b>	IVM	n/a	n/a	97/06	n/a	99/4Q
PMA263	0305154N	W7000	MEDIUM ALTITUDE ENDURANCE/PIONEER	- <b>R. Kohn</b>	II	n/a	n/a	n/a	n/a	n/a
PMA264	0603254N	H1292	EXTENDED ECHO RANGING (EER) SYSTEM		III	n/a	n/a	n/a	n/a	95/03
PMA264	0604261N	H0480-04	SWALAS (FORMERLY AAS)		III	94/2Q	96/09	01/4Q	n/a	06/4Q
PMA264	0604261N	H2000-02	AIR DEPLOYABLE ACTIVE RECEIVER (ADAR)		III	n/a	n/a	92/3Q	n/a	99/1Q
PMA264	0604261N	H0480-01	GENERIC ACOUSTIC STIMULATION SYS		IVM	n/a	n/a	97/02	n/a	02/3Q
PMA264	0603708N	W0490	PROJECT BEARTRAP		NON	n/a	n/a	n/a	n/a	n/a
PMA265	0204136N	E1662	F/A-18E/F	- <b>J. Moore</b>	IC	n/a	n/a	92/3Q	98/04	00/2Q
PMA265	CCCCCCCN	ECCCC	F/A-18C/D	- <b>J. Moore</b>	IC	n/a	n/a	76/1Q	80/3Q	81/3Q
PMA265	0204136N	E1662-01	F/A-18 APG-73 RADAR UPGRADE PHASE I	<b>Moore</b>	II	n/a	n/a	94/4Q	95/2Q	96/08
PMA265	0204136N	E1662-02	F/A-18 ADVANCED TARGETING FLIR SYS-	<b>Moore</b>	II	n/a	n/a	97/11	00/3Q	02/3Q
PMA265	0603261N	E0534	F/A-18 TACTICAL RECONNAISSANCE	- <b>J. Moore</b>	II	n/a	n/a	n/a	97/12	99/2Q
PMA268	0604314N	E0981	AMRAAM (USAF LEAD)		IC	n/a	79/1Q	82/4Q	87/3Q	91/3Q
PMA271	056400	N/A	E-6 AIRBORNE COMMAND POST (ABNCP)	<b>Rawlins</b>	III	95/01	95/01	95/01	n/a	95/01
PMA271	0101315N	056400	E-6 MULTIFUNCTION DISPLAY SYS	- <b>Rawlins</b>	IVT	n/a	n/a	n/a	n/a	99/1Q
PMA271	0101402N	H0793-18	E-6A ORBIT IMPROVEMENT SYS	- <b>S. Rawlins</b>	IVM	n/a	n/a	94/2Q	n/a	95/10
PMA271	101402N	H0793	E-6B MOD MINI REC TERMNL (AF)	- <b>Rawlins</b>	IVM	96/1Q	96/1Q	96/3Q	n/a	00/2Q

PMA272	RRRRRRRN	ERRRR	COMMON MISSILE WARNNG SYS (USA) - <b>D. Penner</b>	IC	n/a	n/a	95/4Q	n/a	01/4Q
PMA272	0204161N		ALR-67(V)2 RADAR WARNING RECEIVER- <b>Penner</b>	II	n/a	n/a	82/1Q	n/a	93/2Q
PMA272	0604270N	E2175	INT DEF ECM: ALQ-214 RADIO FREQ CM <b>Penner</b>	II	n/a	n/a	95/10	01/2Q	02/4Q
PMA272	0604270N	E2175-04	ALR-67(V)3 ADV SPECIAL RECEIVER) - <b>Penner</b>	II	n/a	n/a	87/2Q	98/04	99/3Q
PMA272	0604270N	E2175-05	ALE-50 CM DECOY DISP SET,AAED & MPL <b>Penner</b>	II	n/a	n/a	87/2Q	n/a	96/11
PMA272	0604270N	E2175-02	AVR-2 LASER WARNING DEV (USA) - <b>D. Penner</b>	III	n/a	n/a	n/a	n/a	90/1Q
PMA272	0604270N	E2175-03	ADV STRATEGIC & TAC IR EXPEND (AF) <b>Penner</b>	III	n/a	n/a	95/3Q	n/a	01/2Q
PMA272	0604270N	E2175-08	AN/ALQ-144 INFRARED CM (USA LEAD)- <b>Penner</b>	III	n/a	n/a	n/a	n/a	87/2Q
PMA272	0604270N	E2175-09	AAR-47 MISSILE WARNING SYSTEM - <b>D. Penner</b>	III	n/a	75/4Q	82/4Q	n/a	87/3Q
PMA272	0604270N	E2175-17	APR-39A(V)2 RADAR WARN REC(USA) <b>D. Penner</b>	III	n/a	n/a	88/3Q	n/a	96/3Q
PMA272	0604270N	W0638-18	ALQ-164 TACAIR ECM POD) - <b>D. Penner</b>	III	n/a	n/a	n/a	n/a	90/4Q
PMA272	0604270N	W2175-06	GENERIC EXPENDABLE (GEN-X) DECOY)- <b>Penner</b>	III	n/a	83/3Q	89/4Q	n/a	92/3Q
PMA272	0604270N	W2175-07	ALE-47 CMDS (USAF LEAD) - <b>D. Penner</b>	III	80/3Q	83/4Q	88/4Q	92/4Q	93/08
PMA272	0604270N	W2175-23	BOL CHAFF DISPENSER (LAU-138) - <b>D. Penner</b>	III	n/a	n/a	n/a	n/a	93/1Q
PMA272	0603270N	E2194	ELEC WARFARE ADVANCED TECHNOLOGY - <b>Penner</b>	NON	n/a	n/a	n/a	n/a	n/a
PMA272	0604255N	W0602	ELEC WARFARE ENVIR SIM (ECHO) - <b>D. Penner</b>	NON	n/a	n/a	n/a	n/a	n/a
PMA272	0604255N	W0672	EFFECTVNESS OF NAVY EW SYSTMS(ENEW) <b>Penner</b>	NON	n/a	n/a	n/a	n/a	n/a
PMA273	0603208N	H1142	T45TS - <b>O. Gutierrez</b>	IC	79/3Q	84/4Q	84/4Q	92/3Q	95/2Q
PMA273	0603208N	H1150	JOINT PRIMARY A/C TRAINING SYS (T6A) IC		93/2Q	93/2Q	95/4Q	95/4Q	99/4Q
PMA275	0604262N	H1425	V-22A OSPREY - <b>C. Mushrush</b>	IC	82/1Q	83/1Q	86/3Q	97/04	01/1Q
PMA276	0603266N	A2279	USMC H-1 UPGRADES - <b>A. Ryan</b>	ID	n/a	n/a	96/10	02/2Q	04/2Q
PMA276	0604213N	H1378	AH-1W NIGHT TARGETING SYSTEM - <b>A. Ryan</b>	IVT	n/a	n/a	88/4Q	92/07	94/02
PMA276	0206120M	053200	UH/HH-1N MAIN DRIVE SHAFT REPLACEMNT <b>Ryan</b>	IVM	n/a	93/3Q	93/3Q	n/a	94/1Q
PMA280	DDDDDDDN	ADDDD	TOMAHAWK BLOCK III IC		n/a	n/a	n/a	n/a	92/07

PMA280	IIIIIIIN	AIIIII	TOMAHAWK BASELINE IMPROVEMENT PROG	IC	n/a	n/a	94/09	98/4Q	01/1Q
PMA281	EEEEEEEN	AEEEE	THEATER MISSION PLANNING CENT UPGRAD	II	n/a	n/a	n/a	n/a	93/2Q
PMA281	0305154D	W2174	JOINT SERV IMAGING PROC SYS (JSIPS)	III	n/a	n/a	91/1Q	95/08	97/07
PMA281	0604367N	A1784-02	AFLOAT PLANNING SYS (APS)	III	n/a	n/a	88/4Q	93/09	94/08
PMA282	0204229N	A0545-01	ADV TOMAHAWK WPN CONTROL SYS (ATWCS)	III	n/a	n/a	94/09	n/a	98/4Q
PMA290	0204215N	H0538-02	P-3 SUSTAINED READINESS PROGRAM	II	94/09	94/09	94/09	n/a	94/09
PMA290	0604221N	H2180	P-3 ASUW IMPROVEMENT PROGRAM	II	94/09	94/09	94/09	n/a	94/09
PMA290	0204234N	109-87	S-3 COMMUNICATIONS CONTROL GROUP	III	n/a	n/a	n/a	88/1Q	93/2Q
PMA290	0204234N	054100-02	S-3 CO-PROCESSOR MEMORY UNIT	IVT	n/a	n/a	88/2Q	96/06	99/2Q
PMA290	0204234N	20-95	S-3 CRITICAL AVIONICS UPGRADE	IVT	95/10	95/10	95/10	n/a	95/10
PMA290	0204234N	HXX-94	S-3B COMMUNICATIONS IMPROVEMENT PROG	IVT	95/3Q	95/3Q	95/3Q	n/a	95/06
PMA290	0204251N	H28-92	P-3 GPS	IVT	n/a	n/a	n/a	n/a	95/1Q
PMA290	0305154N	14-95	EP-3E SENSOR SYSTEM IMPROVEMENT PROG	IVT	n/a	n/a	n/a	95/3Q	96/03
PMA290	0204155N	32-95	ES-3A CRITICAL AVIONICS	IVM	96/1Q	96/1Q	96/1Q	n/a	96/1Q
PMA290	0204155N	33-95	ES-3A CRITICAL STRUCTURES/SLAP/SLEP	IVM	96/1Q	96/1Q	96/1Q	n/a	95/11
PMA290	0204155N	H79-88	ES-3A COMMUNICATIONS IMPROVEMNT PROG	IVM	95/06	95/06	95/06	n/a	95/06
PMA290	0204155N	XX	ES-3A CRITICAL AVIONICS UPGRADE	IVM	96/3Q	96/3Q	96/3Q	n/a	96/04
PMA290	0204234N	12-95	S-3 CRITICAL STRUCTURES	IVM	96/1Q	96/1Q	96/1Q	n/a	96/1Q
PMA290	0204234N	XX-95	S-3B USH-42 MISSION RECORDER/REPRODR	IVM	n/a	n/a	n/a	n/a	95/1Q
PMA290	AAAAAAN	HAAAA	EP-3E COMMON IMPROVEMENT PROGRAM	IVM	n/a	n/a	n/a	n/a	97/1Q
PMA299	0604219N	H0485-03	AIRBORNE LOW FREQUENCY SONAR (ALFS) <b>Rebman</b>		n/a	87/3Q	91/12	n/a	99/2Q
PMA299	BBBBBBBN	HBBBB	CH-60 - <b>B. Rebman</b> ID		n/a	n/a	98/2Q	98/2Q	00/4Q
PMA299	0204243N	060510	LAMPS MK III BLOCK II (SH-60R)- <b>B. Rebman</b> IC		n/a	n/a	93/4Q	00/2Q	03/1Q
PMA299	0204243N	10-97	SH-60B ARMED HELO PROGRAM - <b>B. Rebman</b> III		n/a	n/a	n/a	96/3Q	99/2Q

PMBS/AF	0305205F		PREDATOR (USAF LEAD)	II	n/a	n/a	n/a	n/a	n/a
PMTS	0305204D	W8865	TACTICAL CONTROL SYSTEM (TCS)	II	n/a	97/03	99/3Q	n/a	n/a
PMUAV	0305154D	A8825	TACTICAL UAV (CLOSE RANGE)	NON	n/a	n/a	n/a	n/a	n/a
PMW/A-187	SSSSSSSN	WSSSS	GPS INTEGRATIONS	III	n/a	n/a	n/a	n/a	n/a
PMW/A-187	0604264N	WWWWW	COMBAT SURV EVADR LOCATR (CSEL) (AF)	III	92/08	n/a	95/11	98/4Q	00/3Q
PMW/A-187	0204161N	07188	CONTROL DISPLAY NAVIGAT UNIT (NDI)	IVT	n/a	n/a	92/2Q	n/a	94/12
PMW/A-187	0604777N	X0921-01	GPS INERTIAL NAVIGAT ASSEMBLY (NDI)	IVT	n/a	n/a	93/3Q	96/03	96/3Q
PMW/A-187	VVVVVVVN	WVVVV	DIGITAL DATA SET (DDS)	IVT	n/a	n/a	n/a	n/a	93/12
PMW/A-187	0204161N	07188	GPS/INTERIM PORTABLE RECEIVER	IVM	n/a	n/a	n/a	n/a	96/10