



# FY 2013 Annual Report on Cost Assessment Activities



March 2014

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# **FY 2013 Annual Report on Cost Assessment Activities**



## **Director, Cost Assessment and Program Evaluation**

**March 2014**

**The estimated cost of this report for the Department of  
Defense is approximately \$66,000 in Fiscal Years 2013-2014.  
This includes \$60,000 in expenses and \$6,000 in DoD labor.**

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## FOREWORD

The *Weapon Systems Acquisition Reform Act (WSARA) of 2009, Public Law 111-23*, was intended to reform defense acquisition processes and to bring cost growth under control. Section 101 of WSARA established the position of Director of Cost Assessment and Program Evaluation (CAPE) in the Office of the Secretary of Defense (OSD). The Director is responsible for ensuring that program cost and schedule estimates are properly prepared and considered in the Department's deliberations on major acquisition programs throughout the entire acquisition process.

WSARA requires the Director, CAPE to report to the Congress annually on the cost estimation and cost analysis activities that the Department conducted during the previous year, as well as the progress the Department has made in improving the accuracy of its cost estimates and analyses. This fifth edition of the annual report describes how the CAPE organization continues to mature in response to the objectives of the landmark legislation.

In light of the current challenging fiscal environment, the need for thorough analyses and rigorous cost assessments has never been greater. Independent, rigorous, unbiased cost and schedule estimates, paired with thorough risk assessments, are essential for effective acquisition decision making and oversight. Work continues to make the cost assessment process more effective, efficient and timely. Our commitment to continually improving our processes requires right-sized manpower, relevant training for the cost assessment community, and investments in improved analytic methods, tools, and data. Our progress in all of these areas is described in this report.

A handwritten signature in black ink, appearing to read "Scott A. Comes". The signature is fluid and cursive, with a large initial "S" and a long, sweeping tail.

Scott A. Comes  
Deputy Director, Program Evaluation  
Performing the Duties of the Director

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## CHAPTER I – INTRODUCTION

The office of Cost Assessment and Program Evaluation (CAPE) is responsible for providing unbiased, independent cost estimates for all major acquisition programs; ensuring that program cost and schedule estimates are properly prepared and considered in the Department’s deliberations on major acquisition programs; and providing guidance and oversight for Analyses of Alternatives (AoAs) to ensure that the Department considers the full range of program and non-materiel solutions. Additionally, the Director, CAPE is responsible for leading the development of improved analytical skills and competencies within the cost assessment and program evaluation workforce of the Department. Finally, the Director serves as a key advisor to the Secretary and Deputy Secretary of Defense for the programmatic development of the Department’s Future Years Defense Program (FYDP).

This report is concerned with cost estimation and cost analysis for major acquisition programs (i.e., Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) programs).

Section 2334(f) of title 10, *United States Code*, requires that CAPE submit an annual report<sup>1</sup> to the Congress on an assessment of:

- (A) the extent to which each of the military departments and Defense Agencies have complied with policies, procedures, and guidance issued by the Director with regard to the preparation of cost estimates for major defense acquisition programs and major automated information systems;
- (B) the overall quality of cost estimates prepared by each of the military departments and Defense Agencies for major defense acquisition programs and major automated information system programs; and
- (C) any consistent differences in methodology or approach among the cost estimates prepared by the military departments, the Defense Agencies, and the Director.

The organization of this report is as follows:

- Chapter II provides an overview of cost analysis in the Department of Defense (DoD). It describes the range of cost analysis organizations throughout the Department and explains the process for preparing cost estimates that support the

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<sup>1</sup> The scope of this report was expanded by section 812 of the *National Defense Authorization Act for Fiscal Year 2014, Public Law 113-66*. The above cited provision reflects the report requirements in effect prior to section 812. Beginning next year, CAPE will be required to annually review cost and associated information in program Selected Acquisition Reports (SARs), and to include in this annual report (1) a summary of the cost and associated information reviewed, (2) an identification of any trends in that information, (3) an aggregation of the cumulative risk of the portfolio of systems reviewed, and (4) recommendations for improving cost estimates on the basis of the review.

defense acquisition process. It also identifies the main DoD systems that collect actual information on the contract and government costs of programs.

- Chapter III reviews the Department's Fiscal Year (FY) 2013 cost estimation and cost analysis activities associated with MDAPs and MAIS programs. These activities include independent cost estimates (ICEs), as well as CAPE reviews of military department and Defense Agency cost estimates, which inform the DoD decision authorities at milestone reviews and at other acquisition decision points. This chapter also summarizes the degree to which DoD cost estimation and assessment activities in FY 2013 complied with established procedures, and discusses overall quality and any consistent differences in methodology among the cost estimates. Some of the notable highlights in this chapter are:
  - **F-22 Operating and Support (O&S) Costs:** As part of the Defense Acquisition Board (DAB) review of Increment 3.2B of the F-22 modernization program, CAPE and Air Force analysts spent considerable efforts to fully capture actual F-22 O&S costs per flying hour. The F-22 costs per flying hour are currently well above CAPE forecasts of costs per flying hour for the comparable variant of the fifth-generation F-35 aircraft (see page 19).
  - **Multi-Year Procurement:** In 2013, CAPE completed two more analyses of cost savings from the use of multi-year contract vehicles for aircraft programs. These analyses were made available to the congressional staff, and supported Department certifications that the programs met applicable statutory requirements prior to receiving authorization and appropriations from the Congress. Recent history of negotiated multi-year procurement contracts for aircraft programs have resulted in forecast savings of 10 to 18 percent (i.e., \$5.5 billion) since FY 2010. CAPE plans to work with the acquisition community and Congress on revising the applicable statutes to improve institutionalization and streamline the current process (see page 19).
  - **Realized Profits and Fees:** Electronic data warehouses of contractor cost reports are now being used to provide insight and to support multiple studies throughout the DoD cost and acquisition communities concerning contract profits and fees. Acquisition professionals are reviewing the information in order to assess the extent that realized profits and fees for completed acquisitions are compatible with current guidelines in defense policy and regulations (see page 26).
  - **Improvements in Methods and Processes.** CAPE is in the process of improving methods, tools and policies to better quantify the effects of expected Foreign Military Sales (FMS) on the business bases of organizations in the defense industrial base. The multi-year contract savings analyses developed in recent years have demonstrated the

importance of accurately accounting for the benefits of FMS in DoD cost estimates. In addition, more work needs to be done to improve the management and preparation of cost estimates for MAIS programs (see page 23).

- Chapter IV describes the status of several ongoing initiatives that will ensure that the cost assessment and cost estimating functions for the Department will change as required to meet the expanded roles and responsibilities established by WSARA and the needs of the Department. These initiatives address a wide range of issues and concerns, including organizations and human resources, cost estimating policies and procedures, cost tools and data systems, and education and training opportunities for the DoD cost community. Some of the notable highlights in this chapter are:
  - **Policies and Procedures:** CAPE completed a final draft of a new issuance that will replace DoD Manual 5000.04-M, *Cost Analysis Guidance and Procedures*, and placed the issuance into the formal coordination process. This issuance is the primary vehicle for implanting the cost assessment provisions of WSARA throughout DoD components. In addition, CAPE completed a final draft of the *O&S Cost-Estimating Guide* and distributed the document to the military department cost communities for review and comment (see pages 26–27).
  - **Full Cost of Manpower:** CAPE completed and issued DoD Instruction 7041.04, *Estimating and Comparing the Full Costs of Civilian and Active Duty Military Manpower and Contract Support*. The instruction establishes policy and provides procedures to estimate the full costs of active-duty, DoD civilian, and contract support manpower in support of workforce mix decisions. CAPE also developed and deployed an application tool to ease the calculation and comparison of the full cost of manpower, and the application has already been used to compare the costs of military and civilian intelligence personnel. We also assess that the tool will be useful in estimating the costs for the development and expansion of the cyber workforce (see page 27).
  - **Cost Assessment Data Enterprise (CADE):** CAPE, working with the military departments, has initiated the development of the CADE system that consists of a suite of automated net-based tools. This effort will greatly improve the productivity of our limited analyst resources by providing greater ease of access to data regarding actual costs incurred in programs. We anticipate that this system, together with new data analysis tools, will eventually enable the Department to move from cost analyses based solely on structured data, to include consideration of less structured or unstructured data in future cost analyses (see page 30).

- **Working More Closely with Military Department Cost Agencies:** Because of limitations and reductions in human resources devoted to the performance of the cost assessment mission throughout DoD, CAPE has begun to work more closely with each of the cost agencies in the military departments to develop cost estimates to support decision making throughout DoD. For example, CAPE works closely with and relies heavily upon the military department agencies in the management and preparation of cost estimates for MAIS programs (see page 23). In the process of further developing the relationship with the military departments, we have taken the first steps in moving from simple sharing of information and analyses to joint accomplishment of the analysis mission to support certain decision-making processes throughout the Department (see page 25).
- **Cost Indices:** WSARA requires that CAPE ensure that cost indices used by DoD have a sound basis and meet the Department's needs for realistic cost estimation. Work in this area continued in 2013, and CAPE has extended an earlier independent study on this subject. The follow-on study is now evaluating the best choice of product-specific indices by system commodity type, such as fighter aircraft (see page 31).
- **Use of Section 852 Funds:** CAPE is working with the Director of Procurement and Acquisition Policy to ensure that the entire cost analysis community in the Department retains access to use of Section 852 funds for purposes of training, education, and development of the human workforce (see page 26).
- **DoD Cost Analysis Symposium (DoDCAS):** Unfortunately, the Department was forced to cancel the DODCAS that was planned to be held in February 2013. This is the first time in 47 years that the Department was unable to conduct an annual cost analysis symposium due to fiscal constraints and new, restrictive rules on the conduct of professional meetings of all types. As a result of the cancellation, many of the analysts in the cost analysis community were not able to meet and discuss new techniques, methods, and data available to improve government cost estimates. The changes also resulted in the need for attendance at more expensive and less productive meetings for some in the DoD cost analysis community. We hope to reestablish a very limited version of the annual DoDCAS late in FY 2014, and reestablish the full-scope of the symposium in future years (see page 33).

The CAPE long-term vision is to ensure that the DoD cost estimating community is provided the necessary guidance, authorities, and resources to ensure that program cost and schedule estimates are properly prepared and considered in the Department's deliberations on MDAPs and MAIS programs. The completion of this objective will take

years, and the progress and challenges in achieving this vision will continue to be described in future editions of this report.

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## CHAPTER II – OVERVIEW OF COST ANALYSIS IN DoD

This chapter provides an overview of the current organizations, policies, procedures, and supporting data systems for cost estimation in place throughout DoD. Chapter IV of this report describes the efforts to continue to strengthen these institutions to meet the requirements of WSARA and the evolving needs of the Department.

This report assumes a modest familiarity with the defense acquisition process on the part of the reader. Readers in need of an introduction to the defense acquisition process are encouraged to refer to the *Defense Acquisition Guidebook* (<https://dag.dau.mil>).

### Overview of Cost Analysis Organizations in DoD

There are cost organizations throughout DoD—in the Office of the Secretary of Defense (OSD), at the headquarters of the DoD Components (military departments and Defense Agencies), and in the Components' field organizations. DoD has a wide range of cost organizations, with each group having a unique but complementary role in support of the defense acquisition process and the broader and diverse operations of the Department.

At the OSD level, the Director, CAPE is responsible for providing ICEs, for both MDAPs and MAIS programs, when the Milestone Decision Authority (MDA) for a program is the Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L)), under the specific circumstances explained later in this chapter. The Director, CAPE also provides policy for and oversight of preparation and review of DoD Component cost estimates for MDAPs and MAIS programs under other circumstances.

Each military department headquarters has its own cost agency. These cost estimating agencies provide ICEs when acquisition oversight is delegated to the Component and the MDA is the Component Head or Component Acquisition Executive. Also, the military department cost agencies provide policy guidance and provide specialized cost analyses unique to each of the military departments. The military department cost agencies reside in the financial management organizations of their military departments, and are outside their military department's acquisition chain of command.

There are also many field-level cost organizations. These organizations provide resources to support higher headquarters cost estimates and analyses, and they also provide assistance to support day-to-day operations of program offices and similar entities. Examples of such activities include evaluation of contractor proposals and should-cost analyses; support to competitive source selections; cost estimates in support of the programming and budgeting processes; and cost estimates used in specific analytic studies, such as systems engineering design trades or AoAs. Field-level elements of the cost community workforce typically possess important specialized cost and technical experience unique to specific system types or commodity groups--such as satellites, submarines, or tactical missiles.

Appendix A provides a brief description of the military department cost agencies and field-level cost organizations.

## Procedures for Cost Assessments at Milestone Reviews and Other Events

This section provides a description of DoD cost assessment procedures for MDAPs and MAIS programs, many of which have been updated or added after enactment of WSARA.

### Cost Assessment Procedures for Major Defense Acquisition Programs

Public law (section 2334 of title 10, *United States Code*) requires that an independent estimate of the life-cycle cost for an MDAP be prepared and presented to the MDA before the approval to proceed with Milestone A or B, or any decision to enter low-rate initial production or full-rate production.<sup>2</sup> At these milestone or other reviews, when the MDA is USD(AT&L), the ICE is prepared by the Director, CAPE. When the MDA is delegated to the DoD Component, the ICE supporting a milestone decision is provided by the applicable military department cost agency or the defense agency equivalent, and subsequently reviewed by CAPE. In either case, an ICE for a program in practice is conducted by using a combination of historical precedence, results of extensive site visits, and the actual performance of that program to date. It is a careful and comprehensive analysis that looks at all aspects of a program, including risks.

The framework for DoD policy and procedures for such ICEs and associated cost assessment activities is prescribed in Interim DoD Instruction 5000.02, *Operation of the Defense Acquisition System*. Additional guidance on the implementation of the prescribed policy and procedures is provided in DoD Manual 5000.04-M, *DoD Cost Analysis Guidance and Procedures*.

WSARA also revised the procedures for the certification of an MDAP that experienced sufficient cost growth to trigger a critical unit cost breach<sup>3</sup> (as defined in section 2433 of title 10, *United States Code*). Upon such a breach, USD(AT&L) can certify that the program meets certain criteria (set forth in section 2433a of title 10, *United States Code*), in which case the program can continue, or it may be terminated. One element of the required certification is the reasonableness of the new estimates of program unit costs. The determination that new program unit costs are reasonable is made by the Director, CAPE, and certified by USD(AT&L). As part of a standard business practice, CAPE prepares its own ICE that is used as a benchmark to support the assessment of reasonableness of the new unit cost estimates. Appendix B provides a description of the procedures for unit cost reporting and the criteria for a critical unit cost breach.

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<sup>2</sup> Section 2334 also requires an independent cost estimate in advance of a certification of an MDAP in a critical unit cost breach status (see Appendix B); in advance of a certification of a MAIS program in a critical change status (see Appendix C); and at any other time considered appropriate by the Director, CAPE or upon the request of USD(AT&L).

<sup>3</sup> A unit cost breach is commonly referred to as a Nunn-McCurdy breach.



## **Cost Assessment Procedures for Major Automated Information Systems**

WSARA specifies that CAPE is responsible for preparing an ICE for any MAIS program that has experienced a Critical Change (as explained in Appendix C) if the MDA is USD(AT&L). CAPE may also prepare an ICE for a MAIS program at any other time considered appropriate by the Director, CAPE, or upon the request of USD(AT&L). In addition, for the MAIS programs for which acquisition oversight has been delegated to the Component, CAPE is responsible for establishing policies for preparation and review of Component cost estimates at milestone reviews, and for revised program cost estimates in support of certification of a MAIS program that has experienced a Critical Change. A review of the FY 2013 cost assessment activities associated with certification of MAIS programs that experienced a Critical Change (where the MDA was USD(AT&L)) is provided in Chapter III.

In FY 2013, the assignment of MDA for the Department's 41 MAIS programs was a divided responsibility among USD(AT&L), the Deputy Chief Management Officer (DCMO), the DoD Chief Information Officer (CIO), and various Component Acquisition Executives. The DCMO was the MDA for MAIS programs that were regarded as defense business systems (used to support business activities, such as procurement, financial management, logistics, or human resource management). The DoD CIO was (and remains) the MDA for two MAIS programs that provide network and application security features (such as digital certificates and signatures, the Common Access Card (CAC), and other key-based security mechanisms). The various Component Acquisition Executives were (and remain) the MDAs for MAIS programs when acquisition oversight is delegated to a Component. These assignments were revised in the recent OSD Organizational Review led by former Secretary of the Air Force Mike Donley. As part of this review, MDA and other oversight responsibilities for defense business systems subject to OSD oversight were realigned from the DCMO to USD(AT&L) and the DoD CIO. This was done to permit the DCMO to focus on broad management, business oversight, and administrative organization issues within OSD and across DoD. In the new roles for defense business systems, the DoD CIO assists in the oversight of information technology and cyber security requirements and issues, while USD(AT&L) assumes primary responsibility for acquisition oversight. Currently, for the 41 MAIS programs, USD(AT&L) is the MDA for 22 programs; the DoD CIO is the MDA for two programs; and the various Component Acquisition Executives are the MDA for the remaining 17 programs.

## **Component Cost Position and Full Funding Commitment**

One important element of current DoD policy for major acquisition programs requires the Component to establish a formal position on the estimated cost of the program, and furthermore, to commit to fully fund the program consistent with the Component's cost position. The Component and the military department cost agency (or defense agency equivalent) establish a documented Component Cost Position for all MDAPs and MAIS programs prior to the Milestone A, B, and C reviews, and the Full-Rate Production

Decision (for an MDAP) or Full Deployment Decision Review (for a MAIS program). The Component Cost Position is signed by the appropriate military department's Deputy Assistant Secretary for Cost and Economics (or defense agency equivalent). Each Component has its own process to arrive at the Component Cost Position. In many cases, the Component establishes its cost position by performing a Component-wide corporate-level review, led by the military department cost agency (or defense agency equivalent), after consideration of a program office cost estimate and an assessment of that estimate by the military department cost agency.

At each milestone or other review, the Component must fully fund the program to the Component Cost Position in the current FYDP, or commit to full funding of the cost position in the next FYDP, with identification of specific offsets to address any funding shortfalls that may exist in the current FYDP. The Component Acquisition Executive and the Component Chief Financial Officer endorse and certify in a Full Funding Certification Memorandum that the FYDP fully funds, or will fully fund, the program consistent with the Component Cost Position.

### **Multi-Year Procurement**

Public law (section 2306b of title 10, *United States Code*) establishes several criteria that must be satisfied and certified by the Secretary of Defense prior to the award for a multi-year contract for supplies for a defense acquisition program. Some of these criteria (concerning substantial savings, realistic cost estimates, and availability of funding) must be supported by a CAPE cost analysis of the proposed multi-year procurement strategy and contract structure, which includes a comparison of the estimated costs of multi-year and annual contract awards. The analysis is based on actual cost data and experience to date, as well as an evaluation of cost realism in the contractor's proposals. A review of the FY 2013 cost assessment activities associated with approval of multi-year procurement contracts is provided in Chapter III.

### **Confidence Levels in Cost Estimates**

WSARA, as originally enacted, required (1) a statement concerning the confidence level used in establishing a cost estimate of an MDAP or a MAIS program, (2) the rationale for selecting the specific confidence level used in the estimate, and (3) the justification for selecting a lower confidence level if it were less than 80 percent. The WSARA requirement for confidence levels in cost estimates was modified by section 811 of the *National Defense Authorization Act for Fiscal Year 2011, Public Law 111-383* (section 2334 of title 10, *United States Code*). With this modification, there is no longer a requirement to justify the choice of a confidence level that is lower than 80 percent. Today, the legal requirement is to select a confidence level such that it provides a high degree of confidence that the program can be completed without the need for significant adjustment to program budgets. In general, CAPE satisfies this requirement by ensuring that all of its cost estimates are built on a product-oriented Work Breakdown Structure (WBS), based on historical actual cost information whenever possible, and most

importantly, based on conservative assumptions that are consistent with actual demonstrated contractor and government performance for a series of acquisition programs in which the Department has been successful.

### **Cost Estimates for Contract Negotiations**

Section 811 of the *National Defense Authorization Act for Fiscal Year 2011*, Public Law 111-383 (section 2334 of title 10, *United States Code*), established that for MDAPs and MAIS programs, cost estimates developed for baselines and other program purposes are not to be used for the purpose of contract negotiations or obligation of funds. Section 811 also states that cost analyses and targets developed for the purpose of contract negotiations shall be based on the government's reasonable expectation of successful contractor performance in accordance with the contractor's proposal and previous experience.

The procedures to implement these statutory requirements were developed as part of the Department's "Should Cost" initiative, which is intended to proactively target cost reduction and drive productivity improvement into major acquisition programs. These procedures are contained in Interim DoD Instruction 5000.02, *Operation of the Defense Acquisition System*. In this instruction, for MDAPs and MAIS programs, it is DoD policy to budget to the CAPE ICE unless an alternative estimate is specifically approved by the MDA. However, program managers are required to develop a "should cost" estimate as a management tool to control and reduce cost. The intention is that the ICE should not be allowed to become a self-fulfilling prophecy. The "Should Cost" initiative challenges managers to identify and achieve savings below budgeted most-likely costs. "Should Cost" analyses can be used during contract negotiations (particularly for sole source procurements) and throughout program execution, including sustainment. Further information on the "Should Cost" initiative is provided in the *Defense Acquisition Guidebook* (<https://dag.dau.mil>), section 10.15.2 ("Should-Cost").

### **Cost Analysis Requirements Description**

CAPE requires and provides guidance on the technical content and use of a document known as the Cost Analysis Requirements Description (CARD). The CARD provides information on the acquisition program that is used in preparation of both the Component Cost Position and the CAPE ICE. The CARD describes the key technical, programmatic, and operational characteristics of an acquisition program. The foundation of a sound and credible cost estimate is a well-defined program, and the CARD is used to provide that foundation.

### **DoD Cost Data Collection Systems**

Systematic and institutionalized cost data collection and validation is critical to the preparation and support of credible cost estimates. DoD has three primary collection systems for cost data for MDAPs. The Cost and Software Data Reporting (CSDR) system serves as the primary source of cost data for major contracts and subcontracts associated

with MDAPs and MAIS programs. The Earned Value Management (EVM) Central Repository is used to collect and archive EVM reporting documents (such as Integrated Program Management Reports). The Visibility and Management of Operating and Support Costs (VAMOSOC) systems collect historical O&S costs for fielded major weapon systems. Appendix D provides additional details concerning all of these data collection systems, and Chapter IV discusses current CAPE efforts to improve them.

## Summary

This chapter reviewed the cost assessment organizations, policies and procedures, and data collection systems in DoD. These provide the foundation on which the Department is building as it continues to implement WSARA and strengthen the cost assessment institutions. The initiatives that constitute this implementation and the vision of the changes that are being made are described in Chapter IV of this report.

## **CHAPTER III – DoD COST ASSESSMENT ACTIVITIES IN FY 2013**

This chapter provides a summary of the DoD cost estimates and cost analyses that were made in FY 2013 in support of MDAP milestone reviews and other acquisition decision points, award of multi-year procurement contracts, and certifications following MAIS critical changes. Note that there were no MDAP critical unit cost breaches in FY 2013 (for the first time since the Nunn-McCurdy provision was established in 1983).

### **MDAP Milestone or Other Review Cost Assessment Activities**

Table 1 provides a summary of the cost assessment activities in FY 2013 that supported milestone or other reviews. For each MDAP with a milestone review or other event, Table 1 identifies the program name and acronym, the responsible Component, the supporting cost estimate(s) or analyses presented to the MDA, and the review event being supported. There were 16 MDAP milestone reviews or other events supported by cost assessment activities in FY 2013 (excluding several cost assessment activities associated with classified programs, which are not discussed in this unclassified report).

**Table 1. Major Defense Acquisition Program Milestone or Other Review Cost Assessment Activities in FY 2013**

<b>Program Name</b>	<b>Acronym</b>	<b>Component</b>	<b>Program Type</b>	<b>Cost Assessment Activity</b>	<b>Activity Date</b>	<b>Supported Event</b>	<b>Event Date</b>
MQ-9 Reaper Unmanned Aircraft System	MQ-9 Reaper	Air Force	Acquisition Category (ACAT) ID	CAPE Independent Cost Estimate	4-Oct-12	Milestone C	21-Nov-12
				Air Force Cost Position	10-Sep-12		
GPS Next Generation Operational Control System	GPS OCX	Air Force	ACAT ID	CAPE Independent Cost Estimate	11-Oct-12	Milestone B	11-Oct-12
				Air Force Cost Position	18-Jun-12		
Navy Multiband Terminal	NMT	Navy	ACAT IC	Navy Cost Position	5-Nov-12	Full-Rate Production Decision	5-Nov-12
				Navy Independent Cost Estimate	2-Nov-12		
Airborne Warning and Control System Block 40/45 Upgrade	AWACS Blk 40/45	Air Force	ACAT IC	Air Force Cost Position	6-Nov-12	Full-Rate Production Decision	21-Dec-12
				Air Force Independent Cost Estimate	17-Oct-12		
B61 Mod 12 Life Extension Program Tail Kit Assembly	B61 Mod 12 LEP TKA	Air Force	ACAT ID	CAPE Independent Cost Estimate	9-Nov-12	Milestone B	9-Nov-12
				Air Force Cost Position	19-Oct-12		
Excalibur Precision 155mm Projectiles Block 1b	Excalibur Block 1b	Army	ACAT IC	Army Cost Position	15-Nov-12	Milestone C	12-Dec-12
				Army Independent Cost Estimate	1-Nov-12		

**Table 1. Major Defense Acquisition Program Milestone or Other Review Cost Assessment Activities in FY 2013 (cont.)**

<b>Program Name</b>	<b>Acronym</b>	<b>Component</b>	<b>Program Type</b>	<b>Cost Assessment Activity</b>	<b>Activity Date</b>	<b>Supported Event</b>	<b>Event Date</b>
B-2 Extremely High Frequency SATCOM and Computer Increment 1	B-2 EHF Inc 1	Air Force	ACAT IC	Air Force Cost Position	18-Dec-12	Full-Rate Production Decision	21-Dec-12
				Air Force Independent Cost Estimate	24-Jul-12		
Evolved Expendable Launch Vehicle	EELV	Air Force	ACAT ID	CAPE Independent Cost Estimate	18-Jan-13	Milestone C restoration	10-Feb-13
				Air Force Cost Position	10-Dec-12		
E-2 D Advanced Hawkeye Aircraft	E-2D AHE	Navy	ACAT ID	CAPE Independent Cost Estimate	30-Jan-13	Full-Rate Production Decision	12-Feb-13
				Navy Cost Position	29-Nov-12		
Standard Missile-6	SM-6	Navy	ACAT ID	CAPE Independent Cost Estimate	13-May-13	Full-Rate Production Decision	24-May-13
				Navy Cost Position	6-May-13		
F-22 Modernization Increment 3.2B	F-22 Mod Inc 3.2B	Air Force	ACAT ID	Updated CAPE Independent Cost Estimate	16-May-13	Milestone B	26-Jun-13
				Air Force Cost Position	3-May-13		
Air and Missile Defense Radar	AMDR	Navy	ACAT ID	CAPE Independent Cost Estimate	29-May-13	Milestone B	4-Oct-13
				Navy Cost Position	17-Jan-13		

**Table 1. Major Defense Acquisition Program Milestone or Other Review Cost Assessment Activities in FY 2013 (cont.)**

<b>Program Name</b>	<b>Acronym</b>	<b>Component</b>	<b>Program Type</b>	<b>Cost Assessment Activity</b>	<b>Activity Date</b>	<b>Supported Event</b>	<b>Event Date</b>
MQ-1C Gray Eagle Unmanned Aircraft System	MQ-1C Gray Eagle	Army	ACAT ID	CAPE Independent Cost Estimate	13-Jun-13	Full-Rate Production Decision	26-Jul-13
				Army Cost Position	9-May-13		
Next Generation Jammer	NGJ	Navy	pre-MDAP	CAPE Independent Cost Estimate	2-Jul-13	Milestone A	8-Jul-13
				Navy Cost Position	4-Mar-13		
Littoral Combat Ship Mission Modules	LCS MM	Navy	ACAT IC	CAPE Independent Cost Estimate	22-Jul-13	Milestone B	7-Jan-14
				Navy Cost Position	6-Feb-13		
				Navy Independent Cost Estimate	29-Nov-12		
HC/MC-130 Recapitalization Aircraft	HC/MC-130 Recap	Air Force	ACAT IC	Air Force Cost Position	9-Sep-13	Full-Rate Production Decision	4-Oct-13
				Air Force Independent Cost Estimate	21-May-13		

**Notes:**

The term "ACAT ID" refers to an MDAP where the MDA is USD(AT&L).

The term "ACAT IC" refers to an MDAP where acquisition oversight has been delegated to the Component.

The term "pre-MDAP" refers to a program activity that is anticipated to result in an MDAP upon formal program initiation into the defense acquisition management process (which usually occurs at Milestone B).



## Remarks about Specific Programs

- The CAPE ICE for the Evolved Expendable Launch Vehicle (EELV) supported the restoration of the Milestone C approval for the program. The EELV lost its original Milestone C approval following the critical unit cost breach that occurred in 2012.
- For the DAB review of Increment 3.2B of the F-22 modernization program, CAPE and Air Force analysts spent considerable efforts to fully capture actual F-22 O&S costs per flying hour. The F-22 costs per flying hour are currently well above CAPE forecasts of costs per flying hour for the comparable variant of the fifth-generation F-35 aircraft. The CAPE ICE also recommended, and the Acquisition Decision Memorandum (ADM) directed, that the Air Force periodically report on the budgeted resources for total F-22A costs, including the original baseline program and additional modernization efforts, at subsequent Defense Acquisition Executive Summary (DAES) reviews. The ICE also recommended that in the future, F-22A modernization and other similar MDAP-level block upgrade programs should report on total fleet O&S costs to improve the transparency and accountability of the cost impacts due to the upgrades.
- In October 2012, USD(AT&L) issued an ADM for the Littoral Combat Ship Mission Modules, designating it as an ACAT IC program and delegating acquisition authority to the Navy. CAPE supported the Navy's subsequent Milestone B review by providing an ICE for the Navy's consideration. In general, CAPE supports the acquisition review decisions of ACAT IC programs by conducting an assessment of Component cost estimates and Component Cost Positions, or in some cases generating its own ICE. This responsibility is intended to satisfy the intent of WSARA and provide higher quality cost positions for senior acquisition executives.

## CAPE Independent Cost Estimates for Multi-Year Procurement

As noted in Chapter II, CAPE provides an ICE of a proposed multi-year procurement strategy and contract structure to support the Department's certification of substantial savings and other criteria, prior to the award of a multi-year contract for a defense acquisition program. Table 2 provides a summary of the cost assessment activities in FY 2013 supporting the award of multi-year procurement contracts. Table 2 identifies the program name and acronym, the responsible Component, the supporting cost estimate(s) or analyses, and the date of the Department's certification.

The Congress must provide the authority for a multi-year procurement contract prior to contract award. This authority must be provided in both authorization and appropriation acts for proposed multi-year contracts greater than \$500M. For each of the E-2D AHE and C-130J aircraft procurements, the Congress provided authority for a multi-year contract in both the FY 2014 defense authorization act as well as the FY 2014

consolidated appropriations act. However, at the time this report was written, awards of multi-year procurement contracts for these two programs remain pending.

For several aircraft program multi-year procurement contracts approved and negotiated during the past four years, DoD has obtained forecast savings in the range of 10 to 18 percent (\$5.5 billion) relative to the costs of using annual procurement contracts through the use of multi-year procurement contracts. These savings are measured relative to a baseline cost estimate prepared by CAPE, based on use of annual contracting strategies, of approximately \$28 billion in procurement costs for five major aircraft programs. More recently, the estimates of savings for the E-2D AHE and the C-130J were consistent with the estimated percentage savings for the earlier aircraft programs. The use of multi-year procurement contracts for these programs will provide substantial savings of acquisition resources to the military departments involved in the programs during the next five years. CAPE plans to work with the acquisition community and Congress on revising the applicable statutes to improve institutionalization and streamline the current process.

**Table 2. Cost Analyses in FY 2013 for Multi-Year Procurement Contract Awards**

<b>Program Name</b>	<b>Acronym</b>	<b>Component</b>	<b>Program Type</b>	<b>Cost Assessment Activity</b>	<b>Activity Date</b>	<b>Supported Event</b>	<b>Event Date</b>
E-2D Advanced Hawkeye Aircraft	E-2D AHE	Navy	ACAT ID	CAPE Independent Estimate of Savings for Multi-Year Procurement Contract	28-Feb-13	USD(AT&L) certification	1-Mar-13
C-130J Hercules Transport Aircraft	C-130J	Air Force	ACAT IC	CAPE Independent Estimate of Savings for Multi-Year Procurement Contract	28-Feb-13	USD(AT&L) certification	1-Mar-13

## **MAIS Critical Change Cost Assessment Activities**

Table 3 provides a summary of the cost assessment activities in FY 2013 supporting certification decisions associated with MAIS critical changes. For each major acquisition program with a critical change, Table 3 identifies the program name and acronym, the responsible Component, the supporting cost estimate(s) or analyses presented to the USD(AT&L), and the date of the critical change certification provided to the Congress. Descriptions of MAIS reporting and the certification process associated with unit cost breaches are provided in Appendix C.

There were two MAIS critical change certifications in FY 2013. Both of them were supported by the appropriate cost estimates and analyses that complied with the requirements of WSARA and the established cost assessment procedures described in Chapter II. For the critical change certifications, each event was supported by a CAPE ICE and a Component Cost Position.

**Table 3. Major Automated Information System Critical Change Cost Assessment Activities in FY 2013**

<b>Program Name</b>	<b>Acronym</b>	<b>Component</b>	<b>Program Type</b>	<b>Cost Assessment Activity</b>	<b>Activity Date</b>	<b>Supported Event</b>	<b>Event Date</b>
Global Combat Support System-Marine Corps/ Logistics Chain Management Increment 1	GCSS-MC/LCM Inc 1	Navy	ACAT IAM	CAPE Independent Cost Estimate	7-Aug-13	Critical Change Certification	6-Sep-13
				Navy Cost Position	17-Jun-13		
Air and Space Operations Center – 10.2 Weapon System Increment	AOC-WS Inc 10,2	Air Force	ACAT IAM	CAPE Independent Cost Estimate	20-Aug-13	Critical Change Certification	12-Oct-13
				Air Force Cost Position	15-May-13		

## Assessment of Compliance, Quality, and Differences in Methodology

All of the events noted in Table 1 through Table 3 were supported by the appropriate cost estimates or analyses that complied with the requirements of WSARA and the established cost assessment procedures described in Chapter II. In particular, each MDAP and MAIS milestone or other review was supported by (1) a Component Cost Position and (2) the appropriate CAPE or military department cost agency ICE. In addition, CAPE provided an independent analysis of savings associated with each proposed multi-year procurement strategy. Additional information about the compliance of CSDR data reporting is provided in Appendix D.

The overall quality of the cost estimates prepared by each of the military departments continued to improve this year due to increased rigor. As noted in Chapter II, DoD has instituted a policy—currently in place for all MDAPs—requiring that a signed, dated Component Cost Estimate and a Component Cost Position must be delivered to CAPE prior to delivery of an ICE to support each milestone or other review of the DAB. Also, the military department’s financial and acquisition leadership must provide a statement affirming their commitment to fully fund the program to the Component Cost Position during the preparation of the next Program Objective Memorandum and President’s Budget FYDP.

The quality of the cost estimates for MDAPs provided by the military departments also continued to improve this year due to better data. This is largely attributable to improved availability of actual cost information for DoD programs as a result of the long-term initiative to collect contractor cost and software data reports, and the long-term efforts of each of the military departments to improve the collection of actual O&S cost information through the VAMOS systems. Further information about DoD cost data collection systems is provided in Chapter IV and Appendix D.

There are no consistent differences in methodology or approach between the cost estimates prepared by the military departments and CAPE. Generally, the approach employed by the military departments is evolving to become more similar to that employed in CAPE: collect actual cost information from ongoing and historical programs in a product-oriented taxonomy; use that information to prepare cost and schedule forecasts for new programs or programs proceeding to the next milestone in the acquisition process; and review the actual cost information collected, as each individual program proceeds, to update and adjust the cost and schedule forecasts for the program to reflect actual experience. The goal is for the Department to improve the systematic collection of actual cost information over time, resulting in smaller differences between the cost and schedule forecasts of the military departments and CAPE in the future.

Despite the progress in improving the quality of cost estimates throughout the Department, there remain serious concerns about the quality of cost estimates in the future due to the current budget constraints and the fiscal uncertainty experienced in the most recent year. CAPE and the military department cost agencies are subject to the

Secretary's directive to reduce staffing and funding for headquarters operations, and the other major cost organizations face similar budget pressures. For the most part, the major cost organizations are currently operating under a hiring freeze, although some personnel attrition may be replaced on an exception basis, subject to waiver, meeting certain conditions. These pressures also provide significant constraints on each organization's abilities to invest in cost tools and research, support training and education of the workforce, and maintain the recent progress in cost data collection. Moreover, the budget environment has affected the morale of the entire cost community workforce. The recent experience with furloughs, government shutdowns, and the threat of additional government shutdowns negatively affects the retention of the current workforce as well as the ability to recruit the next generation of cost analysis personnel. The plans and ongoing initiatives of CAPE and the larger cost community to deal with the challenges of this environment are discussed in Chapter IV.

### **Areas for Improvement**

In a few cases, our cost estimates involved programs that had plans or the potential for FMS. FMS cases have significant potential benefits in lowering the costs of programs to the United States, since the procurement of additional systems will lead to unit cost reductions for all parties. In some cases, the foreign country may also contribute to the recoupment of prior development costs. However, quantifying these benefits in cost estimates can often be challenging, due to the complexities of issues such as coproduction, tie-ins with United States multi-year procurement contracts, and forecasting the effects on contractor business bases and rates. CAPE is now evaluating how to improve the cost community tools, methods, and policies for these cases.

For MAIS programs, due to resource constraints, direct CAPE involvement in preparing cost estimates has been limited to those programs for which the MDA is USD(AT&L) that experience a critical change. For other reviews of MAIS programs, CAPE works closely with and relies heavily upon the military department agencies in the management and preparation of cost estimates. In addition, contract cost data reporting for the MAIS programs currently is poor, and both quality and compliance need to be improved. There remains much work to be done to improve the management and preparation of cost estimates for the approximately 40 programs now in the DoD portfolio of MAIS programs and automated information systems expected to become MAIS programs in the near future.

### **Other Cost Assessment Activities in FY 2013**

#### **Missile Defense Agency Support**

CAPE received requests from the Missile Defense Agency (MDA) in 2013 to assess several MDA programs. As MDA operates largely outside of DoD 5000 regulations, CAPE's cost assessment role is typically limited to supporting the agency's production decisions as defined by the initial use of procurement funds. CAPE does not typically

conduct cost assessments for MDA development efforts and systems acquired using Research, Development, Test and Evaluation funds. To support a production decision on Standard Missile-3 (SM-3) Block IB initially planned for FY 2014, MDA requested that CAPE support the review by developing an ICE. CAPE plans to complete this ICE in FY 2014.

In addition, MDA requested that CAPE perform cost analyses to determine if the use of a multi-year procurement strategy would result in substantial savings for an SM-3 Block IB missile contract and a Terminal High Altitude Area Defense (THAAD) interceptor contract. CAPE plans on conducting these analyses during FYs 2014–2015 to support consideration for possible inclusion in the FY 2016 President’s Budget request.

### **National Nuclear Security Administration Support**

Based on requests from the Nuclear Weapons Council (NWC), chaired by USD(AT&L), CAPE continued to assess various aspects of the National Nuclear Security Administration (NNSA) programs and revitalization of the weapons complex. On the weapons side, CAPE performed initial assessments that enabled appropriate budgeting for two proposed weapon system life extension efforts. On the complex modernization side, CAPE worked with NNSA headquarters and national laboratory personnel to assess plutonium strategy alternatives for the NWC and the Congress. Also, CAPE performed an independent assessment of the Y-12 Uranium Processing Facility required by the *National Defense Authorization Act for Fiscal Year 2013*, Public Law 112-239.

CAPE also assessed how economic and fiscal pressures have affected the costs of operating the nuclear weapon complex. The analysis documented trends in salaries, fringe benefits, other components of labor costs, materials, and equipment at the national laboratories and several production facilities.

CAPE directed nearly 5,000 man-hours in FY 2013 in support of NNSA, and this support is expected to continue to be a large effort in the future. It is currently planned to have NNSA personnel augment CAPE staff in preparation of future ICEs for NNSA activities.

### **Realized Profits and Fees**

Electronic data warehouses of CSDR reports are now being used to provide insight and support multiple studies throughout the DoD cost and acquisition communities concerning contract profits and fees. Acquisition professionals are reviewing the information in order to assess the extent that realized profits and fees for completed acquisitions are compatible with current guidelines contained in defense policy and regulations.



## **CHAPTER IV – THE LOOK FORWARD**

WSARA introduced major reforms to the DoD cost estimation processes. Since its enactment, CAPE has made significant progress in implementing these reforms. This chapter discusses the status and future plans for several key initiatives that collectively will provide this implementation.

### **Cost Leadership Forum**

The CAPE Deputy Director for Cost Assessment has established a periodic meeting with the senior leaders and staff of the military department cost agencies (known as the Cost Leadership Forum), to discuss issues of common interest to the community. The intent is to establish greater collaboration among CAPE and the military department cost organizations by sharing analytic best practices, and developing a collective vision of the path forward for the cost community over the next five years in meeting the WSARA objectives, improving cost analysis, and dealing with the challenges of the current constrained resource environment. This collaboration and collective vision is being pursued to lead to more efficient business processes, while maintaining the independence of CAPE and Service ICES, and protecting the internal deliberations within each military department and its respective cost agency.

A two-day meeting was held on August 19–20, 2013. The Cost Leadership Forum discussed the following topics:

- Organizational status and human resources
- Cost assessment policies and procedures
- Defense Cost and Resource Center (DCARC) status
- CADE project
- Training and education for the cost community
- Collective vision for the cost community

The current plans and ongoing initiatives for each of these topics are described in the remainder of this chapter. The Cost Leadership Forum will continue to meet periodically and provide executive oversight for these and other initiatives.

### **Organizations and Human Resources**

As explained in Chapter II, the DoD cost analysis workforce is distributed among several organizations throughout the Department. Consequently, identifying and remedying issues with the needed size, education, experience, organization and reporting relationships of the DoD cost analysis workforce requires an integrated and collaborative effort with the major DoD cost organizations, using the Cost Leadership Forum as a venue, with CAPE as the leader and primary advocate for the entire DoD cost community.

Efforts toward that end began last year with activities to gather data on the workforce size, grade, and demographics, as well as experience and education levels. Beyond that, there is interest in measuring projected workload volume and content (i.e., what the cost assessment community is actually doing), to help assess whether scarce resources are properly focused on strategic priorities. However, these efforts, as well as the anticipated growth in the staffing of CAPE and other DoD cost organizations, were suspended due to the tremendous uncertainty in the projected DoD budget and personnel levels. OSD and the military departments have been operating under a hiring freeze, and face the possibility of further civilian reductions due to the fiscal environment and the Secretary's directive to reduce staffing and funding for headquarters operations by 20 percent.

Nevertheless, despite these challenges, CAPE intends to work with the leaders of the military department cost agencies and resume the collaborative activities needed to determine the size, shape and organization of the DoD cost community aligned to meet current and future needs. Workforce management will be more critical in the future as the cost community faces downsizing pressures along with the rest of the Department. To help mitigate these pressures, it will be important for CAPE, working with the other senior members of the Cost Leadership Forum, to increase the collaboration among the major cost organizations and achieve significant efficiencies in cost assessment activities that will be less labor intensive and time consuming. Initiatives aimed to achieve such efficiencies, such as investments in automated tools, as well as improved training and education for the cost community, are described in the remainder of this chapter.

CAPE is also evaluating the feasibility and desirability of establishing a fraction of the cost assessment staff as members of the Defense Acquisition Workforce. This would ensure that some of the CAPE cost analysts would also meet the continuing education, training, and experience standards required to qualify as certified acquisition professionals. These analysts also would be eligible for training and education funding provided by the Defense Acquisition Workforce Development Fund (section 852 of the *National Defense Authorization Act for Fiscal Year 2008*, Public Law 110-181). However, CAPE is committed to ensuring that the entire cost community continues to receive access to section 852 funding.

## **Policies and Procedures**

WSARA states that the Director, CAPE—in consultation with other officials of OSD, the military departments, and Defense Agencies—shall prescribe policies and procedures for the conduct of cost estimation and cost analysis for the major acquisition programs of the DoD.

CAPE completed a final draft of a new issuance that will replace DoD Manual 5000.04-M, *Cost Analysis Guidance and Procedures*, and placed the issuance into the formal coordination process. This issuance is the primary vehicle for implanting the cost assessment provisions of WSARA throughout DoD components. In particular, it provides guidance to the military departments and Defense Agencies concerning the preparation,

presentation, and documentation of life-cycle cost estimates for major acquisition programs. It assigns roles and responsibilities, and describes the process and the timeline, for each of the following:

- Preparation of CAPE ICEs supporting a USD(AT&L) decision review
- CAPE review of Component ICEs supporting a Component decision review
- Preparation of CAPE multi-year procurement cost analyses
- CAPE cost analyses supporting a critical unit cost breach certification
- CAPE cost analyses supporting a MAIS critical change certification

The Manual provides streamlined guidance for the content of the CARD that describes the technical and programmatic characteristics of a program for the purpose of preparing a cost estimate. The Manual also provides standard life-cycle cost terms and definitions that are used throughout DoD in cost estimation and cost data collection.

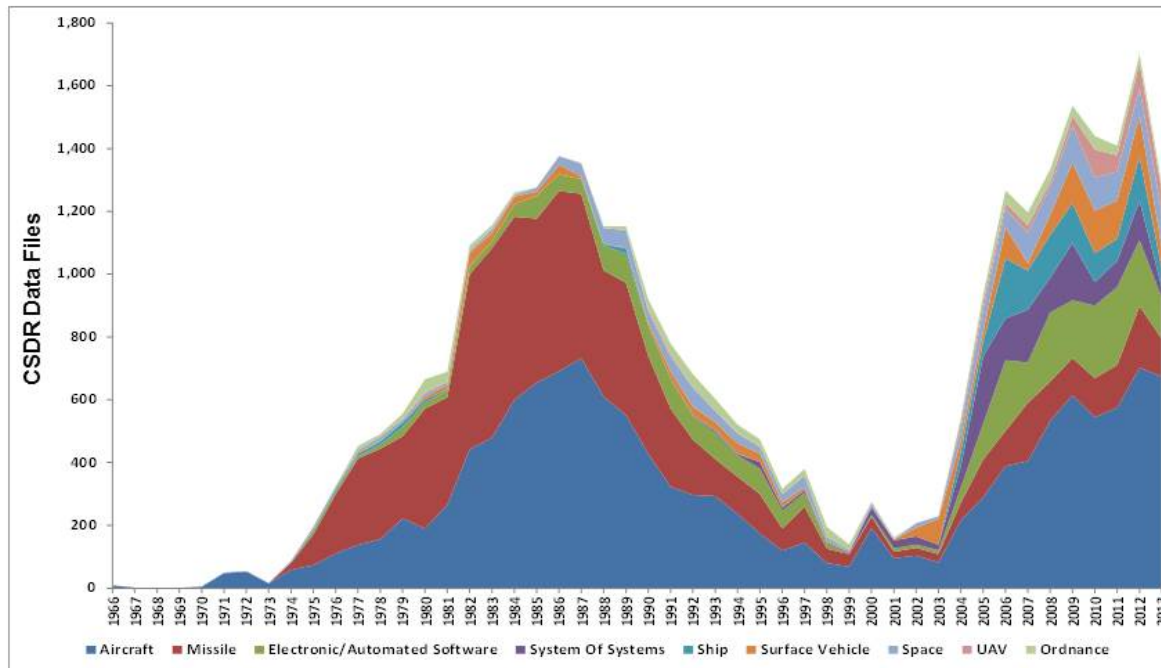
CAPE completed a final draft of the 2013 *O&S Cost-Estimating Guide* and distributed the document to the military departments for review and comment. This guide explains and illustrates how O&S cost estimates and analyses can support key program decisions throughout the life cycle. The guide provides a tutorial on the best practices for preparing, presenting, and documenting O&S cost estimates. The guide also addresses new legislative requirements for major weapon system O&S costs. The *National Defense Authorization Act for Fiscal Year 2012*, Public Law 112-81, established a provision concerning “Assessment, Management and Control of O&S Costs” that mandates several ambitious requirements intended for DoD to take specific steps to improve its processes concerning cost estimating and management of major system O&S costs. In particular, the provision requires the Department to periodically update estimates of program O&S costs, and track and assess these estimates relative to prior estimates. The guide describes how the Department has implemented this legislative provision in various DoD instructions and regulations, and provides recommended approaches and analytic methods for dealing with these new requirements.

CAPE completed and issued DoD Instruction 7041.04, *Estimating and Comparing the Full Costs of Civilian and Active Duty Military Manpower and Contract Support*. The instruction establishes policy and provides procedures to estimate and compare the full costs of active duty military, DoD civilians, and contract support. The business rules, potential cost factors, and data sources provided in this instruction will be used in cost-benefit analyses or business case analyses in support of workforce mix decisions. To support the DoD community in performing the numerous calculations required by this instruction, CAPE has made available a web-enabled tool for estimating the Full Cost of Manpower (FCoM), which will automatically calculate all cost elements required to maintain consistency with guidance in the instruction. The FCoM tool is available on the CAPE website ([www.cape.osd.mil](http://www.cape.osd.mil)) and is usable by all personnel who possess a valid CAC. The tool has already been used to compare the costs of military and civilian intelligence personnel, and in the future will be used to estimate manpower costs for the development and expansion of the cyber workforce.

## Cost Data Systems

The DCARC is the CAPE field office responsible for administering the CSDR system. An increased management emphasis throughout the Department concerning the importance of cost data reporting has resulted in significant increases in the quantity of cost data reports compared to the acquisition reform era of the 1990s. Figure 1 shows the annual volume of CSDR data reports collected by the DCARC for each of the major system commodities.

## Figure 1. CSDR Data Collection Over Time



1990s reform efforts limited cost data collection and damaged DoD's ability to produce quality cost estimates

Figure 1. CSDR Data Collection over Time

The management emphasis on cost data reporting is not limited to the quantity of data reports collected. The DCARC has ongoing initiatives to improve business processes and data quality, and maintain a high degree of compliance in reporting requirements. The DCARC hosts semiannual CSDR Focus Group meetings that provide a forum for DoD and industry stakeholders to discuss evolving CSDR policies and processes, and raise any issues or concerns. The DCARC continues to provide on-site training to users and data providers at various locations several times each year. This training addresses CSDR policies, CSDR plan construction and subsequent reporting requirements, and DCARC information technology systems and applications.

Improved versions of the CSDR electronic report formats and instructions to reporting contractors are being developed based on feedback from government users about desired report enhancements. In addition, the DCARC is working with government users to determine desired improvements to the plant-wide overhead report, and the sizing and productivity metrics used for software reporting.

In addition to the CSDR system, DoD has two other cost data reporting systems. The EVM Central Repository is used for the centralized electronic warehousing of EVM data reports, and the VAMOSC data systems are used to collect O&S costs for the major fielded weapon systems. Additional information on all three of these data systems is provided in Appendix D.

### **Cost Assessment Data Enterprise**

In a time of declining budgets and inability to grow the government's analytical workforce, CAPE initiated the development of the CADE: the Department's unified initiative to collect, organize and use data more efficiently. CAPE is partnering with the military department cost agencies and the USD(AT&L) staff to incrementally work towards its CADE vision of the government analyst's command and control website, housing seamless integrated authoritative data sources that are easily searchable and retrievable.

CADE will increase analyst productivity and effectiveness and improve data quality, reporting compliance and source data transparency. In addition to improving internal government processes and requirements, CAPE is working with industry to achieve more efficient and better data transfers, taking the process from retyping in data from old pdf reports to push-of-the-button electronic data exchange and retrieval. The project will automate common views of data that help to begin telling a program's story, which previously took analysts months to create.

The goal is to reduce time spent on ad hoc data collection and validation, allowing more time for actual analysis at a much deeper level, and quicker ability see how a program is performing between major reviews. CAPE, with its partners in the military department cost agencies and USD(AT&L), is taking on through CADE the integration of cost and technical data including EVM reports, CSDR reports, and O&S data. This involves a

major effort of consolidating an authoritative collection of historical data and ensuring that all future data collected is exactly what the cost community needs to best perform. CAPE is working with USD(AT&L) to capitalize on the acquisition data already collected in the Defense Acquisition Visibility Environment (DAVE) and to integrate it with our cost data for a full government analyst view of a weapons program or portfolio. This initiative will increase productivity of analysts and will also provide a way for analysts to build upon each other's work, where historically analysts typically engaged in separate efforts using separate hard drives.

To achieve a more efficient and productive workforce while we struggle at the manpower levels we are given, the cost community is coming together like never before to work towards the Cost Assessment Data Enterprise vision.

### **Tracking to Approved Estimate—Program/Budget Review and Acquisition**

The current acquisition process in the Department is event-driven and episodic in nature, and is driven primarily by the key milestones and other decision points identified in statute. However, CAPE is working with the military department cost agencies to strive for more continuous involvement of the cost analysis community in tracking program performance, updating cost and schedule estimates, and evaluating new program risks as they are identified. In particular, as part of the Department's program and budget review process, CAPE—in conjunction with USD(AT&L)—reviewed each acquisition program with significant funding changes from the latest baseline or prior year's President's Budget to determine the source of the cost estimate supporting the revised program and to ensure that the program remained fully funded. This process of tracking to the approved estimate will be even more important in the future, as the Department's acquisition programs face significant funding constraints, resulting in more reductions to program quantities and annual procurement rates, and more pressures to budget programs at less than full funding. Tracking to the approved estimate will be critical to ensure that MDAPs and MAIS programs remain funded to appropriate, defensible, and realistic cost estimates.

### **Cost Indices**

WSARA requires that CAPE periodically assess and update the cost indices used by the Department to ensure that such indices have a sound basis and meet the Department's needs for realistic cost estimation. The Under Secretary of Defense (Comptroller), or USD(C), provides the DoD military departments and Defense Agencies with guidance in the DoD Financial Management Regulation (FMR) on how to prepare budget estimates that comply with guidelines issued by the Office of Management and Budget (OMB); this guidance includes instructions on the use of USD(C)-provided deflators that are calculated from the OMB inflation forecast.

As noted in last year's report, CAPE commissions independent studies concerning cost indices to provide a factual and analytical basis for responding to this provision of WSARA. One study focused on the treatment of indices for the acquisition costs of

MDAPs. This study found that some DoD organizations—most notably the Naval Sea Systems Command (NAVSEA), Naval Air Systems Command (NAVAIR), and many Air Force program offices—have developed product-specific price escalation indices for use in their program cost estimates. These price indices include market price influences beyond just general inflation adjustments accounted for by the USD(C)/OMB deflators.

Consistent with this study, the current practice in the cost community is to permit the use of product-specific price indices when there is significant evidence that the product-specific price indices reflect the most likely cost trends. In such cases, the cost estimates are made in base-year dollars and escalated to then-year dollars using the product-specific indices. However, to establish a program baseline, the then-year dollars are returned to base-year dollars using the USD(C)/OMB inflation indices. Using this methodology, the final calculated program base-year dollar estimate will reflect the anticipated higher real price due to product-specific market influences beyond general inflation (or the change in the value of the dollar). Work in this area continued in 2013, and CAPE extended an earlier independent study. The follow-on study is now evaluating the best choices of product-specific indices by system commodity type, such as fighter aircraft.

### **Cost Analysis Education and Training**

CAPE is leading several initiatives to improve the education and training of the larger DoD civilian and military workforce in cost assessment, in accordance with the assigned responsibilities and goals of WSARA.

The Cost Leadership Forum mentioned earlier determined that the best way for dealing with the education and training issue would be to establish an advisory group consisting of representatives from CAPE and each of the military department cost agencies. Initially, the purpose of the training and education advisory group will be to provide stakeholder input to the certification standards and course curriculum associated with cost estimating for the Defense Acquisition University (DAU). However, the charter of this advisory group is not limited to DAU, and in the future will address other sources of training and education.

CAPE has supported the Navy, the Naval Postgraduate School, and the Air Force Institute of Technology in establishing an accredited Master's Degree Program in Cost Estimating and Analysis that began in April 2011. This two-year, distance-learning program is improving the education of the cost estimating community in both DoD and in the defense industrial base. The program is part-time and consists of two courses per quarter, for eight quarters. The program blends web-based, online instruction with video televised education, and is tailored to students whose careers will not allow them to participate in a full-time, traditional on-campus program. Tuition may be paid through the use of the Defense Acquisition Workforce Development Fund. The first cohort graduated in March 2013. The second cohort commenced in Spring 2012 and is scheduled to graduate in March 2014. The third cohort commenced in Spring 2013 and is scheduled to graduate in March 2015. The program has accepted applications for the fourth cohort, and the acceptance process began in November 2013.



## DoD Cost Analysis Symposium

For several decades, CAPE (and its predecessor organization) has sponsored an annual DoD Cost Analysis Symposium, known as DoDCAS, with attendees drawn primarily from government and private-sector cost research and analysis organizations. DoDCAS provides a valuable forum for the education, training, and improvement of communication within the DoD cost analysis community. The presentations made at DoDCAS facilitate discussion, instruction, and debate concerning cost estimating methods and models, data collection, and contemporary issues of interest to the DoD cost community. In this way, the event leverages the knowledge and experience of the community to increase individual and collective expertise in cost estimation and analysis. DoDCAS also provides members of the DoD cost community the opportunity to hear the insights of senior DoD and other government officials on important topics.

Unfortunately, the symposium event that had been planned for February 2013 was cancelled due to guidance from OMB and the Deputy Secretary of Defense to reduce expenditures for all conferences and travel. Also, a major concern is that the potential DoD and other government agency attendees would not have travel funding available to attend the event. CAPE is now examining options to reestablish a very limited version of the DoDCAS in FY 2014 and reestablish the full-scope of the symposium in future years.

## Summary

CAPE is continuing to develop and refine plans for the Department's cost estimating and cost analysis functions. Implementation of these plans will ensure that the cost assessment organizations, workforce, policies and procedures, data collection systems, and training and education programs will be strengthened and improved as necessary to meet the expanded roles and responsibilities established by WSARA. CAPE will continue to work with the Department's other cost and acquisition organizations to strengthen cost assessment so that better cost and schedule estimates are properly prepared and considered in the deliberations of all major acquisition programs. The progress and challenges for these initiatives will be reported in future editions of this report.

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## **Appendix A.**

### **Cost Analysis Organizations in DoD**

#### **Independent Cost Assessment Organizations**

There are four key offices for the preparation of ICEs. Within OSD, the office responsible for ICEs reports to the Director, CAPE. Within the military departments, these offices all report to their Assistant Secretary for Financial Management and Comptroller. The following paragraphs give a brief description and overview of these key offices responsible for ICEs.

##### **OSD – Deputy Director for Cost Assessment**

The CAPE Deputy Director for Cost Assessment prepares ICEs for all MDAPs and MAIS programs when acquisition oversight has not been delegated to a military department or Defense Agency, and reviews all cost estimates and cost analyses prepared by the military departments and Defense Agencies in connection with other MDAPs and MAIS programs. The Deputy Director for Cost Assessment provides leadership to the entire DoD cost community with regard to workforce development and management, policy and procedures, cost data collection, cost analysis education and training, and cost research.

##### **Army – Deputy Assistant Secretary of the Army for Cost and Economics**

The Deputy Assistant Secretary of the Army for Cost and Economics (DASA-CE) develops ICEs and Component cost analyses of Army weapon and information systems. DASA-CE conducts independent reviews and validation of business case analyses, economic analyses, and special cost studies of major weapon and information systems, force structure, and O&S costs. DASA-CE serves as the Cost and Economics advisor for Army Study Advisory Groups. It chairs and oversees the Army Cost Review Board, develops and approves the Army Cost Position for all major acquisition programs, and conducts in-depth risk analyses of major Army programs and associated costs.

##### **Navy – Naval Center for Cost Analysis**

The Naval Center for Cost Analysis (NCCA) advises the Secretary of the Navy, Chief of Naval Operations, and Commandant of the Marine Corps on cost and economic issues. NCCA leads the Department of the Navy cost community in issues of cost policy and policy implementation, with the goal of increasing the capability and efficiency of the Naval cost community. NCCA prepares independent cost analyses for Department of the Navy MDAPs and MAIS programs, and also conducts economic analyses and special studies to support relevant defense issues. NCCA coordinates all Department of the Navy cost research. The Executive Director of NCCA is the Deputy Assistant Secretary of the Navy (Cost and Economics).

## **Air Force – Deputy Assistant Secretary of the Air Force for Cost and Economics / Air Force Cost Analysis Agency**

The Air Force develops life-cycle cost ICEs and non-advocate Component cost analyses of Air Force aircraft, space, weapons, command and control, and automated information systems to support acquisition, programming, and budgeting decisions. The Air Force also conducts non-advocate business case analyses, economic analyses, and special cost studies of major systems, force structure, and O&S costs supporting multiple Air Force and DoD stakeholders. It maintains the Air Force Total Ownership Cost (AFTOC) database mandated by the Congress, and develop annual aircraft cost per flying hour estimates to support planning, programming, and budgeting decisions. The Deputy Assistant Secretary of the Air Force for Cost and Economics develops the Air Force Cost Position for all major acquisition programs; conducts and coordinates cost research to develop analytical databases, methods, and tools; and advocates for and manages the Air Force cost analysis workforce ranging from tactical to headquarters levels.

### **Additional Field-Level Cost Organizations and Activities**

There are several field-level cost organizations. These typically are located at a major product center such as the NAVAIR or the Air Force Life Cycle Management Center (AFLCMC). This section provides a summary of these important organizations.

#### **Army**

##### **TACOM Life Cycle Management Command (LCMC)**

The TACOM LCMC Cost and Systems Analysis organization is responsible for preparation of program office estimates, life cycle cost estimates, economic analyses, and combat effectiveness modeling that support the development of combat and tactical vehicles. It manages the tools and databases to support cost and systems analysis processes for the TACOM LCMC. The major cost analysis activities are life cycle cost estimating, cost reporting and EVM, O&S cost baselines, support to AoAs, source selection evaluations, and cost analyses associated with multi-year procurement contracts.

##### **Aviation and Missile Command (AMCOM)**

The AMCOM Cost Analysis Division provides cost estimation and analysis support to Aviation, Missiles and Space Program Executive Offices and their Program/Project Offices. It manages the AMCOM Cost Analysis Program and develops, updates, or obtains cost estimating relationships, cost factors, and mathematical and computerized cost models for estimating purposes. It develops cost estimates to support AoAs, tradeoff studies, and force structure cost estimates. It develops and prepares life cycle cost estimates, and it conducts other related studies in support of weapon system cost analyses. It performs cost risk analyses and cost risk assessments to support weapon system program decisions. It also provides validation/review for cost estimates, economic analyses, and business case analyses.

### **Communication-Electronics Command (CECOM)**

The CECOM Cost Analysis Division provides cost estimation and analysis support to CECOM Program Executive Offices and their Program/Project Offices. It provides several cost analysis services, including life cycle cost estimating, EVM, economic analysis, modeling and simulation, computer software and database support, and review and validation of business case analyses and other cost analyses.

## **Navy**

### **Naval Air Systems Command (NAVAIR)**

The Cost Department of NAVAIR provides a wide variety of cost analysis products and services. Its primary focus is to provide a clear and comprehensive understanding of life cycle cost and attendant uncertainties to be used in developing, acquiring, and supporting affordable naval aviation systems. Besides life cycle cost estimates, the Cost Department provides source selection cost evaluation support, EVM analysis, cost research and databases, and various cost/benefit studies.

### **Naval Sea Systems Command (NAVSEA)**

The Cost Engineering and Industrial Analysis Division of NAVSEA provides cost engineering and industrial base analysis for ships, ship-related combat systems, and weapons. It provides cost estimates in support of the DAB review process, including AoA studies. It also participates in contract proposal evaluations and the source selection process for builders and suppliers of ships and weapon systems, and it conducts analysis and forecasting of labor, industrial, and technical trends as they affect the overall acquisition of ships, combat systems, weapons, and other equipment.

### **Space and Naval Warfare Systems Command (SPAWAR)**

The Cost Estimating and Analysis Division (SPAWAR 01-6)—depending on a program's acquisition category—may provide assistance to ACAT I program offices, perform an ICE for ACAT II programs prior to a Milestone B or C review, or independently review a program office cost estimate upon the request of the Program Executive Officer (C4I and Space). SPAWAR 01-6 also provides more general cost analysis support to the Program Executive Officer (PEO) as needed.

### **Naval Surface Warfare Center**

The Cost and Affordability Group resides within the Warfare Analysis Branch of the Requirements Analysis and Advanced Concepts Division of the Warfare Systems Department at the Naval Surface Warfare Center, Dahlgren Division. The Group produces cost estimates, cost-risk assessments, and affordability analyses for Combat Systems. The Group also develops cost-estimating methodology in support of systems development and production, AoAs, and strategic planning. Particular areas of expertise include model development and maintenance, cost-research databases, technology assessments, life cycle cost estimates, budget and force-level analyses, performance-

based cost models, product-oriented cost models, proposal evaluation, and source selection reviews.

#### **Marine Corps Systems Command (MCSC)**

The Cost and Analysis Branch (C&AB) is the MCSC authority in the field of cost analysis. The C&AB conducts and oversees the development of cost estimates for MCSC weapon, IT, and non-standard training systems programs. The C&AB advises the Commander, MCSC and PEOs on the historic, current, and emerging trends in all elements of cost estimating and cost analysis. The Branch works for the MCSC Commander as an independent agent that provides cost products to Program Management Offices (PMOs) and PEOs. The Branch is organized into analytical teams in direct cost support of the PMOs and PEOs and a general support studies team for conducting AoAs and other operations research studies and analyses. Through its processes, the C&AB delivers life-cycle cost estimates to satisfy the “Will-Cost” estimate, whereas PMOs perform the “Should-Cost” analysis.

#### **Air Force**

##### **Air Force Life Cycle Management Center (AFLCMC)**

In 2012, the Air Force combined cost estimating activities from three product centers under AFLCMC (Aeronautical Systems Center, Electronic Systems Center, and Air Armament Center). AFLCMC leads estimates for program milestone decisions, manages the annual cost estimate process, supports pre-award activities and source selections, and participates in policy discussions resulting in high-quality cost estimates and analysis across the Center.

##### **Air Force Space Command, Space and Missile Center (SMC)**

The SMC Cost Estimating Division supports cost estimates and cost analyses associated with Air Force Space Command and the Space and Missile Center’s mission of satellite acquisition, launch, and control.

##### **Air Force Sustainment Center (AFSC)**

The AFSC Cost Estimating Division supports cost estimates and cost analyses associated with the Air Force Sustainment Center’s mission to provide depot maintenance, supply chain management and installation support to Air Force weapon systems.

##### **Air Force Nuclear Weapons Center (AFNWC)**

The AFNWC Cost Estimating Division supports cost estimates and cost analysis for all nuclear weapon systems activities. The responsibilities of the AFNWC include acquisition, modernization, and sustainment of nuclear system programs for both DoD and the Department of Energy.

## **Other**

### **National Reconnaissance Office (NRO) Cost Analysis Improvement Group**

The NRO Cost Analysis Improvement Group provides independent cost estimating support to the NRO. This support covers milestone decisions, budget submissions, EVM, ad hoc program support, data collection, methods development, and model/tool development.

### **Defense Information Systems Agency (DISA)**

The DISA Analysis and Internal Controls Division guides, directs, and strengthens cost analyses within DISA; and prepares cost estimates for the development, procurement, and sustainment of automated information systems and information technology capabilities. The Division provides independent support for DISA program/project costing efforts, and publishes DISA policies, practices and templates for cost estimation, cost/benefit analysis, and economic analysis.

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## Appendix B.

### Major Defense Acquisition Program Unit Cost Reporting

Since 1982, the Congress has required DoD to track and report on the unit cost for most MDAPs. The requirement for unit cost reporting may be waived if the program has not entered Engineering and Manufacturing Development (EMD), a reasonable cost estimate has not been established for the program, and the system configuration is not well defined. The provisions of the law concerning unit cost reporting, commonly referred to as the Nunn-McCurdy provisions, are found in section 2433 of title 10, *United States Code*. A complete description of the Department’s implementation of these provisions is provided in the *Defense Acquisition Guidebook* (<https://dag.dau.mil>): see section 10.9 (“Acquisition Program Baseline”) and section 10.10.1.5 (“Unit Cost Reports”).

There are two unit cost metrics subject to reporting, Program Acquisition Unit Cost (PAUC) and Average Procurement Unit Cost (APUC). PAUC is defined as the total program acquisition cost (sum of research, development, test, and evaluation; procurement; military construction; and acquisition-related O&M appropriations) divided by the total program quantity of fully configured end items from both the EMD and Production and Deployment Phases. APUC is defined as the program procurement cost divided by the procurement quantity. Both unit cost metrics are tracked in constant dollars of a base year established for each program.

The most current cost estimate for each unit cost metric is tracked relative to two baseline cost estimates. The current baseline estimate refers to the most recent baseline approved by the MDA. The original baseline estimate refers to the baseline approved at program initiation (usually Milestone B). A program is declared to have a unit cost breach when the current unit cost estimate exceeds either baseline unit cost estimate by more than certain specified percentages. Specifically, as shown in Table B-1, a unit cost breach takes place when any of the following criteria are met, for either version of program unit cost (APUC or PAUC):

**Table B-1. Unit Cost Breach Thresholds**

	<b>“Significant” Breach</b>	<b>“Critical” Breach</b>
Current Baseline Estimate	+15%	+25%
Original Baseline Estimate	+30%	+50%

Note that there are two degrees associated with the severity of the unit cost breach. For *significant* unit cost breaches, the Department notifies the Congress of the breach within 45 days of the unit cost report and subsequently submits a program SAR with additional, breach-related information. For *critical* unit cost breaches, in addition to notifying the Congress and submitting the SAR, the Department is required to conduct a complete assessment of the program, led by USD(AT&L), and determine if it should be terminated or continued. The Department is required to terminate the program unless a letter signed

by USD(AT&L), providing the certification that the program currently meets certain criteria established in law (section 2433a of title 10, *United States Code*), is submitted to the Congress within 60 days of the SAR submission. Among other things, USD(AT&L) must certify that the Director, CAPE has determined the new unit cost estimates are reasonable. A complete description of the critical unit cost breach certification process can be found in the *Defense Acquisition Guidebook*, section 10.10.1.5.2.2 (“Critical Cost Breach Certification Requirements”).

## Appendix C.

### Major Automated Information System Reporting

Public law (section 2445c of title 10, *United States Code*) requires annual and quarterly reports from MAIS programs, pre-MAIS (now referred to as unbaselined MAIS) programs, and any other investment in automated information system products or services that is expected to exceed the MAIS thresholds. Details about the MAIS reporting requirements may be found in the *Defense Acquisition Guidebook* (<https://dag.dau.mil>), section 10.11 (“Major Automated Information System Statutory Reporting”). Briefly, a MAIS Quarterly Report is used internally within the Department, and a MAIS Annual Report is provided to the congressional defense committees 45 days after submission of the President’s Budget. The formats of the quarterly report and annual report are similar. The reports provide a program description, a summary of the program status, and the latest estimates regarding schedule, performance characteristics, acquisition cost, and life-cycle cost.

The reports compare the latest estimates of schedule, performance, and costs relative to the program baseline approved at the previous acquisition milestone. This comparison is used to determine if the program has a deviation known as either a Significant Change or Critical Change. A Significant Change occurs when a program has a schedule delay of more than six months, but less than one year; there is a significant, adverse change in the expected performance of the system; or the estimated acquisition cost or life-cycle cost has increased by at least 15 percent but less than 25 percent. For a program with a Significant Change, the Department is required to notify the congressional defense committees of the change within 45 days after receiving the report that identified the deviation.

A Critical Change occurs when a program has a schedule delay of one year or more or fails to achieve a full deployment decision within five years of when funds for the program were first obligated;<sup>4</sup> there is a change in expected performance that will undermine the ability of the system to perform its intended functions; or the estimated acquisition cost or life-cycle cost has increased by 25 percent or more. For a program with a Critical Change, the Department must conduct an evaluation of the program, and then submit a report and a formal certification to the congressional defense committees within 60 days after receiving the report that identified the deviation; otherwise appropriated funds may not be obligated for any major contract under the program until the certification is submitted. The certification must affirm the following:

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<sup>4</sup> A recent legislative change (section 1092 of the *National Defense Authorization Act for Fiscal Year 2014*) allows for an exception to critical change reporting when the failure to achieve the full deployment decision within five years is due to an “extension of the program” (defined as further deployment or planned deployment to additional users not in the scope of the original program baseline), and the program is otherwise on track.

- (1) the program is essential to the national security or to the efficient management of DoD;
- (2) there is no alternative to the system or information technology investment which will provide equal or greater capability at less cost;
- (3) the new estimates of the costs, schedule, and performance parameters with respect to the program have been determined, with the concurrence of the Director, CAPE, to be reasonable; and
- (4) the management structure for the program is adequate to manage and control program costs.

## Appendix D.

### DoD Cost Data Collection Systems

Three primary data collection systems are used by DoD as the major sources of cost data for major acquisition programs:

- CSDR system – serves as the primary source of cost data for major contracts and subcontracts associated with MDAPs and MAIS programs
- EVM Central Repository – used to collect and archive EVM reporting documents
- VAMOS systems – collect historical O&S costs for major weapon systems

### Cost and Software Data Reporting System

#### System Description

The CSDR system is the primary means that DoD uses to collect actual cost and related data on major defense contracts and subcontracts. Defense contractors support the CSDR system, under contractual agreements, by reporting data on development, production, and sustainment costs incurred in executing contracts. The two principal components of the CSDR are contractor cost data reporting (CCDR) and software resources data reporting (SRDR).

CCDR is the primary means within DoD to systematically collect data on the development, production, and sustainment costs incurred by contractors. Interim DoD Instruction 5000.02, *Operation of the Defense Acquisition System*, establishes the CCDR requirements for major contracts and subcontracts (regardless of contract type) associated with MDAPs and MAIS programs.

The SRDR system collects software metrics data to supplement the CCDR cost data, to provide a better understanding and improved estimating of software-intensive programs. Interim DoD Instruction 5000.02 establishes SRDR requirements for major contracts and subcontracts (regardless of contract type) associated with MDAPs and MAIS programs. Data collected from applicable contracts include type and size of the software application(s), schedule, and labor resources needed for the software development.

Access to CSDR data is provided by the DCARC to authorized and approved users. Detailed procedures and other implementation guidance for both CSDR systems are found in DoD 5000.04-M-1, *Cost and Software Data Reporting (CSDR) Manual*. This manual (as well as downloadable report formats and definitions, specific report examples, and other related information) can be found at the DCARC website (<http://dcarc.cape.osd.mil>).

#### Cost and Software Data Reporting Compliance

The DCARC continually monitors each MDAP for compliance with CSDR requirements where applicable. CSDR reporting is not required when (1) the program is in pre-

Milestone A status, with no prototypes, or (2) the CSDR requirements have been waived by CAPE. Waivers for CSDR requirements may be granted when (1) a program is a procurement of a commercial system, or (2) a program is purchased under competitively awarded, firm fixed-price contracts, as long as competitive conditions continue to exist.

For the programs for which CSDR reporting is required and that are monitored for compliance, the compliance ratings established by the DCARC are based on the following five criteria:

- CSDR reporting plans have been submitted and approved.
- Approved reporting plans have been included in the appropriate request for proposal.
- Supporting contract data requirements (i.e., Contract Data Requirements Lists) for the various CSDR reports have been submitted.
- CSDR reports have been submitted on time consistently.
- CSDR reports have passed DCARC validation procedures consistently.

A program is rated fully compliant when all five criteria are met with no missing or incomplete items. A program is rated mostly compliant when all CSDR reporting requirements are placed on contract, but one or more criteria are not completely met. A program is rated not compliant when either (1) contracts were awarded that did not meet CSDR reporting requirements, or (2) any deficiency in meeting any of the five criteria has been open and unresolved for more than three months past the required due date.

For FY 2013, all of the 147 programs subject to CSDR reporting were fully or mostly compliant based on the criteria above. This is a slight improvement over the FY 2012 compliance statistics, in which 94 percent of the programs were considered compliant or mostly compliant. CAPE and the DCARC are continuing to emphasize the importance of CSDR reporting compliance for achieving more accurate program life-cycle cost estimates in the future.

### **Earned Value Management Central Repository**

In collaboration with the staff of USD(AT&L), the DCARC hosts the EVM Central Repository. The central repository supports the centralized reporting, collection, archiving, and distribution of key EVM data reports (such as Integrated Program Management Reports) for MDAPs and MAIS programs. Information about the central repository is available at the DCARC website, <http://dcarc.cape.osd.mil/EVM/EVMOverview.aspx>. More general information about EVM reporting is available in the *Defense Acquisition Guidebook* (<https://dag.dau.mil>), section 11.3.1 (“Earned Value Management”), and at the DoD Earned Value Management website, <http://www.acq.osd.mil/evm>.

The central repository supports complete, timely, and secure transfer of electronic data from the contractor to the repository; secure and controlled warehousing of the data; and controlled, timely, and secure access to the data by authorized users. The main purpose of

these data is to provide a consistent and timely situational awareness of acquisition execution.

Both the CCDR and the EVM reporting use a common, product-oriented taxonomy known as a WBS that follows the guidelines of the DoD Standard Practice, *Work Breakdown Structures for Defense Materiel Items* (MIL-STD-881C). The WBS is a hierarchy of product-oriented elements (hardware, deliverable software, data, and services) that collectively constitute the system to be developed or produced. Further information about the use of the WBS in cost reporting and cost estimating can be found in the *Defense Acquisition Guidebook*, section 3.7.1.1 (“Work Breakdown Structure”).

### **Visibility and Management of Operating and Support Costs Data System**

DoD requires that each military department maintain a system that collects historical data on the O&S costs for major fielded weapon systems. The CAPE Deputy Director for Cost Assessment provides policy guidance on this requirement, known as the VAMOSC program; specifies the common format in which the data are to be reported; and monitors its implementation by each of the military departments. The *National Defense Authorization Act for Fiscal Year 2012*, Public Law 112-81, contains a provision that calls for strengthened CAPE oversight of the VAMOSC program.

Each department has its own unique VAMOSC data system that tracks actual O&S cost experience for major weapon systems. The data can be displayed by time frame, at various levels of detail, and by functional elements of cost (such as depot maintenance, fuel, consumable items, and so forth). Each VAMOSC system provides not only cost data, but related non-cost data (such as system quantities and operating tempo) as well. VAMOSC data can be used to analyze trends in O&S cost experience for each major system, as well as to identify and assess major cost drivers. VAMOSC data systems are managed by each military department as follows:

- The Navy’s VAMOSC management information systems (known as Navy VAMOSC and Marine Corps VAMOSC) collect and report US Navy and US Marine Corps historical weapon system O&S costs. VAMOSC provides the direct O&S costs of weapon systems; some indirect costs (e.g., ship depot overhead); and related non-cost information such as flying hour metrics, steaming hours, age of aircraft, personnel counts for ships, etc. It is managed by the Naval Center for Cost Analysis.
- The Army’s VAMOSC system, called the Operating and Support Management Information System (OSMIS), tracks operating and support information for over 1,400 major Army weapon/materiel systems and is maintained by DASA-CE. OSMIS-tracked systems include combat vehicles, tactical vehicles, artillery systems, aircraft, electronic systems, and miscellaneous engineering systems. OSMIS provides cost data for these systems, as well as non-cost information such as aircraft flying hours or vehicle miles, fuel consumption, demand for parts, and number of end-item overhauls.

- The Air Force's VAMOS system, AFTOC, is managed by the Deputy Assistant Secretary of the Air Force for Cost and Economics. It provides O&S cost information on all Air Force aircraft, space systems, and missiles. The O&S cost information collected includes unit-level manpower, fuel, depot maintenance overhaul costs, depot-level reparable costs, and other costs of major US Air Force aircraft and engines. AFTOC also provides data on aircraft quantities and flying hours, numbers of personnel, and other non-cost information.



## Abbreviations

ACAT	Acquisition Category
ADM	Acquisition Decision Memorandum
AFLCMC	Air Force Life Cycle Management Center
AFNWC	Air Force Nuclear Weapons Center
AFSC	Air Force Sustainment Center
AFTOC	Air Force Total Ownership Cost
AHE	Advanced Hawkeye Aircraft
AMCOM	Aviation and Missile Command
AMDR	Air and Missile Defense Radar
AoA	Analysis of Alternatives
APUC	Average Procurement Unit Cost
AWACS	Airborne Warning and Control System
C&AB	Cost and Analysis Branch
CAC	Common Access Card
CADE	Cost Assessment Data Enterprise
CAPE	Cost Assessment and Program Evaluation
CARD	Cost Analysis Requirements Description
CCDR	Contractor Cost Data Reporting
CECOM	Communication-Electronics Command
CIO	Chief Information Officer
CSDR	Cost and Software Data Reporting
DAB	Defense Acquisition Board
DAES	Defense Acquisition Executive Summary
DASA-CE	Deputy Assistant Secretary of the Army for Cost and Economics
DAU	Defense Acquisition University
DAVE	Defense Acquisition Visibility Environment
DCARC	Defense Cost and Resource Center
DCMO	Deputy Chief Management Officer
DISA	Defense Information Systems Agency
DoD	Department of Defense
DoDCAS	Department of Defense Cost Analysis Symposium

EELV	Evolved Expendable Launch Vehicles
EHF	Extremely High Frequency
EMD	Engineering and Manufacturing Development
EVM	Earned Value Management
FCoM	Full Cost of Manpower
FMR	Financial Management Regulation
FY	Fiscal Year
FYDP	Future Years Defense Program
GCSS-MC	Global Combat Support System—Marine Corps
GPS	Global Positioning System
ICE	Independent Cost Estimate
LCM	Logistics Chain Management
LCMC	Life Cycle Management Command
LCS	Littoral Combat Ship
LEP	Life Extension Program
MAIS	Major Automated Information System
MCSC	Marine Corps Systems Command
MDA	Milestone Decision Authority
MDA	Missile Defense Agency
MDAP	Major Defense Acquisition Program
MM	Mission Modules
NAVAIR	Naval Air Systems Command
NAVSEA	Naval Sea Systems Command
NCCA	Naval Center for Cost Analysis
NGJ	Next Generation Jammer
NMT	Navy Multiband Terminal
NNSA	National Nuclear Security Administration
NRO	National Reconnaissance Office
NWC	Nuclear Weapons Council
O&M	Operations and Maintenance
O&S	Operating and Support
OCX	Next Generation Operational Control System

OMB	Office of Management and Budget
OSD	Office of the Secretary of Defense
OSMIS	Operating and Support Management Information System
PAUC	Program Acquisition Unit Cost
PEO	Program Executive Officer
PMO	Program Management Office
SAR	Selected Acquisition Report
SM-3	Standard Missile-3
SM-6	Standard Missile-6
SMC	Space and Missile Center
SPAWAR	Space and Naval Warfare Systems Command
SRDR	Software Resources Data Reporting
THAAD	Terminal High Altitude Area Defense
TKA	Tail Kit Assembly
USD(AT&L)	Under Secretary of Defense for Acquisition, Technology and Logistics
USD(C)	Under Secretary of Defense (Comptroller)
VAMOSOC	Visibility and Management of Operating and Support Costs
WBS	Work Breakdown Structure
WSARA	Weapon Systems Acquisition Reform Act

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