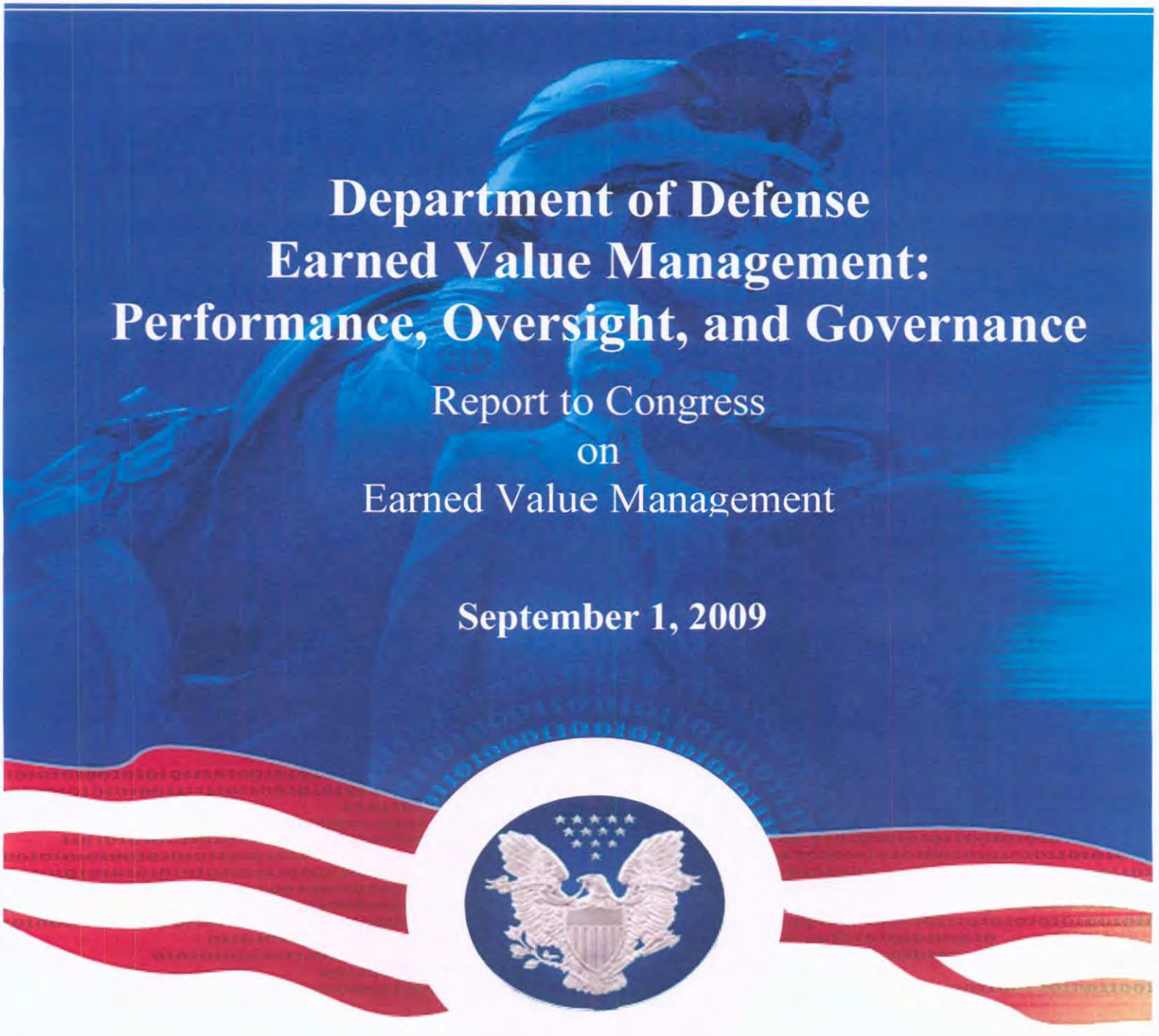

Department of Defense Earned Value Management: Performance, Oversight, and Governance

Report to Congress
on
Earned Value Management

September 1, 2009

Department of Defense
Office of the Deputy Under Secretary of Defense
Acquisition and Technology (A&T)

Department of Defense Earned Value Management: Performance, Oversight, and Governance

Report to Congress on
Earned Value Management

In Response to Section 887 of the Fiscal Year 2009
National Defense Authorization Act

Executive Summary

Why We Submitted This Report

Section 887 of the National Defense Authorization Act for Fiscal Year 2009 (FY 2009 NDAA), as amended by Section 302 of the Weapon System Acquisition Reform Act of 2009, directed the Department of Defense to report on the implementation of earned value management (EVM) and specified ten topics to include in the report. On January 24, 2009, the Under Secretary of Defense for Acquisition, Technology and Logistics, USD(AT&L), directed the creation of a Defense Support Team (DST) to systematically address those topics. This report presents the DST's recommended response: Section I contains EVM background information and describes the Department's EVM-related accomplishments, and Section II addresses the requirements of Section 887. The appendices contain additional material.

What Earned Value Management Accomplishments We Have Achieved

EVM is a program management tool that integrates the technical, cost, and schedule parameters of a contract. Office of Management and Budget Circular A-11, *Preparation, Submission, and Execution of the Budget*, requires executive agencies undertaking major acquisitions to use an Earned Value Management System. The Department has embraced EVM; it is invaluable as an assessment tool and as a means to hold all parties accountable for the effective management of large, complex acquisitions. The Department's commitment to EVM is evidenced by its many recent EVM-related accomplishments, such as the following:

- *Creation of EVM Centers of Excellence.* Each Military Department has established an EVM Center of Excellence to ensure the proper execution of Military Department operational responsibilities for EVM. In addition, in August 2004, the Intelligence Community (IC) established the IC EVM Council to enhance the level of EVM support that IC Agencies provide to their DoD and non-DoD customers, and the Defense Contract Management Agency established an EVM Center in 2007.

- *Provision of Policy Structure and Demonstration of Senior Leadership Commitment.* USD(AT&L) has issued regulations and memorandums defining the policy requirements for applying EVM to DoD contracts and demonstrating senior Department leadership commitment to EVM. (Several of these documents are in an appendix to this report, and they are available at http://www.acq.osd.mil/pm/.)

- *Engagement in EVM Forums to Continuously Grow.* DoD actively hosts and participates in several venues that develop and refine EVM policy and procedures and promote the efficient use of EVM. These organizations and venues include the DoD EVM Working Group, the DoD/Industry EVM Working Group, the Project Management Institute College of Performance Management, the Program Management Systems Committee of the National Defense Industrial Association, and forums sponsored by other federal agencies.

- *Development and Conduct of EVM Training.* The Defense Acquisition University offers a variety of EVM training, including formal certification courses, tailored training, and continuous learning modules.

Together, these accomplishments, and our commitment to continuous improvement, help the Department improve its EVM performance, oversight, and governance and thus promote the effective management of large, complex acquisitions. While these accomplishments represent significant commitments to improving EVM, the Department recognizes the need to continue to apply resources and attention to reach our objectives.

What Our Earned Value Management Analysis Demonstrates

After examining the topics identified in Section 887, the Department has concluded that the DoD EVM process is the best tool available to the program management community and senior leaders for effectively managing large, complex acquisitions. No other alternative exists that can match the benefits of EVM. Therefore, the Department is not pursuing any alternatives. Instead, it is focusing on improving EVM throughout the Department by implementing the DST's recommendations.

What Next Steps We Recommend

The DST will provide recommendations for actions to mature the Department's EVM capabilities and further leveraging the benefits of EVM. None of the recommendations requires congressional action. Many of the recommendations entail continuing to work on ongoing initiatives, while others entail undertaking some new initiatives or conducting further analyses. The DST has assigned responsibility for preparing Plans of Action and Milestones for implementation of the recommendations to the appropriate senior leaders. Once the recommendations are approved by USD(AT&L) for implementation, the assigned leader for each initiative will provide the DST and the USD(AT&L) with quarterly status updates and will identify any obstacles to success.

Shay D. Assad
Chairman, Defense Support Team on EVM
and Deputy Under Secretary of Defense
for Acquisition and Technology (Acting)

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A. Reporting Requirement

This report responds to the requirements of Section 887 of the National Defense Authorization Act for Fiscal Year 2009 (FY 2009 NDAA), as amended by Section 302 of the Weapon Systems Acquisition Reform Act of 2009. Section 887 states the following:

> "(a) IN GENERAL.—The Secretary of Defense shall prepare a report on the implementation by the Department of Defense of earned value management [EVM]. The report shall include, at a minimum, the following:
>
> (1) A discussion of the regulations and guidance of the Department applicable to the use and implementation of earned value management.
>
> (2) A discussion of the relative value of earned value management as a tool for program managers [PMs] and senior Department officials.
>
> (3) A discussion of specific challenges the Department faces in successfully using earned value management because of the nature of the culture, history, systems, and activities of the Department, particularly with regard to requirements and funding instability.
>
> (4) A discussion of the methodology of the Department for earned value management implementation, including data quality issues, training, and information technology systems used to integrate and transmit earned value management data.
>
> (5) An evaluation of the accuracy of the earned value management data provided by vendors to the Federal Government concerning acquisition categories [ACATs] I and II programs, with a discussion of the impact of this data on the ability of the Department to achieve program objectives.
>
> (6) A description of the criteria used by the Department to evaluate the success of earned value management in delivering program objectives, with illustrative data and examples covering not less than three years.
>
> (7) A discussion of the methodology used to establish appropriate baselines for earned value management at the award of a contract or commencement of a program, whichever is earlier.
>
> (8) A discussion of the manner in which the Department ensures that personnel responsible for administering and overseeing earned value management systems have the training and qualifications needed to perform that responsibility.
>
> (9) A discussion of mechanisms to ensure that contractors establish and use approved earned value management systems, including mechanisms such as the consideration of

the quality of contractor earned value management performance in past performance evaluations.

(10) Recommendations for improving earned value management and its implementation within the Department, including—

(A) a discussion of the merits of possible alternatives; and

(B) a plan for implementing any improvements the Secretary determines to be appropriate.

"(b) SUBMISSION OF REPORT.—Not later than October 14, 2009, the Secretary of Defense shall submit the report required by subsection (a) to the Committees on Armed Services of the Senate and of the House of Representatives.

"(c) DEFINITION.—In this section, the term ''earned value management'' has the meaning given that term in section 300 of part 7 of Office of Management and Budget Circular A-11 as published in June 2008."

B. Earned Value Management

EVM is a program management tool that integrates the technical, cost, and schedule parameters of a contract. During the planning phase of EVM, an integrated baseline, referred to as the Performance Measurement Baseline, is developed by time-phasing budget resources for defined work. Planning is one of the most important aspects of EVM. As work is performed and measured against the baseline plan, the corresponding budget value is "earned." From this earned-value metric, cost and schedule variances can be determined and analyzed. From these basic variance measurements, the PM can identify significant drivers, forecast cost and schedule performance, and construct corrective action plans to get the program back on track. EVM therefore encompasses both performance measurement (what is the program status) and performance management (what can we do about it).[1]

When properly implemented, EVM processes, systems, and reports provide many benefits:

- An integrated and disciplined management control system
- Insight into program performance
- Reduced management risk to meet program objectives
- Management by exception
- Accountability

[1] *Department of Defense Earned Value Management Implementation Guide*, October 2006.

- Comparative analysis against completed projects
- Objective information for managing the program.

C. Earned Value Management at the Department of Defense

Since 1999, the Department has recognized the 32 guidelines in the American National Standards Institute (ANSI)/Electronic Industries Alliance (EIA) Standard 748, Earned Value Management Systems (ANSI/EIA-748) for use on Defense programs. These guidelines have become, and continue to be, the universally accepted criteria against which industry and government evaluate and determine the capabilities and effectiveness of their Earned Value Management Systems (EVMS).

The Under Secretary of Defense for Acquisition, Technology and Logistics, USD(AT&L), has EVM policy responsibility. The Military Departments and Other Defense Agencies have EVM operational responsibility.

1. Office of the Secretary of Defense Responsibilities

As the Defense Acquisition Executive, USD(AT&L) is responsible for establishing and ensuring compliance with DoD EVM policy. This encompasses several responsibilities, including providing subject matter expertise, ensuring compliance with statutory and government-wide regulatory requirements, leading working groups, interfacing with external entities in both government and industry, determining training needs, managing data collection systems and analysis tools, and using contract performance information for decision making.

The following Office of the Secretary of Defense (OSD) organizations play a role in executing that policy responsibility:

- Deputy Under Secretary of Defense for Acquisition and Technology—is accountable for DoD EVM policy and governance.
- Director, Acquisition Resources and Analysis—is responsible for the data aspects of EVM and is the functional leader for the business career field.
- Defense Cost and Resource Center (DCARC)—was tasked by USD(AT&L) in an August 2006 memorandum and is currently responsible for maintaining the DoD EVM Central Repository (EVM CR).
- Director, System Engineering—provides system engineering expertise for EVM policy and guidance related to establishment of performance measurement baselines (scope, schedule, and resources) and technical performance measurement.
- Director, Defense Procurement and Acquisition Policy—Chairs the EVM DST; provides policy guidance on contractual implementation of EVM requirements; and provides an EVM Ombudsman to resolve differences in interpretation of EVM policy and practice, and represent DoD in resolving differences with other Federal agencies.

2. Defense Contract Management Agency and Intelligence Community Responsibilities

The Defense Contract Management Agency (DCMA) and the IC Agencies play a key role in executing the policy established by OSD.

DCMA is the Executive Agent for EVMS, with the primary responsibility for ensuring consistent application and interpretation of the EVMS guidelines and for reviewing contractor EVMS to verify their initial and ongoing compliance.[2] In 2007, DCMA established an EVM Center to oversee and advise DCMA and DoD management on the status of EVMS implementation and sustainment. In addition, the Center facilitates maximum use of EVM by industry and government. The Center has also worked to identify and resolve system and data integrity issues and to ensure efficient review processes. For example, the EVM Center worked to streamline the EVMS review method. The goal was to implement a standard review process to eliminate variations in approaches and guideline interpretations, reduce government review team size, minimize program disruption, and control review costs. The streamlined review method reduced the EVMS validation process from 36 months to 16 months.

In 2004, the IC established the IC EVM Council to enhance the level of EVM support provided by the Agencies to their DoD and non-DoD customers.

Contractors are responsible for developing and applying specific procedures for complying with the guidelines in ANSI/EIA-748. DCMA and the IC Agencies ensure that DoD contractors' EVMS comply with EVM criteria, validate their initial EVMS descriptions, and continuously oversee the compliance of their EVMS.

3. Military Department Responsibilities

Each Service Acquisition Executive (SAE)[3] reports to USD(AT&L) on acquisition management matters. In their capacity as senior procurement executives, SAEs are responsible for acquisition management direction for their respective Military Department. Each Military Department has established an EVM Center of Excellence (COE) at the SAE level to ensure the proper execution of its EVM operational responsibilities.

a. Army EVM Center of Excellence

The Army EVM COE has three tiers: (1) analysis, (2) core process, and (3) governance and direction. The foundational tier—analysis—is performed on all ACAT I, Major Automated Information System (MAIS), MDAP, and ACAT II programs. The COE staff conducts all

[2] USD(AT&L) memorandum, "Defense Contract Management Agency's Earned Value Management (EVM) Roles and Responsibilities," April 23, 2007, available online at the OSD EVM website: http://www.acq.osd.mil/pm/. DoD Components that are also part of the IC are excluded from delegating EVM authority to DCMA per USD(AT&L) memorandum, "Use of EVM in the Department of Defense," July 3, 2007.

[3] The SAE for the Army is the Assistant Secretary of the Army for Acquisition, Logistics and Technology, ASA(ALT). The Navy SAE is the Assistant Secretary of the Navy for Research, Development and Acquisition, ASN(RDA). The Air Force SAE is the Assistant Secretary of the Air Force for Acquisition, SAF(AQ).

analyses; PM/Program Executive Officer (PEO) coordination is through the Department of the Army Systems Coordinator. The second tier—core process—has six areas: (1) policy and governance, (2) training, (3) reviews and scheduling, (4) analytics, (5) business systems, and (6) strategic communications. Each core process is led by a COE staff member. In addition, the COE staff plans to convene an Integrated Product Team (IPT), consisting of field and staff subject matter experts to solve specific issues related to EVM. The third tier—governance and direction—has two layers: COE Board of Directors, and headquarters and OSD staff.

EVM within the Army is an evolving process. The Army is undergoing a three-phased approach to assess, develop, and implement an effective EVM solution:

- Phase I: Internal Assessment
  - Review contracts
  - Assess EVM oversight within the Army
- Phase II: Results Analysis and Course of Action Development
  - Assess the Army EVM implementation
  - Assess/improve the predictive metrics established by the Assistant Secretary of the Army for Acquisition, Logistics and Technology
- Phase III: Implementation and Sustainment
  - Revise scope and level of oversight
  - Identify an information technology solution.

The Army EVM COE continues to assess existing capabilities (both manpower and technology) to fully integrate EVM into its decision-making and oversight processes. The Army also is reviewing the collection of data at the contractor level and reporting through the following systems:

- Army Probability of Success
- Army Universal Acquisition Data Display and Entry
- Defense Acquisition Management Information Retrieval (DAMIR)
- DoD EVM CR.

The Army is identifying data discrepancies and reporting errors and instituting corrective actions.

Visibility of EVM data is fully integrated into the monthly review of ACAT I programs at the Military Department level. Both subjective and objective data are incorporated in the Army's

review process to depict and assess the current state of program execution, identify problem areas, and develop an action plan for program success.

b. Navy Center for EVM

The Navy Center for Earned Value Management (CEVM) is the Navy's central point of contact and support office for all matters concerning EVM and EVM implementation on Navy and Marine Corps acquisition programs. Established in April 2007, the CEVM represents the Navy's EVM position at the OSD level and with industry organizations, while providing program support for contract requirements, Integrated Baseline Review (IBR) training and support, and other EVM assistance when requested. The CEVM has four divisions: (1) IBRs/management system assessments, (2) scheduling, (3) analysis, and (4) training. The CEVM staff consists of five full-time government positions: a director and four division heads. The CEVM is supported by contractor personnel.

To date, the CEVM has accomplished the following:

- During September 2007, the CEVM created a website where users can download Navy EVM tools, EVM policy guidance, and other EVM reference materials. The website also contains instructions that guide users through a "real-life" scenario of applying the EVM tools. The CEVM website is also the central location for the latest information on EVM acquisition guidance and any updates to DoD and Navy EVM acquisition policy.

- Since January 2008, the CEVM, under the guidance of the DCMA EVM Center and in conjunction with the Supervisor of Shipbuilding, participated in three EVMS validation reviews—IBRs/management system assessments for the Extended-Range Guided Munition, Navy Enterprise Resource Planning, and DDG-1000—and participated in 16 EVMS surveillance reviews.

- In February 2008, the Navy established an EVM Stakeholder Group, which comprises representatives from the Systems Commands, Naval Electronics Liaison Office, Marine Corps, and CEVM. The Navy charged the Stakeholder Group with strengthening EVM implementation and facilitating communication in the Navy and Marine Corps acquisition community. The EVM Stakeholder Group is developing an EVM Analysis Tool Kit, an EVM Contract Requirements Tool Kit, and a potential Quick-Look Report to assist with reporting contract execution status during gate and portfolio reviews.

c. Air Force EVM Center of Expertise

The Air Force has established EVM subject matter expertise at the headquarters level for administration, oversight, and policy application. The Deputy Assistant Secretary for Acquisition Integration, Program Integration Division (SAF/AQXR) maintains the subject matter expertise for the Air Staff and participates in various government and industry forums designed to maintain currency on EVM applications as they apply to program management. In addition, each product center has EVM focal points with subject matter expertise on policy interpretation, implementation, compliance, oversight, and application.

The Air Force coordinates and communicates between headquarters and its product center focal points through the Air Force EVM IPT, which develops and implements Air Force EVM policy and provides a forum to resolve EVM issues. Members of the Air Force EVM IPT include the Deputy Assistant Secretary of the Air Force for Acquisition Integration (SAF/AQX), Deputy Assistant Secretary of the Air Force for Cost and Economics (SAF/FMC), Major Commands (Air Force Material Command and Air Force Space Command), Product Centers (Air Armament Center, Aeronautical Systems Center, Electronic Systems Center, and Space and Missile Systems Center), Air Logistics Centers, Air Force Research Laboratory, and Air Force Nuclear Weapons Center. SAF/AQXR also runs a Community of Practice, providing a "virtual" environment to electronically share lessons learned across the Air Force as well as a place to store and maintain current policy.

Finally, the Air Force uses a system called the System Metric and Reporting Tool to report on its acquisition programs. This report is produced monthly by each program and reviewed by senior Air Force leaders. These monthly acquisition reports include EVM information specific to each cost-based contract held by each program.

The following are two specific EVM accomplishments of the Air Force:

- The Air Force EVM IPT identified gaps in EVM training (program management, scheduling, contracting). To fill those gaps, the IPT is capitalizing on best practices at the Defense Acquisition University (DAU) and Air Force Institute of Technology and is leveraging the organic training being used by the Product Centers and Deputy Assistant Secretary for Acquisition Integration (SAF/AQX) as standardized training modules. This approach has three key benefits: (1) standardized training, which ensures a common level of competence among PMs; (2) interchangeable courses and instructors; and (3) synergism and economy of resources. In January 2009, SAF/AQX approved this concept and gave authorization to proceed. This initiative has since received positive support throughout the Air Force.

- Upon SAF/AQXR's request, the Air Force Audit Agency completed a review, in April 2008, of the use of EVM throughout the Air Force at its four Product Centers and recommended the following actions: improve detailed analysis using the Earned Value Management Implementation Guide, and develop EVM training plans for program office personnel. As a result, SAF/AQXR expanded the EVM section in the Air Force's acquisition policy document, Air Force Instruction 63-101, published April 17, 2009, to specifically address those concerns.

4. Implementation and Oversight Responsibilities

The implementation and oversight of EVM is a shared responsibility; both the government and industry must evidence a commitment to this management tool by fulfilling their respective roles. The July 3, 2007, USD(AT&L) memorandum, "Use of Earned Value Management in the Department of Defense," defines DoD's roles and responsibilities. In addition, contractors are expected to assume the responsibility for their own behavior and to follow DoD regulations and internal policies and procedures, especially with regard to consistent application of the EVMS and its currency and relevance.

The key DoD EVM oversight roles and responsibilities are summarized below:

- The Program Manager (PM) is responsible for delivering the project with the correct technical specifications, within the agreed schedule, and within the approved budget. The PM is accountable for the project and has the necessary authority to undertake that responsibility. The PM is responsible for the overall management and execution of the program. The PM's supporting acquisition team assists with budget execution, contract management, logistics preparations, and ensuring that the functions described in Defense Federal Acquisition Regulation Supplement (DFARS) 242.302 are completed by the contractor in accordance with the terms and conditions of the contract.

- The PEO has the overall responsibility for managing projects and developing and leading a strategically oriented PMO, with the objective of prioritizing and optimizing the resulting value from the program.

- DCMA, per the requirements of DFARS 242.302, is responsible for formally validating whether contractor EVMS are compliant with the guidelines in ANSI/EIA-748. Specifically, DCMA is the cognizant office responsible for ensuring that contractors complete the functions described in DFARS 242.302 in accordance with the terms and conditions of their contracts. When a contractor fails to maintain a DCMA-approved EVMS, DCMA may withdraw or suspend its approval. DCMA is responsible for informing the government PM and the Component focal point of either EVMS deficiencies or program implementation problems; however, when administration duties are retained by the procuring contracting office, they will provide the notification.

- The IC Agencies are exempted from the requirement to delegate EVMS authority to DCMA. Instead, they are responsible for ensuring the compliance of contractor EVMS with ANSI/EIA-748 on their contracts. The IC Agencies are the cognizant offices responsible for ensuring that contractors perform the functions described in DFARS 242.202 in accordance with the terms and conditions of IC Agency contracts. When a contractor fails to maintain an EVMS, the IC Agency may withdraw or suspend approval of the system. The IC Agencies are responsible for informing the government PM and the Component focal point of either EVMS deficiencies or program implementation problems.

- The Defense Contract Audit Agency is responsible for supporting surveillance activities to ensure compliance with DoD EVM policy and guidance.

The system of checks and balances is an important part of EVM at DoD. With checks and balances, the stakeholders hold each other accountable for performing their respective responsibilities. As a result, no single stakeholder becomes too powerful or lethargic. Each stakeholder "checks" the performance of the others to ensure the effective and efficient operation of the EVM process.

5. Department of Defense EVM Initiatives

Two major DoD regulatory documents guide the management of defense acquisition: DoD Directive 5000.01, "Defense Acquisition System," and DoD Instruction (DoDI) 5000.02, "Operation of the Defense Acquisition System."[4] DoDI 5000.02 establishes a management framework for translating mission needs and technological opportunities into stable, affordable, and well-managed acquisition programs.[5] It also contains EVM policy. The Defense Acquisition Guidebook and the Earned Value Management Implementation Guide provide guidance to supplement the EVM policy in DoDI 5000.02. In addition to these DoD publications, many other documents, listed below, help frame the EVM environment.

a. Policy

The policy requirements for applying EVM to DoD contracts are well documented through USD(AT&L) regulations and memorandums.[6] These policy issuances demonstrate the commitment of senior Department leaders to EVM. The following are recent policy issuances:

- USD(AT&L) memorandum, "Standardization of Work Breakdown Structures to Support Acquisition Program Management" (January 2009), which iterates the importance of the work breakdown structure (WBS) in communicating information about program requirements and program performance, the need for standard data groupings, and the importance of using a standard WBS. The memorandum announces the Department's intent to publish a WBS Standard to address challenges arising from the current nonstandard approach.

- Director, Defense Procurement and Acquisition Policy (DPAP) memorandum, "Earned Value Management Requirements and Reporting" (August 2008), which emphasizes the roles of the PM and contracting officer in ensuring that EVM requirements are appropriately identified and incorporated into solicitations and contracts, and that they are executed properly. The memorandum announces the Department's publication of the EVM Contract Requirements Checklist to assist PMs and contracting officers.

- Director, DPAP final rule (April 2008), which amends the DFARS to update requirements for DoD contractors to establish and maintain EVMS. The rule added DFARS Subpart 234.2 on EVM policy requirements and DFARS 252.234-7001 and 252.234-7002 EVMS clauses.

- USD(AT&L) memorandum, "Implementation of the Central Repository System" (July 2007), which directs full implementation of the EVMCR on all ACAT I programs. Under the pilot program, contractors directly submitted their Contract Performance Reports into a central database. The database is available to program offices and DoD acquisition leaders based on a set of business rules. This greatly increased the availability, timeliness,

[4] These DoD publications are available online at http://www.dtic.mil/whs/directives/.

[5] *Introduction to Defense Acquisition Management* (Fort Belvoir, VA: Defense Acquisition University Press, December 2008).

[6] These USD(AT&L) publications are available online at the OSD EVM website: http://www.acq.osd.mil/pm/.

and level of detail (level 3 versus level 1) of EVM data for OSD analysts and decision makers. The memorandum announces the Department's intent to fully implement the EVMCR to achieve these benefits across the Department.

- USD(AT&L) memorandum, "Use of Earned Value Management (EVM) in the Department of Defense" (July 2007), which emphasizes the need to improve EVM implementation, challenges leaders to emphasize EVM use, and delineates authority and accountability for monitoring EVM use. The memorandum defines the EVM roles and responsibilities of USD(AT&L), DCMA, Defense Contract Audit Agency, DoD Components/procuring activities, and DoD IC Agencies.

- USD(AT&L) memorandum, "Defense Contract Management Agency's Earned Value Management (EVM) Roles and Responsibilities" (April 2007), which recognizes and supports DCMA's EVMS role, announces the intent to formalize DCMA as the designated EVMS Executive Agent, and states the responsibility of DoD Components for effective EVM implementation.

Appendix A contains copies of these policy issuances.

In addition to these overarching DoD policies, regulations, and memoranda, each of the Service Acquisition Executives, through their cognizant acquisition management organizations, have promulgated implementing procedures, guidance, and instructions for their respective Military Departments. Section II discusses our review of these EVM regulations and guidance.

To foster awareness and compliance, the Department participates in several outreach activities and offers training, as discussed below.

b. Outreach

DoD actively hosts and participates in several organizations and venues that develop EVM policy and procedures and promote the efficient use of EVM. Among those organizations are the DoD EVM Working Group, DoD/Industry EVM Working Group, Project Management Institute College of Performance Management, National Defense Industrial Association (NDIA) Program Management Systems Committee, and forums sponsored by other Federal agencies. DoD representatives also contribute to promulgating the EVM message to other organizations such as the National Contract Management Association. In addition, DoD maintains an EVM Contract Requirements Checklist[7] for use in implementing EVM on contracts by all interested parties in DoD and industry.

The Director, Acquisition Resources and Analysis established the DoD/Industry EVM Working Group in 2003 to provide a working-level forum for assessing EVM and broader program management issues and concerns and for sharing improvement ideas, recommending solutions, and capitalizing on existing industry practices. Membership includes representatives from OSD, the Military Departments, Defense Agencies, NDIA, and large Defense contractors. The working

[7] Available at http://www.acq.osd.mil/pm/documents/EVM_Contract_Req_Checklist_apr08.doc.

group addresses overarching DoD and industry issues in the following areas: policy, validation, and surveillance; contract requirements; training; contract definitions; management acceptance; process integrity; and subcontractor management. The working group has been divided into subgroups to focus on specific issues, including data integrity, reciprocity of EVMS validations between DCMA and the IC, and DoD EVM policy updates.

c. Training

DAU offers a variety of EVM training, including formal certification courses, tailored training, and continuous learning modules. Below are some examples:

- BCF 102, Fundamentals of Earned Value Management
- BCF 203, Intermediate Earned Value Management
- BCF 262, EVMS Validation and Surveillance
- BCF 263, Principles of Schedule Management
- CLB 016, Introduction to Earned Value Management
- CLB 017, Performance Measurement Baseline
- CLB 018, Earned Value and Financial Management Reports
- CLB 019, Estimate at Completion
- CLB 020, Baseline Maintenance.

DAU provides this training using various formats, including resident classroom and online courses through formal lectures, simulations, and case studies. DAU also provides "action learning" in the form of program start-up workshops, which attempt to foster—within the program team—an understanding of several facets of program execution, including the use of EVM. In addition, DAU maintains an active online community of practice[8] that provides a venue for practitioners and the extended acquisition community to share policy information and best practices and to engage in threaded discussions about training and other EVM-related topics of interest.

D. Systematic Evaluation of Earned Value Management at the Department of Defense

Despite having a strong policy baseline—and using outreach and training to foster awareness and compliance—DoD recognizes the need for continuous improvement in order to successfully implement EVM on Defense programs. Although the Department has made significant progress, much remains to be accomplished in ensuring full compliance with the tenets of EVM and thus

[8] See the EVM Community of Practice website: https://acc.dau.mil/evm.

achieving EVM's full benefits. The Department remains committed to the continued pursuit of improvements and resolution of any challenges.

To that end, on January 24, 2009, USD(AT&L) established a Defense Support Team (DST) to systematically address the implementation of EVM in the Department. DSTs are made up of world-class technical experts to address the Department's toughest program technical issues. USD(AT&L) uses such teams to resolve emergent problems and to help the Department successfully execute tough programs before problems develop. Appendix B contains the USD(AT&L) memorandum establishing the EVM DST and the EVM DST charter.

The Director, Defense Procurement and Acquisition Policy is the acting Deputy Under Secretary of Defense for Acquisition and Technology, DUSD(A&T), and Chairman of the DST, which includes senior-level representatives from USD(AT&L), the Military Departments, and the Defense Agencies. The DST provided recommendations and will oversee their implementation as directed by USD(AT&L).

To ensure timely and effective completion of the DST recommendations, the Department has assigned responsibility for each initiative to a senior leader in the Department. Going forward, the assigned leaders for each initiative will provide the DST and the USD(AT&L) with quarterly status updates, including identification of any obstacles to success.

Section II. Analysis: Implementation of Earned Value Management at the Department of Defense

This section provides detail on DoD's analysis methods and findings regarding each of the requirements in Section 887 of the FY 2009 NDAA, as amended by Section 302 of the Weapon Systems Acquisition Reform Act of 2009.

A. Requirement 1, EVM Regulations and Guidance

Section 887 (a) requires "a discussion of the regulations and guidance of the Department applicable to the use and implementation of earned value management."

1. Method

The DST began its work by identifying and confirming the inventory of DoD EVM regulations and guidance. Each Military Department and Defense Agency continued this task by identifying its component policies and regulations, and those of its subordinate commands and offices. The DST then determined the consistency of EVM regulations and guidance by comparing each Department-level document with other regulations and guidance, and with those of DCMA. Each Military Department/Agency reviewed its own regulations and guidance, while DCMA reviewed both its own documents and those of the other Military Departments/Agencies.

2. Findings

The DST found few inconsistencies among DoD's EVM policies, regulations, and guidance. At the most general level, the DFARS mandates EVM reporting on all cost- and incentive-type contracts valued at or over $20 million. Common Data Item Descriptions ensure a degree of consistency in EVM data reporting in the contracts of all Military Departments and Defense Agencies. Each of the Departments and Agencies prescribes policies and procedures for oversight of its contracts and its use of EVM data and metrics. Of particular note, DCMA publishes many handbooks and procedural guidance associated with its unique roles in validating contractors' EVMS and monitoring contractors' compliance with their approved systems.

Although the DST found few inconsistencies, it agreed on the need to revise some existing documents and to create certain new documents and standard processes. The main need is to update dollar thresholds for application of EVM requirements in some Component documents to match the thresholds in the DFARS, which was updated in April 2008. The DST assigned these document updates to the relevant Military Department/Agency.

B. Requirement 2, Relative Value of EVM for PMs and Senior Officials

Section 887 (a) (2) requires "a discussion of the relative value of earned value management as a tool for PMs and senior Department officials."

1. Method

The DST empanelled a group of individuals with program management and EVM expertise. They included representatives from the Military Departments, Agencies, and OSD. The DST's broad and deep experience managing programs that use EVM enabled collaborative development of the findings. Relying on their professional judgment and experience, this team of experts first defined EVM attributes from a theoretical perspective. Next, it identified the benefits that potentially accrue from such attributes. Finally, it considered challenges that may limit the actual achievement of those benefits.

2. Findings

The consensus of the panel is that the DoD EVM process provides the best option available to the program management community and senior leaders for planning, monitoring, and holding all parties accountable for the effective management of large and complex acquisitions.

a. EVM Attributes

EVM is a program management tool that integrates the technical, cost, and schedule parameters of a contract. At its best, EVM can provide early warning to managers of cost and schedule trends and can forecast probable future cost and schedule impacts. During the planning phase, an integrated baseline is developed by creating a time-phased budget for defined work. As work is performed and measured against the baseline, the corresponding budget value is "earned." EVM encompasses performance measurement (i.e., what is the program status) and enables performance management (i.e., what can we do about it). EVM provides significant benefits to both the government and the contractor as a disciplined approach to planning, execution, and assessment of progress on major projects through the use of an integrated system to plan and control authorized work. While the application of EVM alone is not sufficient to achieve cost, schedule, and performance objectives, DoD endorses EVM for its widely recognized attributes:

- It provides a robust framework for managers to plan, execute, measure, analyze, and adjust work as a contract progresses.
- It integrates cost, schedule, and technical planning and performance information.
- It provides for periodic reports that allow the display of trends, and the data to support the development of updated estimates at completion.
- It provides early warning indicators to support management action.
- It provides cost and schedule variance analyses that allow for further investigation of root causes and possible solutions.

- It provides schedule indices that compare planned and accomplished work and alert the PM to actual or potential schedule problems within an integrated master schedule.
- It provides information that is useful to decision-makers, from PMs to senior Department managers and executives, as the basis on which to analyze and determine actual costs, predict funding requirements by fiscal year, and set budgetary requirements.

The fidelity of EVM data is critical to providing an objective assessment of a program's performance from which PMs can make well-informed decisions. Moreover, EVM is an integrated assessment method designed to assist PMs and their teams with more effectively managing their programs; to help senior officials administer portfolios; and to help the enterprise as a whole establish cost realism in independent cost estimates, provide a comparative foundation in proposal evaluation, track execution, and adjust current-year funding.

b. EVM Challenges

EVM by itself is not a panacea. Some of the limitations in EVM arise from its susceptibility to programmatic influences that may be largely beyond the PM's span of control, which can prevent perfect execution of cost and schedule to the plan. The following are among these influences:

- Funding instability
- Unrealistic cost estimates
- Inadequately stated or unstable requirements
- Overly aggressive delivery schedules
- Fact-of-life technical changes to improve effectiveness, survivability, or supportability
- Establishment of an unrealistic Performance Measurement Baseline (PMB), as where the government accepts "buy-in" pricing as the PMB or where much of the work appears as "level of effort" in the PMB
- Poor, or poorly executed, acquisition strategy (e.g., inappropriate contract type, late delivery of government-furnished material, etc.)
- Changes in material costs not yet covered by firm purchase orders.

It may not, however, identify the cause of trends or provide complete solutions to rectify issues if these influences are left unchecked. When this happens, the EVM process provides little aid to the PM in deciding on a course of corrective action to address performance variances. However, EVM provides a useful measure of effort remaining and expected utilization rate to scope the PM's options.

To maximize its effectiveness, EVM must be integrated with other management tools. Examples of tools under the umbrella of acquisition management are program management, procurement

or contract management, risk management, cost management, change control management, configuration management, engineering management, quality management, and logistics management.

c. EVM Benefits

When properly implemented, the established EVM processes, systems, and reports yield the full benefits outlined below.

i. Benefit: EVM Provides an Integrated Method for Planning, Budgeting, Program Management, and Control

The disciplined criteria for developing an EVMS promote the integration of cost, schedule, and technical processes with risk management, improving the efficiency and effectiveness of program management. EVM implementation requires planning, measuring progress, accumulating actual costs, analyzing variances, forecasting costs at completion, and incorporating changes in a timely manner.

Implemented and maintained correctly, EVM provides a planning, budgeting, management, and control system that enables both the government and industry to manage and report from a common PMB.

Establishment of a PMB requires a work breakdown structure (WBS), wherein a program is broken down into detailed tasks that clearly define measurable work and technical progress along with an integrated and resourced plan, cost, and schedule. The WBS identifies how each task fits into the overall program plan, establishes accountability for each task, and can, by giving personnel a sense of ownership, result in a more realistic estimate of the scope of each task.

ii. Benefit: EVM Improves Insight into Program Performance

Enhanced insight into program performance results from a continuous and rigorous planning process, description of detailed work by tasks, integrated scheduling, and control. By employing EVM with the supporting disciplined practices, programs can quickly identify and mitigate risks or resolve issues before they spiral out of control.

To further obtain the benefits of EVM best practices in increasing insight to planning and executing contracts, DoD institutionalized the use of the IBR process.[1] An IBR is a joint assessment conducted by the government PM and the contractor to verify the realism and accuracy of the PMB. This involves verifying the technical content of the baseline and assessing the realism and accuracy of the related resources (performance budget and IMS). The IBR assesses the risk associated with the baseline plan for performance measurement and helps ensure complete coverage of the statement of work, logical scheduling of the work activities, adequate resourcing, and identification of inherent risks. As a precursor to the IBR process, the program team performs a Schedule Risk Assessment to predict the level of confidence in

[1] See 48 CFR 252.234-7002, Earned Value Management System.

meeting program milestones.[2] The IBR, coupled with the risk analysis, assesses the achievability of the PMB and provides managers with early-warning indicators of program risks and opportunities.

iii. Benefit: EVM Reduces Management Risk to Meet Program Objectives

EVM practices are intended to apply methodical discipline and objective measurement and analysis to cost, schedule, and technical processes. This rigorous planning, and continuous analysis of new EVM data, provides the information needed to identify and address problems as they arise and prevent them from resurfacing. Early mitigation of cost, schedule, and technical problems improves the probability of achieving program budget and completion goals.

iv. Benefit: EVM Promotes Management by Exception

EVM focuses management attention on the most critical program performance measures, whether critical path tasks/activities or tasks for which cost or schedule results are deviating from the PMB, thereby reducing information overload. Because EVM allows prompt communication of cost and schedule variances relative to the baseline, managers can focus on the most pressing problems first.

The Department's implementation of the DCMA EVM tripwire format has proven to be a useful mechanism that provides PMs and senior leaders with a proactive view of program performance. Distributing data in a standard format has had distinct advantages. First, a standard format has ensured that the Department can access and easily combine and compare data from different Military Departments, facilitating cross-disciplinary collaboration in the implementation of EVM. Also, by using one standard format, the Department has been able to focus on and consistently address the most pressing performance issues.

v. Benefit: EVM Fosters Accountability

A program team that has visibility into program performance can better understand the implications of how the performance of each task affects overall program success. Managers held accountable for their actual performance compared to their plans are more likely to implement a disciplined process for estimating work and tracking it through completion.

EVM requires a WBS, which decomposes a program into sufficiently detailed tasks to clearly define measurable work, along with an integrated and resourced plan, cost, and schedule to establish a PMB indicating when tasks are to be completed and at what cost. This enables those responsible for implementing specific tasks to better understand how their work fits into the overall program plan, establishes accountability, gives personnel a sense of ownership, and can result in more realistic estimates at completion of future tasks.

[2] The requirement for a Schedule Risk Assessment is in Data Item Description DI-MGMT-81650, Integrated Master Schedule (IMS)

vi. Benefit: EVM Provides Objective Information for Managing the Program

Measuring program performance gives objective information for identifying and managing risk; it allows early detection and resolution of problems by anticipating cost, schedule, and technical risks based on program trends. EVM provides the basis for periodic updates of estimates at completion of the work, so that managers at all levels have information about the likely outcomes of, and resources required to complete, ongoing work. Objective data obtained from an EVMS enable management to defend and justify decisions and take action.

vii. Benefit: EVM Allows Comparative Analysis against Completed Projects

By adhering to the established EVM processes, consistent and reliable reporting of program data enables the establishment and maintenance of a historical database for comparative analysis of data compiled from similar programs. In the interest of providing a common database for use by the acquisition community, DoD has established and is populating the DoD EVM Central Repository (EVM CR) for ACAT I management data. (Data quality and information technology are addressed further in the discussion of requirement 4.) Senior leaders can also use historical data for planning programs, improving the cost estimating process, and identifying the contractors that most often complete contracts on schedule and close to their initial PMB cost estimates.

C. Requirement 3, Challenges

Section 887 (a) (3) requires "a discussion of specific challenges the Department faces in successfully using earned value management because of the nature of the culture, history, systems, and activities of the Department, particularly with regard to requirements and funding instability."

1. Method

The DST assembled a group of Department subject matter experts to identify the specific challenges facing the Department's implementation of EVM, including the identification of the criteria used to evaluate the success of EVM for delivering program objectives. The DST specifically evaluated how the Department's EVM process is implemented, ascertained how effectively it is implemented, and assessed how its successful execution is measured.

2. Findings

The Department has made marked progress in alleviating the obstacles hindering the complete implementation of EVM, but three main categories of challenges to EVM implementation remain: cultural, perceptual, and operational.

a. Cultural Challenges

DoD faces numerous cultural challenges in successfully using EVM to manage Defense programs. Currently, the level of acceptance and use of EVM in program management is

considered by many in the Department to be insufficient, especially given the number of programs experiencing execution problems.

To reverse this trend, cultural changes are necessary at all levels of DoD in order to maximize EVM's benefits. To maximize EVM benefits within the Department, senior leaders must institutionalize strong and visible support for EVM as a program management tool. There must be an understanding of how to use EVM as a management tool rather than, for instance, a monthly report. Simply stated, EVM furnishes Department decision makers with the information necessary to answer two questions:

1. When will products/services be delivered? Often, the answer to this question is "later than planned."

2. How much will they cost? The answer is often "more than expected."

Since properly executed EVM yields data that enables answers to these questions, it is imperative to overcome the cultural challenges of establishing EVM as the de facto method of managing DoD programs. A change in Department culture is necessary to encourage PMs to identify and quantify the impacts of schedule slips and cost overruns. PMs may be reluctant to disclose negative information about their programs.

Contractors often worry that poor performance may result in program cancellation, reduced profits, or damaging performance evaluations. As a result, they may circumvent proper EVM practices to keep EVM metrics favorable and problems hidden. For instance, contractors seek to prevent or delay bad news by "front-loading" their PMBs. Continuous replanning has become the norm, and the focus of program activities has shifted from program planning and management to managing funds and maintaining the appearance of progress in the acquisition management process. Senior Department leaders must demonstrate that they rely on EVM information to make decisions and that Component Acquisition Executives, Systems Commanders, PEOs, and PMs will be held accountable for using EVM to manage their programs. Moreover, the Department must show that it is willing to accept bad news in order to help programs navigate the trade space between the cost, schedule, and technical parameters of a program.

EVM is a management function not unlike systems engineering in its importance in managing risky DoD programs. Effective implementation and use of EVM requires a combination of (1) rigorous planning to establish a realistic and executable PMB, (2) analytical abilities to convert Contract Performance Report (CPR) and Integrated Master Schedule (IMS) data into actionable management information, and (3) understanding of all aspects of DoD contractors' management systems to determine whether the data provided are timely, valid, and accurate.

Over the past 10 years, the EVM skills of DoD's acquisition workforce have atrophied. Cultural change will be best enabled by a commitment within the Department to develop and train its acquisition workforce in the use of EVM as a management tool. The Department's core workforce of EVM subject matter experts and skilled practitioners has been depleted, forcing buying Commands to rely heavily on contractors to fulfill EVM roles and responsibilities. Changing this paradigm will require the Department to invest resources to recruit and train a

workforce skilled in all aspects of EVM. However, beyond the analyst level, as with any program management discipline, the PM and IPT leads must advocate for EVM and take ownership in the effective application and use of EVM.

b. Perceptual Challenges

EVM delivers major benefits, but the Department continues to face challenges related to the implementation of EVM. Those challenges are perceptual, in large part, driven by cultural and operational challenges not yet overcome. DoD can improve the recognition and genuine acceptance of EVM as a set of best business practices for making timely and informed decisions about a program by addressing six misperceptions about EVM. They are discussed below. Collectively, they stem from the nature of the work being executed, from the roles of the decision-maker in the implementation process, and from factors external to that process. The Department can address those incorrect perceptions by focusing on a combination of processes, people, and tools for program and project planning and control.

While the Department can improve in the recognition and genuine acceptance of EVM as a set of best business practices focusing on a combination of processes, people, and tools for enterprise project planning and control, no equally rigorous alternative to EVM exists. The use of alternate, less disciplined management processes would result in a proliferation of approaches resulting in inconsistent measures and metrics, and would only hinder the early detection of emerging cost and schedule issues in a timely manner.

i. Perception: EVM Is Too Rigid

Because of the emphasis on detailed, up-front planning, controls, and quantification of expected results, many throughout the Department and industry believe that EVM is too rigid and complicated. However, the EVM process purposely allows for flexibility and scalability by considering complexity and risk parameters. EVM's flexibility comes from the common-sense, practical application of its 32 guiding principles, as described in ANSI/EIA-748 (see Appendix C). These guidelines enable each implementing entity to design an EVMS that best fits the dynamics of the organization and the work it does, from risky DoD research and development programs, to large construction jobs, to well-defined nuclear power plant refueling outages. EVM delivers major benefits in all scenarios.

EVM is expressed as a set of interrelated guidelines, readily allowing for many exceptions or levels of application that accomplish the goal of integrating cost, schedule, and performance parameters of a program. These exceptions can be applied across programs. For example, one part of a program may be monitored and reported at one level of detail, while other parts are managed at a summary level. Reporting levels and periods vary from program to program as well, without jeopardizing the integrity of the process or affecting the value of the data for program management. Flexibility and scalability in EVM implementation also come from developing a product-oriented WBS to help scope, plan, schedule, and budget the work at the appropriate levels. If the WBS is set up and actual costs collected correctly, PMs will find EVM to be a powerful, flexible tool for program management.

ii. Perception: EVM Lacks Precise, Quantifiable Measures That Ensure Reliable Reporting of "Value"

Some believe that EVM has no provision to measure the quality of work completed, so it is impossible for EVM to indicate when work is under budget or ahead of schedule and when the scope of work is fully executed. On the contrary, the EVM process is reliable and accurate only if measures of technical performance (engineering-designated technical performance measures) are identified and associated with completion of appropriate work packages, enabling progress to be objectively assessed. Of course, the right things must be measured—and they must be measured the right way—to ensure EVM's success. For example, the earned value completion criteria must be based on technical performance, the quality of work must be verified, and criteria must be defined clearly and unambiguously. If good technical performance measures are not used, programs could report 100 percent of earned value (or credit for work performed), even though they are behind schedule in terms of validating requirements, completing the preliminary design, meeting weight targets, or delivering software releases that meet the requirements.

EVM can be an effective program management tool only if it is integrated with technical performance, if the EVM processes are augmented with a rigorous systems engineering process, and if the systems engineering products are costed and included in EVM tracking. If the systems engineering life-cycle management method is integrated with the planning of the PMB, then EVM will accurately measure technical performance and progress. Systems engineering and EVM should be integrated and not stove-piped. The PM should ensure that the EVM process measures the quality and technical maturity of technical work products instead of just the quantity of work performed.

iii. Perception: EVM Is a Lagging Indicator

While many EVM metrics are based on analysis of actual cost "history", even these are useful as indicators to confirm trends that may signal future issues, such as adverse cost or schedule conditions and lagging indicators to confirm a cost, schedule, or performance trend. The critical path and float values are clear leading indicators of the program, allowing the PM to anticipate and speculate on trends in the completion of scheduled work. Current and cumulative cost and schedule performance variances, on the other hand, are one of the most popular lagging indicators. They compare actual accomplishment of scheduled work and associated costs against an integrated view of the program schedule and budget, providing real visibility of progress, an indication of the reliability of the PMB, and bases for estimation of the cost to complete the project. This valuable trend information provides insights into the ultimate outcomes of the program. Declining performance variances indicate that the program is doing poorly and that, without corrective action, it will continue to do so.

By applying EVM analytics, PMs can develop models that answer "what-if" questions for replanning scenarios, thereby significantly supporting the decision-making process in program management. The use of EVM in several industries has demonstrated that a wide range of specialized metrics can be developed to answer specific management questions. The development of these specialized metrics requires a good mastery and in-depth understanding of basic EVM and can be a major factor in convincing managers to use EVM.

iv. Perception: EVM Ensures On Time and Within Budget Programs

EVM tips the scales toward program success by enabling PMs to pinpoint cost and schedule problems early and to make appropriate adjustments. Nevertheless, myriad other factors, such as funding instability, changing requirements, overly optimistic estimates, performance shortfalls, and even unpredictable "unknowns," can get in the way. Successful outcomes require qualified PMs and IPTs, backed by management systems that provide immediate access to reliable and accurate data and information on program costs, schedule, and technical performance. People make decisions; systems do not. EVM does not prevent schedule delays and cost overruns, but it does provide early warning and insight into program performance.

v. Perception: EVM Is Too Expensive Compared with the Benefits

EVM is both shunned and embraced. Opponents generally believe that the cost and effort of implementing EVM do not offset the benefits attained from its implementation. However, proponents recognize that EVM is inherent to a PM's planning, scheduling, and management control responsibilities and will cite the cost savings to the overall program, the improved transparency, and the analysis and control derived from EVM's implementation.

It is a false perception to believe that eliminating the requirement for EVM yields significant cost savings. These costs would be incurred in the absence of any requirement for an EVMS because EVM practices are inherent in effective program management. While some companies implement EVM only to achieve the minimum contractual requirements for compliance, others recognize that EVM adds little cost to a rigorous, integrated program management and systems engineering process.

vi. Perception: EVM Is a Financial Report Rather than a Management Tool

EVM is not a financial report. Instead, EVM measures the performance and health of a program. This tool integrates the cost, schedule, and technical progress of a program and links these areas to the project's risk management process. EVM requires discipline in all aspects of the program; it requires that the organization performing the tasks plan the work and then work to that plan. Unanticipated problems may occur that cause deviations from the initial plan; however, good initial planning followed by continual analysis and replanning allows a PM to better mitigate issues and concerns as they arise. The use of EVM helps the PM determine the current project status by answering questions such as these: Are we on schedule? Are we on cost? Do the costs reflect the true accomplishments? What are our variances? EVM identifies trends that help a PM better predict where the project or a particular element is headed. EVM provides a method and data to establish realistic Estimates at Completion (EAC) for the program. While financial information on actual costs is required for EVM, the true value of EVM is that it provides reliable information that integrates technical, cost, and schedule parameters, enabling managers to make better-informed decisions.

c. Operational Challenges

Programs implementing EVM face several operational obstacles. They fall into four main categories: (1) expertise of EVM stakeholders, (2) EVM planning and requirements definition, (3) contractor data quality and access to contractor data, and (4) other operational issues.

i. Expertise of EVM Stakeholders

To effectively use EVM, providers and consumers of EVM data need to have the appropriate expertise. During the 1990s period of acquisition reform and the transition of EVM oversight from the Military Departments to DCMA, the Military Departments let their EVM expertise atrophy. Meanwhile, DCMA had not been adequately staffed to fulfill its responsibility to oversee contractor compliance. This lack of oversight led to a decline in attention to EVM within industry. With DCMA and the Military Departments lacking appropriate oversight capability, no one in the government was monitoring the quality of EVMS across industry. Now, the Department is attempting to rebuild its EVM competency. As a result, DoD and its contractors are both competing for a limited pool of knowledgeable EVM practitioners and are trying to develop methods for recreating the knowledge base.

The lack of EVM expertise across many areas of DoD and the Defense industry has lasting impacts on how effectively the Department defines its EVM requirements and uses the EVM information it does receive. If PMs do not understand EVM and EVM analysts are inexperienced, they may not put appropriate EVM requirements on contract, which will limit the information that PMs have during execution of the contract. The preaward activities are important, because they determine how contractors will implement the EVMS, develop the program plan, and report performance management data needed by PMs. Once contracts are executed, EVM stakeholders must translate EVM data into information, which requires training and experience. The PM must understand the information provided by the EVM analyst to interpret the program risk, tailor requirements based on that risk and past contractor performance, and make decisions. Because of inadequate EVM expertise across the Department, some PMs are not using EVM to effectively manage their programs.

Not only is there a lack of experienced EVM practitioners, but PMs, PEOs, and other managers with acquisition oversight responsibilities do not consistently and effectively use EVM in making program decisions. Remedies are not consistently sought or enforced in cases where contractors cannot provide reliable and accurate EVM data because they do not comply with their approved EVM systems. EVM data discussed at PEO and higher levels generally focus on performance indices or cost and schedule variances, rather than the underlying contractor performance issues. More needs to be done to verify that programs comply with EVM policy, that contractors comply with the requirement for a valid EVMS, and they submit reliable and timely data. Senior leaders need to recognize that EVM is a key program management process, larger than the basic metrics it produces, and they need to understand and use the broader principles of EVM in their discussions with PMs.

ii. EVM Planning and Requirements Definition

EVM measures variances from a PMB to determine where managers should focus their attention. Those unfamiliar with EVM often measure its effectiveness by how closely the delivery of the final product aligns with the baseline. However, government contracts can make meeting EVM objectives difficult. For example, program budgets are often established years before program requirements have been fully defined. This requires the program to "fit in the box" of estimates that did not take the latest program definition into account. In addition, the nature of system development in DoD is to design systems that do not yet exist. Because there is no direct analogue for a system to be developed, program cost and schedule estimates are inherently uncertain. Even similar historical programs are not directly comparable, because the newer program will use newer technologies. The estimates used to form the EVM PMB cannot be perfect predictors of actual costs.

Another challenge to meeting cost and schedule objectives is requirements creep. EVM is designed to incorporate changes to the contract and baseline; however, trend analysis can be applied only to the known scope. Scope creep can also occur within the definitive contract. It is common for cost and schedule growth to arise due to changes that are within the defined scope of the contract but not reflected in the EVM baseline. This creep arises because of lack of communication between the government and contractor, through poor requirements definition, or an inadequate IBR. Either poor initial estimates or incessant scope creep can impair management's visibility into the cause of variances from the baseline. Variances are driven by one of two conditions: problems in planning the work, or problems in executing the plan. Problems with planning the work take longer to identify, because they are harder to diagnose.

iii. Contractor Data Quality and Access

The effectiveness of the Department's use of EVM is limited by the underlying quality of the data and by the inability to gain access to contractor data, due to antiquated systems. Data quality is an issue because, with multiple entities (DCMA, IC Agencies, and industry) responsible for assessing the compliance of contractor EVMS, there is a risk of conflicting opinions and direction. These contradictions can affect the integrity and consistency of reporting.

DoD's access to data is an issue because many contractors have not updated their business systems in decades. These older systems rely on manual interfaces that are prone to errors. In addition, industry has not fulfilled its role of self-surveillance. DCMA and the IC have found, in many reviews, that contractors are not compliant with the guidelines in ANSI/EIA-748 and have not adequately identified those deficiencies themselves.

To mitigate these issues between DCMA and the IC, DoD established a Reciprocity Working Group to help ensure the consistent application of the EVM guidelines across the Department.

iv. Other Operational Issues

Two other operational issues concern the development and implementation of EVM policies and the integration of EVM across other functional disciplines. As in any large organization, there are errors of communication, interpretation, and implementation that result in inconsistent

application of DoD EVM policy. As discussed in Section I.C., the Military Departments and Agencies are implementing oversight processes to ensure that contract data requirements are correct, that accurate, complete, and timely data are delivered, and that PMs and the other managers have the tools necessary to make effective use of the data.

EVM should permeate every aspect of program management. Managers should rely on EVM data to make decisions; the engineering community should establish technical performance measures that enable objective confirmation that tasks are complete; funding and budgetary decisions should be informed by estimates that reflect the latest EVM data; and leaders should look at portfolio metrics driven by EVM data. The Department continues to strive to achieve this level of EVM integration.

D. Requirement 4, Training, Data Quality, and Information Technology

Section 887 (a)(4) calls for "a discussion of the methodology of the Department for earned value management implementation, including data quality issues, training, and information technology systems used to integrate and transmit earned value management data."

1. Method

Because training issues cut across several functional areas and address many issues other than data quality and information technology, the discussions below also treat the two topics separately.

a. Training

The DST evaluated the state of the EVM training available within DoD, focusing on answering the following question: Are we providing the right content to the right people at the right time with the best delivery method from the best source? EVM training in DoD spans the curricula offered by DAU, DoD's enterprise-wide training provider, and organization-specific EVM training provided by the Military Departments and three Defense Agencies: DCMA, National Geospatial-Intelligence Agency (NGA), and Missile Defense Agency (MDA).

b. Data Quality and Information Technology

The DST began by defining two key aspects of data quality: data relevance and data reliability. "Data relevance" refers to the availability of data to decision makers; decision makers must receive all required data on time, and the data must be consistent across systems. "Data reliability" measures whether the data received reflect the actual progress toward developing and delivering the product. Although both aspects are important for effective decision making within DoD, the DST focused on data relevance for Requirement 4 and addressed data reliability for Requirement 5. As a starting point for considering data relevance, the DST reviewed reports and other information sent to DoD from the Components to determine how EVM data are communicated and the processes that are in place to support this flow of information. Once the DST determined where to find the data, it evaluated the data for timing, consistency, and completeness. After it had made an initial assessment concerning the data provided, the DST considered potential processes to address data quality issues.

2. Findings

a. Training

DoD needs to educate PMs, functional experts, and leaders from multiple career fields and organizational levels on the use of EVM to help improve the likelihood of success for the multitude of complex programs and systems acquired by the Department. PMs need to understand the value and tenets of EVM in order to use it efficiently and effectively to plan and control cost and schedule and to meet performance objectives in a risk-intensive environment. EVM functional experts need in-depth knowledge of EVM principles, practices, and tools and must be able to apply that knowledge to assess the accuracy of EVM data and to analyze and draw conclusions from EVM information. Leaders at all levels in the Department need to understand how to use EVM information for program oversight and decision making.

DAU offers a variety of EVM training, including formal certification courses, tailored training, and continuous learning modules. Training is provided using various formats, including resident classroom and online courses through formal lectures, simulations, and case studies. DAU also provides "action learning" in the form of program start-up workshops, which attempt to foster—within the program team—an understanding of several facets of program execution, including the use of EVM. In addition, DAU maintains an active online community of practice that provides a venue for practitioners and the extended acquisition community to share policy information and best practices and to engage in discussions about EVM-related topics of interest.

The DoD Components, to varying degrees, have developed (or are in the process of developing) in-house, specialized EVM training to supplement the training available at DAU. In the Navy, the Naval Air Systems Command has made noteworthy progress through its use of mobile training teams to support program offices. Two Air Force centers (Electronic Systems Center and Aeronautical Systems Center) provide a variety of EVM-related training. DCMA—as the agency responsible for assessing the efficacy of contractor EVMS—offers classes ranging from system surveillance to critical path analysis. In addition, NGA and MDA have relatively robust EVM training programs.

Despite the vast array of EVM courses and approaches available in DoD, the EVM training needs of the Department are not being met adequately. That is, the analysis revealed material gaps between the needs of the Department and the current state of available training. Specifically:

- The formal training offered by DAU is targeted primarily to the business career field (in 2008, 2,462 business students successfully graduated from EVM courses and 8,116 (predominantly business students) completed EVM continuous learning modules). EVM is a multidisciplinary process; however, EVM training is not adequate in other relevant career fields (program management, systems engineering, contracting). In addition, many of the examples provided in the training are too simplistic or not relevant to the learner's needs. These deficiencies have led some DoD Components to develop their own in-house training or to request tailored training support from DAU.

- Training tends to be taken only when it is a requirement associated with career field certification. Although a need for additional courses in disciplines such as scheduling has been identified, and DAU has developed formal courses beyond the minimum required for certification, personnel have no real incentive to take those courses. In fact, several offerings of a new scheduling course were cancelled due to a lack of attendees.

- Those who receive training tend to accomplish it early in their careers, without much direct relevant experience. Tailored, just-in-time training more relevant to program and job circumstances is rare. With the possible exception of the cases noted above, the DoD Components have not developed a capacity to provide additional supplemental EVM training or outreach to program offices.

- Although the availability of DAU training has improved, and more training is accessible online to a wider audience, the amount of EVM training in mandatory career training courses has been reduced substantially over the past decade. The business career field is now the only career field with any significant emphasis on EVM during its formal certification path.

- Training within the Department is primarily individual training, with each course focused on a comparatively narrow subset of the workforce that specializes in a particular function. Although the practice of EVM is a team effort across multiple disciplines, there are only a few examples of "team training" offered to program offices, either onsite at the program location or in residence at DAU.

- No formal certification of proficiency in EVM is recognized within DoD, nor is a formal incentive system in place to motivate individuals or groups to demonstrate proficiency in this discipline.

- Although DAU's EVM community of practice, which is one of the most active online networks, is an effective adjunct, it is not an adequate substitute for training and other venues for learning about EVM and its use on DoD contracts.

b. Data Quality and Information Technology

The primary method used by senior Department leaders to communicate EVM information is the Defense Acquisition Executive Summary (DAES), which addresses both broad programmatic issues and EVM performance on key contracts. Information presented in the DAES is collected from each of the Military Departments via DoD's Defense Acquisition Management Information Retrieval (DAMIR) system. Historically, information for the DAES was collected quarterly; by the time it reached senior leaders, the information was often outdated. In 2008, DoD began collecting this information monthly. This change helped address a key aspect of data relevance: timeliness.

To address data consistency, DoD began a pilot EVM Central Repository in 2006. After EVMCR's successful demonstration, completed in July 2007, USD(AT&L) began to populate the EVMCR with ACAT I C and ACAT I D programs. In 2008, the EVMCR was expanded to include MAIS programs. The EVMCR is now DoD's authoritative source of contractor EVM

information for ACAT I programs, eliminating the concern that EVM data were presented differently across DoD. Contractors are required to post their data directly to the repository, for download and view by PMs and others. (As the EVMCR matures, DoD will consider application beyond ACAT I programs.) Not only does the EVMCR address data consistency, but it also addresses data timeliness by making the data available as soon as they are received from contractors.

DoD programs continue to make progress in complying with the EVMCR requirements. As of February 2009, only seven programs were not regularly posting all of the required data. Further, measurement of compliance continues to be refined. Now the Department is looking at other factors, such as a file format, to facilitate automated parsing of data, that can be shared with various stakeholders.

A third DoD initiative that addresses data relevance is Service Oriented Architecture (SOA), which enables the transfer of information between various databases across the Department. The SOA will help ensure data consistency and reduce the need to enter the same information into various systems. The SOA initiative is already underway as the information systems across the Military Departments push data to DAMIR to support the DAES and Selected Acquisition Report processes. The Department is developing SOA protocols that will work with the EVMCR. Currently, EVM data must be transcribed from the EVMCR into the Military Departments' systems, then pushed to DAMIR. When the EVMCR SOA initiative is complete, EVM data will be extracted from the EVMCR and pushed to the Military Departments' systems and DAMIR without human intervention. The SOA addresses data consistency by ensuring that the same data are used across the Department and eliminating the possibility of transcription errors.

Another aspect of data relevance is data completeness, which refers to whether contractors have provided all of the data points requested by the Department. A recent review of the data posted in DAMIR revealed that 35 percent of the EVM data points requested were not provided and that 37 percent of all contractual data points were not provided. The impact of missing data may vary depending on the specific data and risks on the specific program. To address the problem of data completeness, USD(AT&L) has begun development of an EVM diagnostic dashboard to be used in conjunction with the EVMCR. As highlighted in Appendix D, this tool will evaluate the data provided by the contractor to ensure the inclusion of data points required by DoD leaders. In addition, the tool will check to ensure that the data are internally consistent, showing appropriate relationships among data points. For instance, the percentage complete should be no greater than 100 percent, and the estimated cost at completion should be no less than actual cost incurred to date. Violations of these types of relationships indicate fundamental problems with the data that must be resolved.

E. Requirement 5, EVM Implementation and Accuracy of EVM Data and Impact on Meeting Program Objectives

Section 887 (a) (5) requires "an evaluation of the accuracy of the earned value management data provided by vendors to the Federal Government concerning acquisition categories I and II

programs, with a discussion of the impact of this data on the ability of the Department to achieve program objectives."

1. Method

There are two broad categories by which EVM data compliance can be evaluated: the "accuracy" of the data that are collected in conveying the actual execution status of a given project, and the more basic compliance-related issues associated with data completeness, coherence, timeliness, and consistency. EVM data reporting that meets the latter criteria may, or may not, be adequate with regard to the all-important criteria of whether it conveys the execution status. Reporting that is not compliant in terms of completeness, consistency, timeliness, or coherence is virtually certain to not convey the correct execution situation.

Reliable EVM data and accurate reporting can be achieved only through the deployment of a disciplined and compliant EVMS, which can, among other things, ensure the development of a resource-aligned, time-phased PMB using objective measures of technical achievement. The best measure the Department has for determining the relevance and reliability of EVM data in measuring true performance and effectiveness is the status of the contractor's EVMS validation and compliance as determined by DCMA.

2. Findings

DCMA has documented EVMS deficiencies (discussed further in Requirement 6) relating to data reliability. The production of inaccurate data from an EVMS points to a contractor's inability to consistently implement program management systems and processes for assessing and reporting emerging cost and schedule performance issues. Therefore, even if the data provided to leaders are timely, consistent, and complete, they are still of little use if they do not accurately portray the true status of the project. DoD has some processes in place to address the reliability of the data received from contractors, but it is still a concern.

As required by the DFARS, contracts that exceed certain thresholds contain a requirement that the contractors use an EVMS that complies with ANSI/EIA-748, the industry EVMS standard that defines basic EVMS requirements as 32 guidelines to ensure that management systems produce reliable performance data. DCMA has the responsibility for assessing contractor compliance to the EVMS standard on DoD contracts.[3] Once it has validated the EVMS, DCMA conducts ongoing surveillance of the contractor system to ensure that it remains compliant. One exception is the Navy's Supervisor of Shipbuilding (SUPSHIP), which performs the surveillance at the shipyards.

Of the last 13 comprehensive reviews conducted by DCMA, only two contractors were found to be compliant with ANSI/EIA-748. Another four were found to be compliant after multiple reviews and support from the government. The remaining seven contractors were found to be noncompliant with at least half of the ANSI/EIA-748 guidelines.

[3] The IC is responsible for validating EVMS, coordinating EVMS reviews, serving as subject matter experts, and establishing standard processes across the IC Agencies.

In its analysis of the issues, the DST uncovered several common themes:

- The various subsystems that make up many contractors' EVMS are not integrated, resulting in inconsistent portrayals of status.
- The schedules often cannot show downstream impacts of problems or cannot determine the critical path driving contract completion.
- Contractors frequently do not have adequate work authorization processes for developing a detailed, time-phased baseline plan.
- When assessing cost and schedule variances, contractors cannot effectively identify the root cause, impact, and appropriate corrective actions.
- Contractors do not have a process for developing reliable estimates at completion.
- Contractor change control processes do not maintain the integrity of the PMB.
- Contractors treat EVM as a reporting requirement rather than the management process it is intended to be.

The end result is that many Defense contractors cannot accurately predict outcomes that affect program costs or deliveries.

These types of data quality problems hinder the government's ability to meet program objectives by delaying or masking insight into developing problems. For instance, there is a method for measuring performance called Level of Effort (LOE). LOE tasks measure performance by the passage of time rather than by accomplishment of a discrete task. LOE is acceptable in some instances, but it can be abused. LOE does not show any schedule variances, nor does it provide meaningful cost variances. When used heavily during program startup (when contracts may not yet be fully staffed), LOE gives the impression that work is on schedule and under budget. In reality, understaffing causes schedule delays and usually results in downstream overruns due to the work-around plans required.

Without well-developed schedules, the government and the contractor team cannot effectively reassign resources to the tasks that will drive contract completion. The schedule should be based on a precedence logic network that shows the order in which tasks need to be completed. This network logic facilitates a critical path, the longest sequence of tasks to completing the effort. Identification of the critical path and near-critical paths helps managers prioritize those activities to keep on schedule. DoD often finds that contractor schedules cannot effectively identify these critical paths, because the task relationships are not properly defined or artificial constraints are added to the schedule that override the task relationships. These problems prevent managers from making informed tradeoffs about task prioritization, the need to work overtime, and other tradeoffs that could be made to keep on schedule.

Contractors often do not have robust procedures or processes for updating their estimated cost at completion. Contractor managers cannot explain how or if risks and opportunities were incorporated into their estimates. During many assessments, managers cannot explain disparities

between their cost efficiency to date and their projected cost efficiency for remaining work. DoD has also found instances in which contractors' estimates for cost at completion were lower than the actual costs already incurred. Although the government is responsible for developing its own cost estimates, contractor estimates provide additional information and different assumptions. The ability to assess these different estimates and assumptions help government PMs better assess the state of the contract and take appropriate action. Unrealistic estimates from the contractor limit the amount of insight and outside information provided to DoD managers.

Improper changes to the baseline plan also affect government programs. Because change is inevitable, EVM allows for controlled changes to the PMB. When done properly, baseline changes will not impair program management. However, DoD has found many instances of inappropriate changes, such as arbitrarily changing past variances, moving budgets to mask overruns, and making changes that were not properly authorized. Inappropriate changes will not allow early insight into developing issues and will prevent managers from making effective decisions to mitigate problems.

Part of the reason that EVM data quality is a problem is that PMs and DoD decision makers have not historically emphasized this aspect of EVM. Specifically, DoD did not actively assess data quality, and when problems were uncovered, there were no consequences.

Beginning in 2006, USD(AT&L) began looking at a set of tripwires during the monthly DAES reviews. One of the primary tripwires is the status of the contractor's EVMS. Since 2006, DCMA has suspended one contractor's previously approved EVMS due to ongoing issues. In two cases, DoD has withheld funds when the contractors did not show adequate progress toward taking corrective actions to resolve EVMS issues. Some actions have been taken to provide disincentives for noncompliance with the EVMS standard, but DoD has no standard guidance on which actions programs should take and when those actions should be taken.

The NDIA Program Management Systems Committee (PMSC) is the industry organization responsible for EVM, including ANSI/EIA-748. The PMSC is comprised of EVM functional specialists representing the largest defense contractors and vendors of EVM products and services. When first established, these company EVM focal points were not empowered organizationally to commit their companies for improving the "state of EVM" or to do more than write guidance and point out why the government is party to their inability to implement EVM in compliance with contractual requirements. However, industry attention has improved and the support is being provided to the members of the PMSC. OSD and the DoD Component EVM focal points also participate in the NDIA PMSC. With executive-level participation and a commitment to communication by both DoD and industry members, the PMSC is becoming more effective as a forum to address EVM data quality issues across the defense industry.

Whether DoD works with NDIA as a group or with individual contractors, it needs to do a better job of guiding industry toward resolution of data quality issues. Since the 1990s, DoD has had a hands-off approach to EVM issue resolution because contractors were responsible for managing their own management processes. Industry has lost many of its EVM experts, just as DoD has, and needs additional guidance. The Department is committed to working with industry to implement solutions that facilitate delivery of timely, complete, and accurate EVM data. Both DoD and its contractors need to determine how best to utilize scarce EVM experts, while training

the next generation of EVM analysts. In the end, it is DoD and the taxpayer that bear the consequences of unreliable contract performance information.

F. Requirement 6, Criteria for Evaluating EVM Success

Section 887 (a) (6) requires "a description of the criteria used by the Department to evaluate the success of earned value management in delivering program objectives, with illustrative data and examples covering not less than three years."

1. Method

The same group of Department subject matter experts that identified the challenges facing the Department's implementation of EVM in C., above, identified criteria for evaluating the success of the Department's use of EVM. The group held weekly discussions to share and document findings and to communicate points of view with one another and directly to the group leader, who addressed and categorized the findings. For illustrative data and examples of EVM's success in delivering program objectives, the DST group relied on two sources of information: DAES reports, and the results of ANSI/EIA-748 compliance reviews.

2. Findings

DST findings focus on the criteria for evaluating success and illustrative data and examples.

a. Criteria for Evaluating Success

The overarching measure of success is the extent to which DoD and industry PMs and senior managers use information from EVM in managing their programs, portfolios, and budgets. Managers use the information that they perceive to be the most current, accurate, and effective in delivering the outcomes they seek. Therefore, we will know that EVM policies and processes are successful when program managers and senior Department officials are regularly using information derived from EVM data. Within this overall context, the Department primarily uses two criteria to evaluate the integrity of EVM data:

- The extent to which EVMS adhere to the 32 guidelines in ANSI/EIA-748
- The extent to which contracts with EVM requirements use IBRs.

i. ANSI/EIA-748

The first criterion that the Department uses to evaluate the success of EVM in delivering program objectives is the extent to which industry complies with the 32 guiding principles as described in ANSI/EIA-748. The guidelines, which DoD adopted in 1999, are grouped into five categories, as outlined in Appendix C. DCMA evaluates contractor management systems and determines whether they are compliant. After a system's initial acceptance, compliance reviews verify that the contractor's accepted system complies with the DoD criteria, in the context of a particular contract. Surveillance activities are conducted on a recurring basis to verify ongoing system compliance.

ii. Integrated Baseline Reviews

The second criterion that the Department uses to facilitate the success of EVM in delivering program objectives is the use of IBRs on contracts with EVM requirements. According to acquisition policy, PMs must conduct IBRs on contracts with EVM requirements. IBRs are intended to provide a mutual understanding of risks inherent in contractors' performance plans and underlying management control systems. IBRs are an essential element of a PM's risk management approach and an essential tool in the PM's toolbox.

IBRs tell program leaders what the contractor manager (sometimes referred to as the control account manager) is trying to accomplish and ultimately how that effort fits into the larger program. If done properly, a clear plan will assess the content of work authorized versus the scope of work baselined, document the schedule needed to accomplish the work, examine the time-phasing of resources to be allocated to the work, describe the method for collecting earned value, and describe the PMB management approach. The government team must understand the entire scope of work for each control account in the program.

These assessments are conducted soon after contract award—within 180 days—and after major contract modifications or restructures. Once the IBR has been successfully completed, the team will have an excellent understanding of the challenges ahead. A successful IBR answers the PM's most pressing questions: Have adequate resources been allocated to do the job? Does the PM understand the plan and how to make changes to the plan? Does the PM understand the risks and implications of risks in terms of technical and cost impacts and when considering corrective actions?

b. Illustrative Data and Examples

i. Defense Acquisition Executive Summary Reports

The Department requires ACAT I programs to provide a DAES report. When a contract contains an EVM requirement, DCMA provides a status report on the contract with respect to established earned value tripwires in support of DAES reviews. DoD's implementation of EVM tripwire metrics draws senior leaders' attention to programs with unacceptable variances and provides an opportunity for senior leaders to apply the organization's resources in correcting any issues.

The DAES report provides standard, comprehensive reporting on designated programs. It is designed to regularly and systematically provide indications of both potential and actual program problems before they become significant. A monthly DAES meeting to review selected programs facilitates communication among key stakeholders in OSD and the Military Departments and assigns action items for follow-up. The DAES process enables USD(AT&L) to manage and oversee MDAPs and enables Department leaders to conduct detailed assessments of program status, including whether the program is delivering its objectives.

The PM is accountable for the completeness, accuracy, and consistency of the DAES report. The report passes through the PEO and Component Acquisition Executive and is received in USD(AT&L) for distribution to the several OSD staffs involved with acquisition oversight. The OSD staff organizations then prepare assessments of each program. The purpose of the DAES

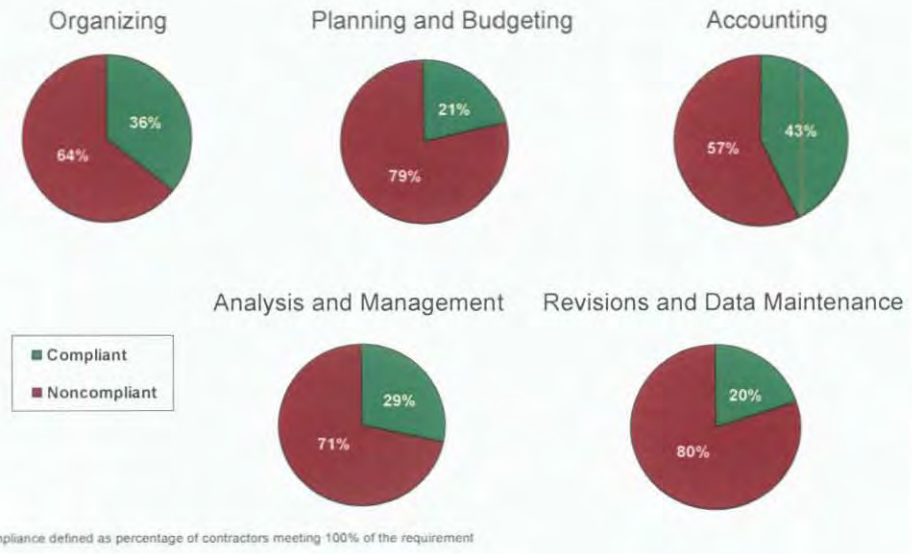
review process is to provide timely information to the DoD acquisition hierarchy on MDAP execution and progress, policy decisions, and early problem identification. The use by senior DoD managers of EVM information and the tripwires based on analysis of EVM data demonstrate that these senior managers recognize the value of EVM as a necessary component of successful program management.

ii. ANSI/EIA-748 Compliance Reviews: 2007 to Present

Figures 1 and 2 depict the results of DCMA EVMS assessments, since 2007, of contractor compliance with the guidelines in ANSI/EIA-748. As the figures show, overall contractor compliance is not up to par.

Figure 1 depicts the results of EVMS assessments in terms of the five categories of guidelines: organizing, planning and budgeting, accounting, analysis and management, and revisions and data maintenance. The figure shows that contractor processes and procedures are below standard and do not provide the requisite definition and discipline to most effectively plan and control complex, large-dollar weapon systems acquisition programs. Documented findings by DCMA indicate that a large percentage of control account managers are disconnected from their company's basic EVMS functions and cannot satisfactorily demonstrate that they understand and use documented EVM processes, procedures, and tools to manage their work. These weaknesses adversely impact the validity of the data used in internal and external decision-making processes, as discussed elsewhere in this report.

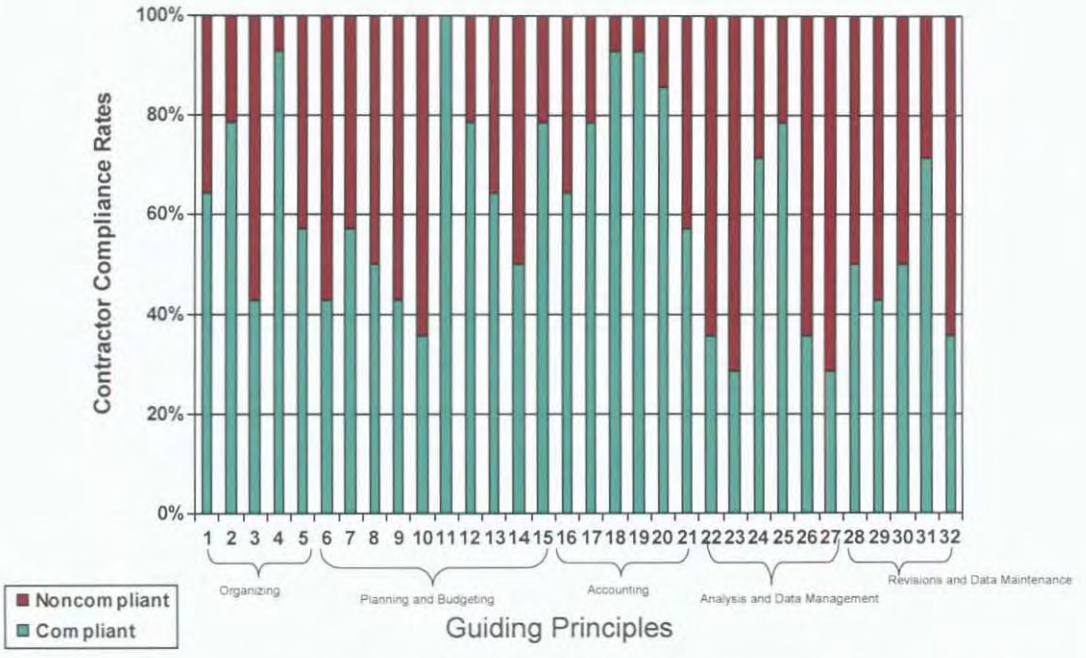
Figure 1. Results of 2007–Present DCMA ANSI/EIA-748 Compliance Reviews, by the Standard's Five Categories



*Compliance defined as percentage of contractors meeting 100% of the requirement

Figure 2 depicts the results of EVMS assessments for each of the 32 ANSI/EIA-748 guidelines. As the figure shows, most contractors are not in compliance with a large percentage of the guidelines.

Figure 2. Results of 2007–Present DCMA ANSI/EIA-748 Compliance Reviews, by the Standard's 32 Guidelines



The following are significant deficiencies:

- Vague and confusing EVMS documentation
- Lack of clearly delineated roles and responsibilities
- Use of management reserve to alter internal and subcontract performance levels and overruns
- Work authorization and change control processes that do not extend to appropriate levels
- Cost and schedule integration problems that undermine the validity of data
- Use of inappropriate earned value techniques for assessing material, subcontracts, and rework
- Budget and data reconciliation issues
- Lack of IBR rigor and use of front-loaded baselines
- Baseline fluctuations and frequent replanning

- Current period and retroactive changes
- Earned value techniques not tied to technical accomplishment
- Untimely, unrealistic revised estimates.

These and other identified deficiencies raise significant concerns regarding management processes and practices and industry's ability to mitigate emerging cost and schedule issues in a timely manner. Because the accuracy and validity of performance measurement data are suspect, the Department's ability to use EVM data to determine product delivery dates and to develop timely and accurate estimates of program completion costs is adversely impacted.

The current condition of DoD's preferred program management tool remains a question. Audit results show that, since 1997, the utility of EVM has declined to a level where it does not serve its intended purpose. Compliance reviews have surfaced concerns that range from the integration of systems, to incomplete planning and scheduling, to infrequent estimates at completion, to excessive retroactive changes. Moreover, documented evidence reveals that both government and industry consider EVM a financial reporting system rather than a management tool—its intended purpose.

iii. Example: Successful Corrective Action Plan Leads to EVMS Compliance

Bell Helicopter's EMVS Corrective Action Plan (CAP) is an example of a successful CAP that led to EVMS compliance.[4] DCMA began to scrutinize Bell's EVMS as early as 2000, with several compliance and other reviews occurring over the subsequent periods. In March 2006, despite Bell's efforts to improve, DCMA formally disapproved the contractor's EVMS and found it to be noncompliant with the ANSI/EIA-748 guidelines. Following this review, the contractor developed a comprehensive and integrated CAP that drove significant EVMS improvements. DCMA conducted a follow-on validation review in August 2008 and noted significant improvement. Although 3 of 32 guidelines were still noncompliant, the results were dramatically better than those of the March 2006 review, in which 14 guidelines were considered noncompliant. In April 2009, DCMA conducted a final validation review and found the contractor to be fully compliant on all 32 guidelines. A new Advanced Agreement was executed in May 2009, formally approving the contractor's EVMS. Appendix E offers details about the successful CAP in this example.

G. Requirement 7, Methodology for Establishing EVM Baselines

Section 887 (a) (7) (as amended by Section 302 of the Weapon Systems Acquisition Reform Act of 2009) calls for "A discussion of the methodology used to establish appropriate baselines for earned value management at the award of a contract or commencement of a program, whichever is earlier."

[4] The information in this subsection, as well as the details in Appendix E, are shared with permission from Bell Helicopter.

1. Method

The DST empanelled a group of individuals with program management and EVM expertise. They included representatives from the Military Departments, Defense Agencies, and OSD. Reviewing the Department's documented processes for establishing baselines, the team members relied on their professional judgment and experience to develop this section. First the team considered baseline attributes from a theoretical perspective. Next, the team identified the benefits that potentially accrue from such attributes. Finally, it considered the necessary actions to maintain a relevant baseline throughout the life of a program.

2. Findings

In accordance with DoD acquisition policy, PMs must conduct IBRs on contracts with EVM requirements. The IBR methodology establishes a work plan via the PMB and provides a mutual understanding of risks inherent in contractors' performance plans and underlying management control systems to establish an appropriate baseline at contract initiation. Note that the PMB for a *contract* is distinct from the Acquisition Program Baseline, which is the top-level description of *program* cost, schedule, and performance parameters, established pursuant to 10 USC 2435.

The PMB is a total, time-phased budget plan against which contactor performance is measured. Budgets are assigned to the scheduled control accounts and to higher-level contract WBS elements, applicable indirect budgets, and undistributed budgets form the PMB budget plan. The PMB is one of a manager's principal tools for measuring project performance. Properly executed, IBRs are an essential element of a PM's risk management approach to manage the PMB.

The PMB is fundamental to EVM. Early in a contract, it would be unreasonable to expect a detailed control account with work package descriptions and detailed schedules for the manufacture of something that had yet to be designed. But while it is unreasonable that a detailed manufacturing budget and schedule be established for such items, a summary-level planning package serves as a top-level estimate for work that cannot yet be precisely planned and estimated. For near-term and well-defined work, earned value control accounts are established. A control account may have hundreds of work and planning packages. An EVM concept called a "rolling wave" is often used to move work from summary-level planning packages to control accounts and from control account planning packages to control account work packages. The PMB does not include management reserve.

The IBR provides a way to establish realistic PMBs. Realistic PMBs provide a sound basis for measurement of earned value so that PMs have accurate and meaningful information on which to base their decisions. Title 48 of the Code of Federal Regulations (CFR), Parts 234 and 252 require an IBR on any contract that requires the contractor to use an EVMS.

IBRs are initiated as early as practicable, but no later than 180 calendar days after contract award, the exercise of significant contract options, the incorporation of major modifications, or as otherwise agreed upon. While DoD and its industry partners agree on the benefits of completing IBRs as early as possible, exceptional detail is needed for an IBR, which requires time to prepare. Typically, three months are required to establish an initial PMB baseline and

enter it into the company's EVMS tool. Before conducting an IBR to finalize the PMB, best practices dictate that the contractor establish at least two reporting periods of data to assess where the problems are in its EVMS and PMB. This robust methodology helps establish a sound baseline for measurement of contractor performance.

The IBR provides a mutual understanding of the PMB, identifies project risks, establishes project opportunities, and attains agreement on a plan of action to handle the identified risks. The IBR is conducted as a joint assessment by the government PM and the contractor to verify the realism and accuracy of the PMB. This involves verifying the technical content of the baseline and assessing the realism and accuracy of the related resources (performance budget and Integrated Master Schedule [IMS]). Risks generally can be categorized into the following five areas: technical, schedule, cost, resource, and management processes. Early identification of risks or potential problems provides more time for resolution and/or mitigation.

The objective of the IBR is to confirm compliance with the following business rules:

- The technical scope of work is fully included and consistent with authorizing documents;
- Key schedule milestones are identified;
- Supporting schedules reflect a logical flow to accomplish the technical work scope and supporting tasks;
- Resources (budgets, facilities, personnel, skills, etc.) are adequate and available for the assigned tasks;
- Tasks are planned with measurable objectives relative to technical progress;
- Underlying PMB rationales are reasonable; and
- Managers have appropriately implemented required management processes.

Additionally, the IBR process assesses the management reserve with respect to project risk for which the PMB does not account. To evaluate project PMB risks, the IBR process assesses the degree to which the project attains the above objectives. Technical, schedule, cost, resource, and management process risks identified during the IBR are reviewed and are incorporated into the project risk management planning.

In summary, the key benefits of the IBR process are:

- Lays a solid foundation for mutual understanding of project risks;
- Provides management insight into the planning assumptions and resource constraints of the baseline;
- Allows comparison of contractor and DoD expectations so that any differences can be addressed early in the planning phase;

- Provides project management teams with a thorough understanding of the project plan and its risks, allowing early intervention and the application of resources to address project challenges;
- Increases confidence in the project PMB, which provides a powerful, proactive, program management capability to obtain timely and reliable cost and schedule projections;
- Corrects baseline planning errors and omissions;
- Increases understanding of developing variances and improves early warning of significant variances;
- Targets resources to address challenges and mitigate risks;
- Fosters mutual commitment by the joint team to manage to the baseline; and
- Supports establishing more executable contracts.

In addition to the IBR required after contract award, IBRs are also performed at the discretion of the PM or when major events occur within the life of a contract. These events may be a significant shift in the content and/or time-phasing of the PMB, or when new work is added, such as by an option exercise. An IBR should also be conducted whenever a significant change in cost or schedule (over target baseline or over target schedule) is implemented.

Additional, continuing benefits to the PMs, once a PMB has been established and the IBR process has been implemented, include management insight, early warning, and EVMS support:

- The IBR process enables the principles of management by exception and improves problem traceability rather than require continuous oversight of all tasks.
- The analysis of actual costs and accomplishment of schedule milestones enables early indication of potential problems.
- The process supports the EMVS, which enables management to quantify the impact of known problems, measure work accomplished, and obtain realistic estimates at completion.

Once the IBR is completed, emphasis shifts to the management processes. Management processes can indicate the correlation of actual performance with the PMB and enable a continuous, mutual understanding of project risks. Failure to adequately achieve PMB estimates indicates existing or impending problems. Deviations from the PMB will point out the risk areas and issues requiring management attention.

Management processes necessary to support the IBR process include baseline maintenance, risk management, and business processes.

a. Baseline Maintenance Process

The baseline maintenance process maintains the PMB as a current depiction of the plan for accomplishing the remaining work. This process updates the PMB to reflect changes caused by the program dynamics discussed earlier.

b. Risk Management Process

The risk management process documents and classifies risks associated with the PMB. The government and contractor PMs should document active risks from the IBR in risk management planning. Each active risk addressed in risk management planning should be classified based on its probability of occurrence, consequences, handling, and identification of the individuals responsible for the mitigation actions.

c. Business Processes

Other business processes include scheduling, estimate to complete, earned value measurement against the PMB, and managerial analysis. Each of these processes supports the management of the project. Inappropriate or inadequate use of these processes not only may fail to identify project risks, but may actually add risk to the project.

In conclusion, the PMB establishes the contract-level, timed-phased baseline against which contract-level earned value metrics are computed. It establishes the scope, schedule, and budget targets for the planned work under the contract. The IBR is the culminating event of the PMB development process. At this review, the contractor and government PMs agree that they understand the contract requirements and associated risks. To truly manage this risk, the PMB must be a participative, continuous process; work scope must be planned as objective and measurable work packages; and budgets and schedules must be properly integrated, realistic, and achievable. Management processes then support execution according to the PMB.

H. Requirement 8, Training and Qualifications for EVMS Administration and Oversight

Section 887 (a)(8) (as amended by Section 302 of the Weapon Systems Acquisition Reform Act of 2009) requires "a discussion of the manner in which the Department ensures that personnel responsible for administering and overseeing earned value management systems have the training and qualifications needed to perform that responsibility."

1. Method

As stated in Subsection D, above, the DST evaluated the state of the EVM training available within DoD, focusing on answering the following question: Are we providing the right content to the right people at the right time with the best delivery method from the best source? The focus of that evaluation was largely on the EVM curricula and other qualification methods offered by DAU, DoD's enterprise-wide training provider; DCMA, the agency responsible for assessing the efficacy of contractor EVMS; and NGA, an IC Agency that performs its own contractor EVMS

compliance assessments. It also looked at the training provided in a Navy organization that has the responsibility to conduct EVMS surveillance activities for sea-based programs.

2. Findings

A reduction in EVMS training within DoD was an unintended consequence of acquisition reform. The transfer in ownership of the EVMS guidelines from DoD to industry in the mid-1990s resulted in elimination of the Department's principal EVMS surveillance course. The thinking at the time was that, since industry was now responsible for system surveillance, DoD no longer needed to train people to perform this function. This proved to be a faulty supposition because we have found that industry did not adequately perform its system surveillance responsibilities. And, because this training gap exacerbated the challenges faced by DCMA in assuming its role as executive agent for EVMS, DoD fell short in its system oversight responsibilities.

More than a decade passed before the DoD EVM working group established and funded the requirement to reinstitute EVMS training. With the support of USD(AT&L) and DCMA, in 2006 DAU developed and began teaching the new EVMS Validation and Surveillance course. Similarly, in 2008 a new Principles of Schedule Management course, which focused on the scheduling guidelines in ANSI/EIA-748, came to fruition. The good news—approximately 267 students, predominantly from DCMA, have taken the EVMS surveillance course since 2006. The bad news—several offerings of the new scheduling course were cancelled due to a lack of attendees. This can be attributed in large part to the tendency for training to be taken only when it is a requirement associated with career field certification. Neither the EVMS surveillance course nor the scheduling course is currently required for certification in any existing career fields. These career field certification requirements will be reassessed and modified as appropriate to ensure personnel whose jobs require EVMS expertise have the training and qualifications necessary to successfully carry out their responsibilities.

In the performance of DCMA's responsibility to ensure the integrity of DoD supplier EVMS, the DCMA EVM Center's primary focus is EVMS compliance reviews. EVMS compliance reviews ensure that designated supplier EVMS are compliant with the 32 guidelines in ANSI/EIA-748. To that end, it is imperative that the DCMA employees conducting and participating in EVMS compliance reviews are qualified to make compliance evaluation assessments in a controlled, uniform, and standard manner. A progressive training and experience model qualifies all those in lead positions who are making the assessment decisions regarding supplier EVMS compliance. Training requirements for such employees include the EVM courses offered by DAU, computer-based training modules, and internal training provided by DCMA. All EVMS specialists in the DCMA EVM Center must be Level II certified in the business career field at the GS-12 grade, and Level III certified at the GS-13 grade and higher. Classes required outside of the business career field include the EVMS Validation and Surveillance course and the Principles of Schedule Management course. A progressive career path provides employees with a graduated approach that ranges from EVMS specialist to interview lead, area lead (across all organizational areas in the EVMS standard), review assistant, and review deputy, before achieving the expert level of review chief.

DCMA employs a computer-based system—the Civilian Training Management System—to manage training needs and offer courses. The requirements are pulled directly from employees' electronic individual development plans and are used to build classes. Following is a list of classes offered to DCMA employees performing EVMS-related functions.

- EVMS Surveillance
- Basic Scheduling Using Open Plan
- Basic Scheduling Using Primavera
- Contract Performance Report Analysis Using wInsight
- Tripwires Training
- EVMS Training Workshop
- Schedule Risk Assessment Using Risk Plus
- Critical Path Analysis
- 14-Point Assessment.

DCMA's EVM training strategy focuses on honing practical skills, which address cost, schedule, and performance risk from an integrated program perspective.

In addition to its increased emphasis on EVMS training, the DCMA EVM Center has established a Standard Surveillance Operating Manual (SSOM) that the contract management offices, working jointly with contractors and the EVM Center, use for developing and implementing a standard, consistent, risk-based surveillance approach. The EVM Center is developing and maintaining a database for all documentation generated under the SSOM process to enhance its knowledge management capabilities. The EVM Center is also finalizing a Validation Review Operating Manual to provide a consistent, standard approach to conducting validation reviews for contractor EVMS.

In the Naval Sea Systems Command (NAVSEA), SUPSHIP is the contract administration office for contracts at private-sector shipyards and is responsible for shipbuilder EVMS surveillance activities. Training for SUPSHIP personnel is accomplished predominantly through the DAU training curriculum for certification within the business career field. This training includes basic and intermediate earned value analysis as well as other business and cost analysis courses. SUPSHIP personnel responsible for system surveillance activities also have attended the DAU EVMS Validation and Surveillance course. The NAVSEA SUPSHIP management office is considering offering an EVMS Validation and Surveillance course session specifically for SUPSHIP personnel. Feedback from attendees has indicated that, while the EVMS Validation and Surveillance course provides a strong foundation in the EVMS guideline requirements to support initial validation of contractor systems, the training could be improved by providing a more in-depth treatment of system surveillance.

NAVSEA SUPSHIP has also provided on-the-job training experience to its EVM specialists by offering surveillance opportunities at other contractor facilities and supporting DCMA EVMS reviews. To standardize the surveillance process, NAVSEA is developing a standardized EVMS surveillance process that is based on the DCMA SSOM but is tailored to the SUPSHIP organization.

NGA incorporates EVM as a critical element of integrated contract performance management. It supplements the existing DAU courses with EVM training that is specifically tailored to the NGA mission. NGA's EVM training includes both schoolhouse and focused, just-in-time training. In 2006, NGA initiated the Matrix Program to address the need for continuous training for the agency's PMs and contracting officer representatives. Initially there were two EVM-related matrix courses totaling twenty hours. In 2007, the NGA EVM Center of Excellence (COE) completed a study to identify the gap between workforce knowledge, skills and abilities, and job requirements across 14 selected subject areas. The study identified the need for seven additional EVM-related matrix courses. In addition to the matrix courses, the COE also provides just-in-time training and consulting support for NGA program offices. The just-in-time training is usually provided in conjunction with critical acquisition milestones, such as the Contract Implementation Review and IBR. Course offerings include:

- Principles of EVM
- Baseline Development and Maintenance
- Scheduling for Managers
- 32 EVMS Guidelines
- Estimate at Completion
- wInsight for Managers.

Curriculum content for the EVM matrix courses and just-in-time training is managed and taught by subject-matter experts in the NGA EVM COE.

While the development of two new EVMS courses by DAU and the in-house training and other efforts being instituted by DCMA, the Navy, and NGA are significant steps forward, we plan to enhance DoD EVM training to ensure personnel in DoD have the right training and qualifications to perform EVMS surveillance and oversight functions.

I. Requirement 9, Mechanisms to Ensure EVMS Compliance

Section 887 (a) (9) (as amended by Section 302 of the Weapon Systems Acquisition Reform Act of 2009) calls for "a discussion of mechanisms to ensure that contractors establish and use approved earned value management systems, including mechanisms such as the consideration of the quality of contractor earned value management performance in past performance evaluations."

1. Method

The DST evaluated the mechanisms to ensure DoD contractors establish and use approved EVMS, focusing on answering the following questions: (1) Do we have mechanisms to ensure EVMS compliance and appropriate use for management purposes? (2) How do we capture and consider contractor EVMS performance in past performance evaluations? The focus of this evaluation was largely based on a sampling among the Military Departments and Agencies to identify and assess mechanisms currently in place.

2. Findings

a. Mechanisms for Ensuring Contractors Establish and Use Approved EVMS

i. Initial EVMS Implementation

DCMA evaluates contractor EVMS and determines whether they are compliant with ANSI/EIA-748. DoD Agencies that are part of the Intelligence Community also assess the compliance of contractor EVMS for contracts under their cognizance. SUPSHIP conducts surveillance of contractor EVMS for contracts under its cognizance. In accordance with DoDI 5000.02, contractors with cost or incentive contracts valued at or over $50 million must have an EVMS that has been validated by DoD as being compliant with the guidelines in ANSI/EIA-748.

ii. Continuous EVMS Surveillance

After a system's initial acceptance, compliance reviews verify that the contractor's accepted system complies with the DoD criteria, in the context of a particular contract. Surveillance activities are conducted on a recurring basis to verify ongoing system compliance. A rigorous surveillance program monitors potential areas of noncompliance and provides the government with the required insights and data access points to perform specific operations to test the quality of contractor EVMS implementation. With the cooperation and commitment of stakeholders and contractors, DoD ensures that each contractor maintains a compliant EVMS.

iii. Consequences of Noncompliant EVMS

If a contractor fails either the initial EVMS implementation review or a continuing surveillance review, a corrective action plan is implemented to address discrepancies within a specific period. If the contractor fails to correct the deficiencies during the required timeframe, the cognizant agency (DCMA, SUPSHIP, or the IC Agency) recommends contractual remedies to the Contracting Officer. Contractual remedies may consist of withholding of progress payments or fees pending correction of the deficiencies. The cognizant agency may also issue a letter of EVMS noncompliance, with the effect that the contractor must, when making a proposal for a new contract, disclose that its EVMS has been determined to be noncompliant with ANSI/EIA-748. The cognizant agency may also revoke a previously granted EVMS validation, which requires the contractor to re-start the EVMS validation process with an initial EVMS implementation review.

Failure to comply with the government surveillance program will jeopardize the contractor's compliant status and overall credibility. Additionally, noncompliance can result in increased implementation costs and loss of confidence in system data for decision-making. The enforcement of contractor compliance is designed to minimize risk to the government by providing reliable performance information for decision-making.

While DoD performs various periodic assessments of contractor EVMS and communicates with each contractor regarding the findings of compliance reviews, the ultimate responsibility for maintaining a compliant and effective EVMS lies with the contractor.

b. Quality of Contractor EVMS Performance in Past Performance Evaluations

Title 48 of the CFR, Part 15, requires that past performance be evaluated in most source selections for negotiated competitive acquisitions expected to exceed the simplified acquisition threshold.

As part of contractor proposal evaluations, the Contractor Performance Assessment Rating System (CPARS) plays a major role in the overall assessment of the contractor's past performance. Each assessment is based on objective facts and supported by program and contract management data, such as contract performance reports, customer comments, quality reviews, technical interchange meetings, and earned contract incentives. The DoD CPARS Policy Guide requires collection of past performance data on contractor program management, including its EVMS and an assessment of the contractor's timely resolution of any CAP. Via the CPARS and other data sources, contractor performance with respect to EVM is routinely considered in source selections for contracts with EVMS requirements.

J. Requirement 10, Recommendations for Improving EVM and Its Implementation within DoD

Section 887 (a) (10) (as amended by Section 302 of the Weapon Systems Acquisition Reform Act of 2009) calls for "recommendations for improving earned value management and its implementation within the Department, including (A) a discussion of the merits of possible alternatives, and (B) a plan for implementing any improvements the Secretary determines to be appropriate."

1. Method

Insights gained through the DST's analyses led the team to make several recommendations for Departmental action.

2. Findings

The DST's recommendations fall into three general categories:

1. Ongoing initiatives

2. Proposals for new initiatives
3. Areas for further analysis.

For example, recommendations in the ongoing initiatives category include the following:

- Finalize and publish the DoD Over Target Baseline and Over Target Schedule Handbook
- Publish a DoD Guide to Analysis of Earned Value Management and Cost Data
- Update the DoD Earned Value Management Implementation Guide (EVMIG) and improve configuration control of the EVMIG
- Improve compliance with DoD Central Repository requirements for delivery of timely, complete, and accurate EVM data
- Continue development of EVM diagnostics tools to enable Program Managers and others with responsibility for oversight of acquisition programs to interpret and apply EVM information in acquisition decision-making
- Update the existing Work Breakdown Structure Handbook and convert it to a Military Standard to facilitate cost performance comparisons of similar contracts and programs

The DST recommendations will be submitted to the USD(AT&L) for approval. Each recommendation will be assigned to an action office led by a Senior Executive who will develop resource requirements and a time-phased implementation plan. The EVM DST Executive Steering Committee will ensure progress on these initiatives by monthly meetings to review status of implementation of the recommendations and quarterly status reports to the USD(AT&L).

None of the DST recommendations requires new statutory authorities or other Congressional action.

3. Merits of Possible Alternatives

As explained in Section II.B of this report, DoD considers EVM to be the best option available to the program management community and senior leaders. The Department's rationale is that EVM holds all parties accountable for the effective management of large and complex acquisitions. The Department has not identified any performance measurement and management alternative to EVM, but will continue to improve EVM throughout the Department by implementing the DST's recommendations.

Appendix A. Department of Defense Earned Value Management Policy Memorandums

This appendix contains recent EVM-related policy memorandums issued by the Department:

- USD(AT&L) memorandum, "Standardization of Work Breakdown Structures to Support Acquisition Program Management," January 2009.
- Director, DPAP memorandum, "Earned Value Management Requirements and Reporting," August 2008.
- USD(AT&L) memorandum, "Implementation of the Central Repository System," July 2007.
- USD(AT&L) memorandum, "Use of Earned Value Management (EVM) in the Department of Defense," July 2007.
- USD(AT&L) memorandum, "Defense Contract Management Agency's Earned Value Management (EVM) Roles and Responsibilities," April 2007.

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ACQUISITION,
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JAN 0 9 2009

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Standardization of Work Breakdown Structures to Support Acquisition Program Management

Effective program management requires a comprehensive and consistent structure that addresses all programmatic needs. The work breakdown structure (WBS) provides this essential framework for communicating information about program requirements and program performance. The Department of Defense (DoD) needs standard data groupings to effectively plan and execute programs and assess progress in meeting stated objectives.

The WBS Handbook (MIL-HDBK-881A) prescribes a standard WBS for each major commodity and serves as the cornerstone for much of DoD's program management and contract data collection and analysis efforts. While the Handbook has proven to be useful in implementing the WBS, its effects have been somewhat limited because of its designation as guidance only. Consequently, many program offices have deviated from the standard work breakdown structures contained in the WBS Handbook in both their program and contract documents. This lack of standardization has resulted in several significant problems, such as: (1) poorly constructed work breakdown structures that impede effective program management practices; (2) contractors having to maintain two work breakdown structures; (3) difficulty in understanding and comparing contractor proposals; (4) inconsistent contract data requirements lists; (5) difficulty in reconciling data submissions; and (6) more time consuming, less accurate data collection and analysis. These problems often result in increased costs for both the government and contractor.

We are addressing these problems in two ways. First, we will convert the WBS Handbook to a Military Standard, thereby rendering its requirements mandatory. Second, we have begun the process of updating the work breakdown structures currently contained in the Handbook to reflect changes in the acquisition environment since the last release in 2005. This effort will involve all program management disciplines, including systems engineering, cost analysis, earned value management, business management, etc. The process will culminate in a new WBS Standard that is expected to be published some time next year.

In the interim, all contracts awarded after April 2005 that are subject to the earned value management (EVM) policy prescribed in USD(AT&L) memorandum, Revision to DoD Earned Value Management Policy, dated March 7, 2005, and subsequently included in DoD Instruction 5000.02, dated December 2, 2008, will continue to implement standard work breakdown structures as prescribed in the existing WBS Handbook. DoD EVM policy requires a common, product-oriented WBS that follows the Handbook.

My points of contact for this matter are Ms. Debbie Tomsic, ARA, at 703-695-0707 or deborah.tomsic@osd.mil and Dr. Ronald Lile, CAIG, at 703-601-4875 or ronald.lile@osd.mil.

John J. Young, Jr.

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MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY
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ASSISTANT SECRETARY OF THE NAVY
(RESEARCH, DEVELOPMENT AND ACQUISITION)
ASSISTANT SECRETARY OF THE AIR FORCE
(ACQUISITION)
DIRECTORS OF DEFENSE AGENCIES

SUBJECT: Earned Value Management Requirements and Reporting

Defense Federal Acquisition Regulation Supplement (DFARS) Subpart 234.2 and DoD Instruction 5000.2, Operation of the Defense Acquisition System, prescribe mandatory Earned Value Management (EVM) requirements and reporting for cost and incentive contracts valued at or greater than $20 million. EVM is one of DoD's and industry's most useful program management tools, providing early warning of potential contract cost and schedule performance problems. To be effective, EVM must be implemented in a disciplined manner consistent with the EVM System (EVMS) guidelines in the American National Standards Institute/Electronic Industries Alliance Standard 748 (ANSI/EIA-748).

The Director, Acquisition Resources and Analysis (ARA), has primary responsibility for establishing and maintaining EVM policy. The Director, Defense Contract Management Agency (DCMA), has primary responsibility for ensuring consistent application and interpretation of the EVMS guidelines and conducting contractor EVMS reviews to verify initial and ongoing system compliance. Both ARA and DCMA have identified several EVM implementation issues on DoD contracts. These include: (1) failing to include the applicable EVM requirements in contracts and solicitations, (2) incorrectly tailoring the data item descriptions for the Contract Performance Report and the Integrated Master Schedule, (3) inappropriately modifying EVM contract requirements, (4) specifying contract requirements in special provisions and/or statements of work that are not consistent with the EVM policy and EVMS guidelines, and (5) using contract incentives that counter EVM's objectives.

It is imperative that all contracts use the appropriate solicitation provision and contract clause, as prescribed at DFARS 234.203. While program managers have ultimate responsibility for ensuring the EVM requirements are correctly included in statements of work and contract data requirements lists, contracting officers can help improve compliance by working more closely with program managers and EVM subject matter experts throughout the contracting process. Together they must ensure that the EVM requirements are appropriately identified and incorporated into solicitations and contracts, and that they are executed properly. Contracting officers also should consult with EVM subject matter experts during the source selection process and maximize cross-functional collaboration in pre- and post-award conferences. In addition, contracting officers must implement appropriate remedial actions in the event of contractor non-compliance.

To assist contracting officers and program managers, DoD has developed an EVM Contract Requirements Checklist, which is available on the OSD EVM web site (http://www.acq.osd.mil/pm/). The web site also contains links to all of the applicable EVM policy and guidance documents, to include the new DFARS clauses that were published in the *Federal Register* in April 2008.

Please refer any questions or comments to Mr. Michael Pelkey of my staff (703-614-1253, michael.pelkey@osd.mil) or Ms. Debbie Tomsic, ARA (703-695-0707, deborah.tomsic@osd.mil).

Shay D. Assad
Director, Defense Procurement,
Acquisition Policy and
Strategic Sourcing

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JUL 1 1 2007

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Implementation of the Central Repository System

The following is an update on the status of the automated Central Repository (CR) pilot and to announce full implementation on all Earned Value Management (EVM) reports for Acquisition Category (ACAT) I programs.

The memorandum dated August 25, 2006, "Improving Acquisition Execution Situational Awareness Initiatives," authorized the test and evaluation of the CR concept by designating nine pilot programs to submit Contract Performance Reports (CPRs) to the CR repository maintained by the Defense Cost and Resource Center. The Contract Funds Status Report (CFSR) was subsequently added as a pilot submission item.

The CR pilot results provide the foundation for full implementation. First, study participants have strongly supported the CR efforts through complete and timely electronic reporting, consistent data review, business rule development, and process improvement recommendations. Second, the pilot demonstrated that CPR data can be securely controlled and warehoused while providing ready and secure access to authorized users. Third, the pilot system, thus far, has been implemented with minimum cost and disruption to government program managers and reporting contractors. Fourth, the transparency and availability of more timely and detailed data is a good and necessary first step in improving acquisition execution situational awareness.

Based on the success of the pilot project, the Defense enterprise is directed to implement the CR on all applicable ACAT I programs. This will be accomplished in a phased approach. Phase 1 will focus on completing the pilot project as planned to refine and finalize policies, procedures, and business rules. Phase 2 will involve systematically adding the remaining ACAT ID and IC programs to the CR system. Existing ACAT IA programs will be added in a follow-on phase. The CR study team will work directly with the applicable acquisition representatives and program offices to add approximately 10 programs per month starting with rotary wing aircraft, ships/submarines, and space systems. The goal is to have the ACAT ID and IC programs operational in the CR system effective with their January 2008 submissions of December data. The list of programs with the corresponding implementation schedule is attached.

In addition, effective immediately, all new ACAT I programs will structure their contracts with EVM requirements so that the addressee in the Contract Data Requirements List for the CPR, CFSR, and Integrated Master Schedule (IMS) data is the CR. The CR study team will provide, through the applicable acquisition representatives, detailed instructions on designating the CR as the addressee for the data and obtaining access to the CR.

The following reports will be included in the CR system: CPR, CFSR, and IMS. The CPR shall be submitted to the CR monthly, and the CFSR shall be submitted to the CR with the same frequency that the contract requires its submission from the contractor(s) (typically monthly or quarterly). Although the goal is to obtain the IMS monthly, program offices are directed to provide quarterly submissions to the CR until the file size and format issues are satisfactorily resolved. The CR study team has also been tasked to consider revising the IMS data item description to include the requirement for a summary-level report that is compatible with the CPR and its related analysis.

The Defense Contract Management Agency (DCMA), in coordination with industry, has developed and piloted XML standards that are awaiting approval by the United Nations Center for Trade Facilitation and eBusiness. Upon approval, program offices are directed to incorporate these standards into the contract reporting requirements for the CPR, CFSR, and IMS. The effective date will be left to the discretion of the Director, Acquisition Resources and Analysis, based upon the availability of software to prepare and read the new XML reporting formats. In the meantime, the CR study team will provide specific instructions regarding the required form factors. DCMA will monitor data quality and oversee the transition to the XML standards.

Your participation in the CR test is appreciated. The collective government/industry community will benefit by continuing to work together on initiatives of mutual benefit such as this.

My points of contact are Dr. Ron Lile, at 703-601-4850, Ronald.Lile@osd.mil, and Ms. Debbie Tomsic, at 703-695-0707, Deborah.Tomsic@osd.mil.

Kenneth J. Krieg for

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Planned CR Expansion
Designated Programs

Current Pilot	July 2007 -- Special Case	September 2007 -- Rotary Aircraft	October 2007 -- Ships and Submarines	November 2007 -- Space, Missiles, and Munitions	December 2007 -- Aircraft and C3I	January 2008 -- Remaining ACAT ID and IC
JLENS	EFV	Blackhawk Upgrade (UH-60M)	Cobra Judy Replacement	AEHF	ADS (AN/WQR-3)	STRYKER
ARH		CH-47F	CVN 21	GBS	CEC	CHEM DEMIL-ACWA
SM-6		Longbow Apache	CVN 68	NAVSTAR GPS	FBCB2	CHEM DEMIL-CMA
Global Hawk (RQ-4A/B)		AB3 (Apache Block III)	DDG 1000 (DD(X))	NPOESS	JTRS GMR (CLUSTER 1)	CHEM DEMIL CMA NEWPORT
P-8A (MMA)		CH-53K (HLR)	DDG 51	Minuteman III GRP	JTRS HMS (CLUSTER 5)	DIMHRS (Pers/Pay)
Land Warrior		MH-60S	LCS	Minuteman III PRP	JTRS JOINT WAVEFORM	FCS
SBIRS High		VH-71	LHA Replacement	AGM-88E AARGM	MIDS	NMT
MUOS		V-22	LPD 17	AIM-9X	MP RTIP	EA-18G
C-17A			T-AKE	AMRAAM	MPS	F/A-18E/F
			SSGN (Ohio Class)	GMLRS	F-35 (JSF)	C-130J
			SSN 774 (Virginia Class)	PATRIOT PAC-3	E-2D AHE	C-130 AMP*
				PATRIOT/MEADS CAP	B-2 RMP	
				EXCALIBUR	C-5 RERP	
				JASSM	WIN-T*	

* Month indicated or earlier pending approval of restructured Acquisition Program Baseline.

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JUL 0 3 2007

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Use of Earned Value Management (EVM) in the Department of Defense

EVM is considered by many in the project management community to be the best option currently available for holding all parties accountable for the effective management of large and complex projects. EVM provides a disciplined approach to managing projects successfully through the use of an integrated system to plan and control authorized work to achieve cost, schedule, and performance objectives. The fidelity of the information produced by the EVM System (EVMS) is critical to providing an objective assessment of a program's performance from which well-informed management decisions can be made. Moreover, EVM is not just a cost report; it is a tool to help program managers and their team members operate more effectively in managing their programs.

Despite the proven value of EVM, we are not maximizing its benefits in managing defense programs. The policy requirements for applying EVM to DoD contracts are well documented. However, the level of acceptance and use of EVM in program management Department-wide is insufficient, especially given the number of major defense programs experiencing execution problems. Several unfavorable findings from recent audits further indicate that EVM is not serving its intended function in the internal control process.

The most important contributor to the successful implementation of EVM is strong and visible leadership support. Therefore, I challenge leaders at all levels in the Department – from the Component Acquisition Executives, System Commanders, and Program Executive Officers to the individual program managers – to focus personal attention on setting expectations for the use of EVM, and following through with appropriate implementation, utilization, and support for remedial actions in the event of non-compliance with the EVMS guidelines.

We are committed to resolving the systemic, DoD-wide weaknesses with the help of the Defense Contract Management Agency (DCMA) and the support of the DoD Components. As a first step, to ensure clear delineation of authority and accountability for monitoring the use of EVM, attached are the roles and responsibilities of the key players involved in the implementation of EVM in the Department.

As the next step, the Deputy Under Secretary of Defense for Acquisition and Technology and the Director, Acquisition Resources and Analysis (ARA), will work with the applicable OSD offices, DCMA, and the DoD Components to assess the current EVM policy and practices, to include the state of compliance and enforcement. They will recommend modifications to address recent audit findings and any other identified deficiencies. This initiative will be worked through the DoD EVM working group, which is led by ARA, with the full and active involvement of the Components.

Correctly imposing the EVM requirements on contract and establishing the baseline are critical prerequisites to the successful implementation of EVM. Consequently, the DoD Components should integrate EVM into pre- and post-award planning activities and involve the functional experts from the program management, systems engineering, contracting, EVM, cost estimating, and other relevant communities in that process. In addition, the Components should establish and maintain realistic, executable performance measurement baselines against which to measure contract performance.

Each DoD Component will be accountable for the effective implementation of EVM on its programs, to include supporting DCMA on EVMS reviews and surveillance activities. The Components will be accountable for conducting Integrated Baseline Reviews and complying with the EVM reporting requirements, to include the Contract Performance Report and the Integrated Master Schedule. Each Component will flow the EVM roles and responsibilities and other DoD EVM policy and guidance down to its subordinate organizations by codifying them in Component policies and procedures. In addition, all DoD organizations will establish and maintain centers of EVM expertise and employ the resources and capabilities needed to successfully institutionalize the proper use of EVM to manage – or oversee the management of – the programs under their cognizance. The Components, in conjunction with the Defense Acquisition University, will ensure appropriately focused EVM training is provided to program managers, contracting officials, and EVM practitioners.

Finally, within 90 days, the Component Acquisition Executives will present a status update on their efforts to promulgate the attached EVM roles and responsibilities and improve the implementation of EVM within their organizations.

My point of contact is Ms. Debbie Tomsic, ARA, Acquisition Management, 703-695-0707.

Kenneth J. Krieg

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CHAIRMAN, COST ANALYSIS IMPROVEMENT GROUP

July 3, 2007

Department of Defense Earned Value Management Roles and Responsibilities

Office of the Under Secretary of Defense (Acquisition, Technology and Logistics)

- Develop, publish, and maintain Department of Defense (DoD) policy and guidance on Earned Value Management (EVM). Coordinate policy changes with affected DoD stakeholder organizations prior to publication.
- Function as the Office of the Secretary of Defense (OSD) subject matter expert on the DoD EVM policy and guidance.
- Provide advice and assistance on interpreting and implementing the DoD EVM policy and guidance.
- Monitor EVM-related regulatory and statutory requirements that are imposed government-wide to ensure DoD compliance.
- Prepare and process changes to the Defense Federal Acquisition Regulation Supplement to implement EVM-related regulatory and statutory requirements or policy changes. Assist in preparing and processing changes to the Federal Acquisition Regulation.
- Develop and implement management accountability standards for compliance with the DoD EVM policy and guidance.
- Develop and execute uniform actions to enforce compliance with the DoD EVM policy and guidance.
- Oversee the Defense Contract Management Agency's (DCMA) enforcement of Earned Value Management System (EVMS) compliance with the guidelines in the American National Standards Institute/Electronic Industries Alliance Standard 748, *Earned Value Management Systems* (ANSI/EIA-748).
- In conjunction with DCMA and other DoD stakeholder organizations, monitor changes to ANSI/EIA-748 and the related industry guides and, if appropriate, secure and communicate DoD's recognition of the documents.
- Lead EVM working groups, to include an internal DoD only working group and a joint DoD/industry working group. Host and facilitate working group meetings and other EVM-related discussion forums.
- Function as the principal DoD interface point with external entities (industry, other Federal government agencies, professional associations, allied nation governments, etc.) on EVM-related matters.

- Represent OSD and speak on behalf of DoD at conferences, meetings, and other EVM-related gatherings.

- Develop and maintain the Defense Acquisition Management Information Retrieval (DAMIR) system and other relevant data systems and tools to provide access to EVM information DoD-wide.

- Develop tools to assist OSD in analyzing EVM information for decision making purposes. Make applicable tools available for use DoD-wide.

- Use available EVM information in assessing the status of program/contract cost and schedule performance in the OSD oversight and management processes.

- Conduct information and education sessions on the EVM policy and guidance.

- Monitor training needs and work with the Defense Acquisition University (DAU) and other DoD stakeholder organizations to develop, field, and maintain new and modified course curricula on EVM theory and policy. With DAU support, lead the EVM Functional Integrated Process Team.

- Integrate EVM-related activities and initiatives within OSD and coordinate with affected stakeholder organizations.

- Maintain the OSD EVM web site.

- Sponsor EVM-related projects and studies.

Defense Contract Management Agency

- Function as the DoD subject matter expert for EVMS.

- Ensure the integrity of prime and sub-tier supplier (herein referred to as "supplier") EVMS and promote management system effectiveness.

- Conduct EVMS reviews (initial validation reviews, post acceptance reviews, and reviews for cause) to verify initial and continuing compliance of supplier management systems with the guidelines in ANSI/EIA-748. Formally accept (validate) compliant EVMS on behalf of DoD.

- Review EVMS plans to determine initial and continuing compliance of supplier management systems with ANSI/EIA-748.

- Conduct periodic surveillance of EVMS to determine initial and continuing compliance of supplier management systems with ANSI/EIA-748.

July 3, 2007

- Ensure that the EVMS requirements are flowed down to sub-tier suppliers when applicable.
- Check data from supplier cost and schedule reports to assess the capability of the EVMS.
- Employ remedies (in coordination with the procuring contracting officer), as appropriate, for supplier EVMS noncompliance with ANSI/EIA-748.
- Determine when a supplier EVMS validation should be suspended or withdrawn. Provide contractual notification to the procuring activity.
- Coordinate proposed actions and the status of EVMS validation suspensions/withdrawals with the supplier; notify procuring activity of status on a recurring basis.
- Assess and verify supplier progress in implementing the corrective action plans to determine when all of the EVMS deficiencies have been successfully corrected. Continue to monitor EVMS application through spot checks, sample data traces, and random interviews, as appropriate.
- Develop, implement, and utilize an EVMS corrective action request status tracking system.
- Determine compliance with ANSI/EIA-748 for applicable contracts and agreements in accordance with the DoD EVM policy and guidance.
- Resolve differences between DoD and other government entities, as appropriate, and industry concerning interpretation of EVMS implementation.
- Provide advice and assistance on interpreting and implementing the DoD EVM policy and guidance.
- Enforce supplier EVMS compliance as required by the DoD EVM policy and guidance.
- Develop, publish, and maintain the Earned Value Management Implementation Guide (EVMIG) on behalf of DoD. Coordinate changes with OSD and affected DoD stakeholder organizations prior to publication.
- In conjunction with OSD and other DoD stakeholder organizations, monitor changes to ANSI/EIA-748 and the related industry guides and, if appropriate, make recommendations to OSD regarding DoD's recognition of the documents.
- Actively participate on the EVM working groups, to include the internal DoD only working group and the joint DoD/industry working group.
- Interface with external entities (industry, other Federal government agencies, allied nation governments, etc.) on EVMS-related matters.

- Represent DCMA and speak on behalf of DoD at conferences, meetings, and other EVM-related gatherings.

- Develop, monitor, and report EVM metrics that provide insight into program/contract cost and schedule performance issues. Provide metrics tool kit to OSD and DoD Components, as requested.

- Develop, implement, and maintain training materials, user manuals, etc. pertaining to the EVMS validation and oversight process. Conduct in-house training, as necessary. Contribute to the development and modification of DAU course curricula.

- Establish memorandums of agreement with the procuring activities.

- Provide EVM analyses and reports to DoD Components and procuring activities, as appropriate.

- Support the DoD Components in executing the Integrated Baseline Review (IBR) process, as appropriate.

- Support the OSD Nunn-McCurdy certification process. Assist the DoD Components in identifying programs at risk for Nunn-McCurdy breaches.

- Integrate EVM-related activities and initiatives within DCMA and coordinate with affected stakeholder organizations.

- Maintain and publish the list of suppliers with validated EVMS.

- Participate in OSD sponsored EVM-related projects and studies.

Notes:
1. DCMA performs the above functions for the DoD Components, except those Components that are also part of the Intelligence Community and are excluded from the requirement to delegate EVMS authorities to DCMA.
2. The Navy Supervisor of Shipbuilding (SUPSHIP) has the authority to conduct EVMS surveillance activities, and the responsibility to coordinate with DCMA, for the contracts under his cognizance.

Defense Contract Audit Agency

- Support the following EVMS surveillance activities:
  - Periodic reviews of supplier accounting systems to assess compliance with the EVMS requirements and contract provisions, including verification of consistency with related budgeting and work authorization systems.
  - Participating in EVMS reviews and system surveillance activities.

- Periodic reviews of contract performance reports to determine the accuracy and reliability of the financial data generated from the supplier's systems.
- Reporting any significant unresolved deficiencies to the DCMA EVMS Specialist.
- Coordinating the appropriate EVMS surveillance requirements into routine Defense Contract Audit Agency (DCAA) audit programs and procedures with the DCMA EVM Center.
- Advising the DCMA EVMS Specialist regarding DCAA surveys of contractor systems and other audits, which may bear on EVMS acceptability or surveillance.

- Perform the following EVM-related activities:
  - Ensuring compliance with the DoD EVM policy and guidance through the performance of surveillance activities.
  - Developing and issuing supplemental guidance to ensure adequate DCAA surveillance of suppliers' EVMS.
  - Participating on FAR and DFARS committees to develop or revise regulatory and statutory requirements or policy changes.
  - Participating on the EVM working groups, to include the internal DoD only working group and the joint DoD/industry working group.
  - Representing DCAA and speak at conferences, meetings, and other EVM-related gatherings.
  - Identifying, developing, and managing EVM-related training for DCAA, as necessary.

DoD Components/Procuring Activities

- Establish and maintain compliance with the DoD EVM policy and guidance.
  - Develop and issue EVM policy and guidance, as required, to supplement that established by DoD.
  - Direct the implementation and use of EVM by Program Executive Officers and Program Managers.
  - Provide recommendations to OSD published policy and guidance, to include the EVMIG.
  - Develop and execute procedures for consistent oversight and enforcement actions for noncompliance with EVM policy.

- Establish and maintain EVM focal point(s) with subject matter expertise for policy interpretation, implementation, compliance, oversight, and enforcement.
  - Provide advice and assistance on interpreting and implementing the DoD and supplemental policy and guidance.
  - Participate on the EVM working groups, to include the internal DoD only working group and the joint DoD/industry working group.
  - Represent the component at DoD and component acquisition community and industry forums to address EVM issues of mutual interest and concern.
  - Identify, develop, and manage EVM training necessary for the development of organizational expertise.

- Establish processes to utilize EVMS outputs to support proactive decision making and accountability at all levels.
    - Include appropriate and comprehensive EVM requirements in the acquisition planning documents, solicitations, and contracts in accordance with policy and guidance.
    - Integrate EVM contract requirements and EVM implementation discussions into the pre- and post-award conferences.
    - Coordinate memorandums of agreement with DCMA and DCAA.
    - Coordinate requests for supplier EVMS reviews and surveillance activities with DCMA. Support DCMA on EVMS reviews and surveillance activities.
    - Execute and support the IBR process.
    - Provide independent assessments of supplier performance measurement data.
    - Provide, maintain, and support data systems and standardized metrics.

- Develop EVM desk top procedures/toolkits (requirements, analysis, estimates at completion, IBR, integrated master schedule, etc.) for consistency of requirements, reviews, and analysis.

Notes:

1. DoD Components in the Intelligence Community are exempted from delegating EVMS authorities to DCMA.
2. The Navy Supervisor of Shipbuilding (SUPSHIP) has the authority to conduct EVMS surveillance activities, and the responsibility to coordinate with DCMA, for the contracts under his cognizance.

THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

ACQUISITION,
TECHNOLOGY
AND LOGISTICS

APR 2 3 2007

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS,
ATTN: ACQUISITION EXECUTIVES
COMMANDER, U.S. SPECIAL OPERATIONS COMMAND
DIRECTOR, DEFENSE CONTRACT MANAGEMENT AGENCY
DIRECTOR, DEFENSE CONTRACT AUDIT AGENCY
DIRECTOR, DEFENSE LOGISTICS AGENCY
DIRECTOR, DEFENSE INTELLIGENCE AGENCY
DIRECTOR, DEFENSE THREAT REDUCTION AGENCY
DIRECTOR, MISSILE DEFENSE AGENCY
DIRECTOR, DEFENSE ADVANCED RESEARCH
PROJECTS AGENCY
DIRECTOR, NATIONAL SECURITY AGENCY

SUBJECT: Defense Contract Management Agency's Earned Value Management (EVM) Roles and Responsibilities

Today's DoD acquisition environment demands the use of EVM as an objective measure of a program's performance from which informed management decisions can be made.

In the mid-1990s, the then Under Secretary of Defense for Acquisition and Technology designated the Defense Contract Management Agency (DCMA) as the DoD agency responsible for ensuring consistent application and interpretation of the Earned Value Management System (EVMS) guidelines and conducting all contractor management systems reviews to verify initial and ongoing compliance. I continue to recognize and support DCMA's role and have directed my staff to work with DCMA to formalize its designation as the Department's Executive Agent for EVMS as delineated in DoD Directive 5101.1, "DoD Executive Agent."

In addition, I consider each DoD Component accountable for the effective implementation of EVM on its contracts. I also consider each Component accountable for timely requests to DCMA for EVMS compliance reviews and for ensuring ongoing surveillance by DCMA. Finally, I consider each Component accountable for complying with the DoD EVM reporting requirements.

Kenneth J. Krieg

cc:
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
DEPUTY UNDER SECRETARY OF DEFENSE (ACQUISITION AND TECHNOLOGY)
ASSISTANT SECRETARY OF DEFENSE (NETWORKS AND INFORMATION INTEGRATION)
ASSISTANT TO THE SECRETARY OF DEFENSE (NUCLEAR AND CHEMICAL AND BIOLOGICAL DEFENSE)
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
DIRECTOR, PROGRAM ANALYSIS AND EVALUATION
DIRECTOR, OPERATIONAL TEST AND EVALUATION
DIRECTOR, ADMINISTRATION AND MANAGEMENT
DIRECTOR, NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY
DIRECTOR, NATIONAL RECONNAISSANCE OFFICE
DIRECTOR, ACQUISITION RESOURCES AND ANALYSIS
DIRECTOR, PORTFOLIO SYSTEMS ACQUISITION
DIRECTOR, DEFENSE PROCUREMENT AND ACQUISITION POLICY
DIRECTOR, SYSTEMS AND SOFTWARE ENGINEERING
PRESIDENT, DEFENSE ACQUISITION UNIVERSITY
CHAIRMAN, COST ANALYSIS IMPROVEMENT GROUP

Appendix B. Department of Defense Earned Value Management Defense Support Team

On January 24, 2009, USD(AT&L) established a DST to systematically address the implementation of EVM in the Department. DSTs are made up of technical experts to address the Department's toughest program technical issues. USD(AT&L) uses such teams to resolve emergent problems and help the Department successfully execute tough programs before problems develop.

The DUSD(A&T) is the Chairman of the DST, which includes senior-level representatives from USD(AT&L), the Military Departments, and Defense Agencies. The DST has made recommendations for improvement of the Department's policies and procedures regarding its use of EVM, and will oversee the implementation of those recommendations, as directed by USD(AT&L).

This appendix contains the memorandum establishing the DST as well as the EVM DST charter.

A. Memorandum

THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

ACQUISITION, TECHNOLOGY AND LOGISTICS

JAN 24 2009

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
ASSISTANT SECRETARIES OF DEFENSE
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
DIRECTOR, OPERATIONAL TEST AND EVALUATION
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE
ASSISTANTS TO THE SECRETARY OF DEFENSE
DIRECTOR, PROGRAM ANALYSIS AND EVALUATION
DIRECTOR, NET ASSESSMENT
DIRECTORS OF THE DEFENSE AGENCIES
DIRECTORS OF THE DOD FIELD ACTIVITIES

SUBJECT: Earned Value Management Systems Performance, Oversight and Governance

Effective immediately, the Deputy Under Secretary of Defense for Acquisition and Technology (DUSD(A&T)) will provide the single voice and accountability for earned value management systems performance oversight and governance. The Defense Contract Management Agency (DCMA) will remain the Executive Agent for Earned Value, reporting to the DUSD(A&T). Acquisition and Resource Analysis within AT&L will continue to be responsible for the data aspects, including data policy, of EVMS and to be the functional leader for the Business, Cost Estimating and Financial Management (BCEFM) career field.

Primary earned value management acquisition and procurement policy matters will be the responsibility of the Deputy Under Secretary of Defense (Acquisition & Technology). Most elements of AT&L rely on EVMS systems, and all stakeholders will continue to participate and represent their EVMS needs.

A Defense Support Team (DST), chaired by DPAP and comprising senior-level (SES/GOFO) representatives from OUSD(AT&L), DCMA, DAU, and the Military Departments will be immediately established. It will systematically address and provide recommendations to revamp where necessary the earned value management system from requirements through implementation, to include oversight and governance as well as contractual remedies for lack of earned value compliance. The first DST report to the USD(AT&L) will be due by February 20, 2009.

My point of contact is Colonel Richard Hoeferkamp, ODUSD(A&T), at 703-571-9020.

John J. Young, Jr.

cc:
SAEs
Director, ARA

SEC. 887. REPORT ON THE IMPLEMENTATION OF EARNED VALUE MANAGEMENT AT THE DEPARTMENT OF DEFENSE.

(a) In General- The Secretary of Defense shall prepare a report on the implementation by the Department of Defense of earned value management. The report shall include, at a minimum, the following:

(1) A discussion of the regulations and guidance of the Department applicable to the use and implementation of earned value management.

(2) A discussion of the relative value of earned value management as a tool for program managers and senior Department officials.

(3) A discussion of specific challenges the Department faces in successfully using earned value management because of the nature of the culture, history, systems, and activities of the Department, particularly with regard to requirements and funding instability.

(4) A discussion of the methodology of the Department for earned value management implementation, including data quality issues, training, and information technology systems used to integrate and transmit earned value management data.

(5) An evaluation of the accuracy of the earned value management data provided by vendors to the Federal Government concerning acquisition categories I and II programs, with a discussion of the impact of this data on the ability of the Department to achieve program objectives.

(6) A description of the criteria used by the Department to evaluate the success of earned value management in delivering program objectives, with illustrative data and examples covering not less than three years.

(7) Recommendations for improving earned value management and its implementation within the Department, including a discussion of the merits of possible alternatives.

(b) Submission of Report- Not later than 270 days after the date of the enactment of this Act, the Secretary of Defense shall submit the report required by subsection (a) to the Committees on Armed Services of the Senate and of the House of Representatives.

(c) Definition- In this section, the term `earned value management' has the meaning given that term in section 300 of part 7 of Office of Management and Budget Circular A-11 as published in June 2008.

B. Charter

Under Secretary of Defense for Acquisition, Technology and Logistics
Defense Procurement and Acquisition Policy

Earned Value Management Systems Defense Support Team

Terms of Reference

Objective: The Earned Value Management Systems (EVMS) Defense Support Team (DST) will systematically address and provide recommendations to revamp where necessary the earned value management system from requirements through implementation, to include oversight and governance as well as contractual remedies for lack of earned value compliance.

Authority: The EVMS DST is chartered under the authority of USD(AT&L) memo of January 24, 2009, Earned Value Management System Performance, Oversight and Governance.

Scope: Review Department of Defense EVMS policy, guidance, training, and implementation, and the use of EVM data in decision-making, and provide recommendations for improvement.

The DST's initial task will be to contribute to the Secretary of Defense's report on DoD's implementation of earned value management that is required by the Duncan Hunter National Defense Authorization Act (NDAA) for Fiscal Year 2009, Section 887, "Report on the Implementation of Earned Value Management at the Department of Defense." The EVMS DST will address the following:

(1) A discussion of the regulations and guidance of the Department applicable to the use and implementation of earned value management.
(2) A discussion of the relative value of earned value management as a tool for program managers and senior Department officials.
(3) A discussion of specific challenges the Department faces in successfully using earned value management because of the nature of the culture, history, systems, and activities of the Department, particularly with regard to requirements and funding instability.
(4) A discussion of the methodology of the Department for earned value management implementation, including data quality issues, training, and information technology systems used to integrate and transmit earned value management data.
(5) An evaluation of the accuracy of the earned value management data provided by vendors to the Federal Government concerning acquisition categories I and II

programs, with a discussion of the impact of this data on the ability of the Department to achieve program objectives.

(6) A description of the criteria used by the Department to evaluate the success of earned value management in delivering program objectives, with illustrative data and examples covering not less than three years.

(7) Recommendations for improving earned value management and its implementation within the Department, including a discussion of the merits of possible alternatives.

Outcomes: The Department's EVMS policy, guidance, training, implementation, and data should:

- Provide a single management control system
- Improve insight into program performance
- Reduce cycle time to deliver a product
- Promote management by exception
- Foster accountability
- Allow comparative analysis against completed projects
- Provide objective information for managing the program.

The DST will define the criteria to be used to evaluate the success of earned value management in delivering program objectives and then monitor performance against those metrics. The EVM DST will continue to provide recommendations on EVMS policy, guidance, training, and implementation as requested by OUSD (AT&L).

Team Membership: The DST is chaired by the Director, DPAP and comprises senior-level (SES/GOFO) representatives from OUSD(AT&L), DCMA, DAU, the Military Departments, Defense Agencies, and the Office of the Director of National Intelligence. The team comprises an Executive Steering Committee and five subgroups, formed to correspond with the Sec. 887 requirements:

- Subgroup 1, EVM Regulations and Guidance (Lead: DPAP)
- Subgroup 2, Relative Value of EVM for PMs and Senior Officials (Lead: PSA)
- Subgroup 3, EVM Use Challenges and Evaluation Criteria for Success (Lead: DCMA)
- Subgroup 4, Training (Lead: ARA)
- Subgroup 5, EVM Implementation and Accuracy of EVM Data and Impact on Meeting Program Objectives (Lead: ARA)

The DST will also consider any recommendations received from industry for improvement of DoD policy and implementation of EVM.

Schedule and Products: The initial deliverables will include a summary of findings and recommendations to improve DoD's EVMS.

- Establish Team: February 2009
- First DST report to USD(AT&L): 20 February 2009
- Report to Congress, initial draft: 5 June 2009
- Coordination draft: 30 June 2009
- Final report to Congress: 11 July 2009
- Recommendations for action to USD (AT&L): 30 August 2009
- Monitor implementation of recommendations, as directed by USD(AT&L)

The EVM DST will continue to provide reports and recommendations on EVMS policy, guidance, training, and implementation as requested by OUSD (AT&L).

POC: Mr. Michael Pelkey, OUSD(AT&L)DPAP, 703-614-1253, michael.pelkey@osd.mil

Signed by:

Mr. Richard T. Ginman
Deputy Director
Program Acquisition and Contingency Contracting

Appendix C. EVMS Standard (ANSI/EIA-748)

This appendix contains the 32 guiding principles (or guidelines) in ANSI/EIA-748. The standard groups the 32 guidelines into five categories, as shown below:

Organizing

1. Define contract work using work breakdown structure
2. Identify organizational responsibilities to include subs
3. Integrate planning, scheduling, budgeting, work authorization, and cost accumulation
4. Identify overhead control responsibilities
5. Measure performance by work breakdown structure and organizational breakdown

Planning and Budgeting

6. Schedule work showing task interdependencies
7. Identify physical products, milestones, tech performance progress metrics
8. Establish and maintain a performance measurement baseline
9. Establish budgets for authorized work
10. Establish work packages and planning packages
11. Verify work packages plus planning packages equal control account budget
12. Identify and control level of effort work
13. Identify overhead budgets
14. Identify management reserve and undistributed budgets
15. Reconcile project cost goal with internal budgets and management reserve

Accounting Considerations

16. Record direct costs consistent with work budgets
17. Summarize direct costs without allocation to two or more work breakdown structure elements
18. Summarize direct costs without allocation to two or more organization elements
19. Record all indirect costs
20. Identify unit/equivalent unit or lot costs, when appropriate
21. Provide full accountability, performance measurement, and accurate cost accumulation

Analysis and Management Reports

22. At least monthly, provide management with information on planned/accomplished work and costs
23. At least monthly, identify direct cost/schedule variances
24. Identify indirect cost variances as needed
25. Summarize variances by work breakdown structure and/or organizational breakdown
26. Implement/track actions based upon earned value information
27. Develop estimates of costs at completion

Revisions and Data Maintenance

28. Incorporate changes timely
29. Control internal replannings
30. Control retroactive changes
31. Change budget only when authorized
32. Document changes to performance measurement baseline

Appendix D. DoD's EVM Diagnostic Dashboard

DoD is pursuing a number of initiatives, both by itself and with industry, to improve EVM accuracy. This appendix discusses the actions that DoD is taking internally. However, the EVM value chain extends from DoD project offices to contractor management echelons, to the design cubicles and shop floors where value is created. Of course, DoD's EVM auditing and enforcement resources for identifying and rectifying issues in this extensive value chain are limited.

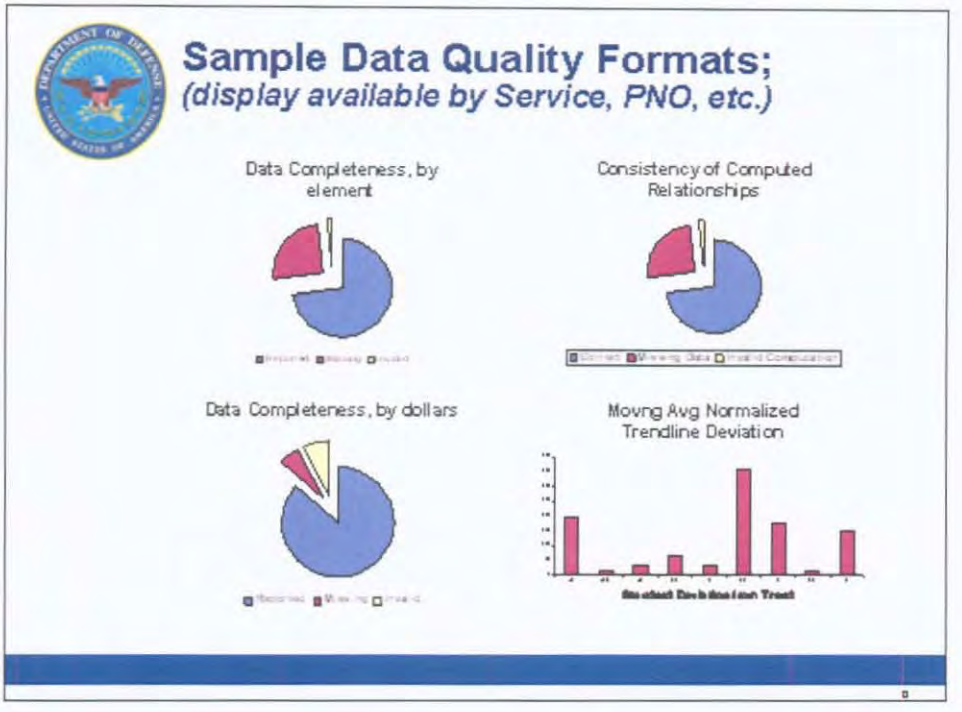
To prioritize the allocation of its EVM enforcement resources, DoD focuses first on EVM improvements in proportionally large or critically important DoD projects. For the balance of projects, DoD uses quantitative diagnostic indicators as a guide in allocating and prioritizing scarce enforcement resources to ensure that the most important, highest-value-added EVM systemic problems are addressed first. Toward that end, DoD has developed an EVM diagnostic dashboard to summarize the completeness, consistency, and coherence of EVM data for a given report, contract, portfolio of contracts in a program, or group of programs (up to, and including, all programs within a Military Department or even DoD as a whole). The dashboard is, thus, a template that serves two related purposes:

- Serve as a scorecard for programs or contractors on, at least, the most basic measures of EVM compliance for which DoD has paid
- Assist with the diagnostic function of identifying particular classes of issues that may exist in specific programs or for specific contractors.

1. Description of the Dashboard

Figure 1 is an example report from DoD's EVM diagnostic dashboard. The left panel addresses data completeness; it shows the fraction of the elements reported in both numerical count and dollar terms. In the example, about 13 percent of data elements are missing, which account for 7 percent of total dollar value of the report. The upper right panel shows the fraction of numerical "cross-footing" relationships (such as "the sum of a certain number of line items must equal the total ascribed to a subsystem") that hold. There may be several reasons for such relationships to *not* hold: one of the subreporting items may be missing or invalid; conversely, some other data may be included and the sum is simply wrong. The display segregates those categories. Finally, the bottom right panel depicts the histogram distribution of the deviation of currently reported figures from a four-period moving average of the elements in the report, measured in standard deviations. There is no "right" or "wrong" entry in this panel (unlike the other panels), because any given data elements may contain "news" in their value. However, reports with a large number of values that behave randomly often are indicative of underlying issues with the accounting and EVM recognition systems. The data are inconsistent across time.

Figure 1. Sample Report from the DoD EVM Diagnostic Dashboard



Taken together, the four panels in Figure 1 represent an EVM diagnostic dashboard that summarizes a first-tier review of a program's compliance with reporting. In practice, we find two things:

- This snapshot is quite helpful in flagging programs with the worst compliance problems. Comparison of these displays across programs helps DoD triage and prioritize the allocation of its scarce EVM enforcement resources in a way that addresses programs with the worst problems.

- The report serves as a scorecard for both government managers and corporate entities about how seriously they take EVM implementation. Simply making these scorecards broadly available creates an incentive to improve performance. Furthermore, we see a distinct and strong (but negative) correlation between compliance, as measured in this display, and program outcomes. It is not hard to see why: poor financial management and discipline are usually indicative of deeper underlying issues within individual programs.

Although the EVM diagnostic dashboard is a helpful tool, it does not represent the end of the line for EVM improvement, but rather the price of admission. A truly useful system that achieves the end cited, situational awareness, requires EVM awareness all the way back to the control account manager on the shop floor who recognizes value.

2. Implementation of the Dashboard

The EVM diagnostic dashboard is being prototyped and implemented in the Office of the USD(AT&L). Because of the nature of the computations (for finding "missing" dollars and

cross-footing computations for data consistency, for example), data structures that accompany the EVM data reports will have to be implemented to enable generation of the dashboard displays. Consequently, implementation will take some time. We currently expect the following schedule:

- Prototype demonstration with live code and several actual EVM data reports: June 15, 2009
- Initial Operational Capability addressing contracts on the top three programs in each Military Department: September 15, 2009
- Full Operational Capability covering the entire MDAP portfolio: June 1, 2010.

In addition, after the MDAP programs have been addressed, other EVM reporting on lower-level programs will be included in the EVMCR database.

Overall, the EVM diagnostic dashboard will represent a major step forward in the visibility and understanding of EVM problems in practice throughout the DoD management chain. As noted, though, in and of itself, the dashboard does not ensure that the data are correct. However, even in terms of accuracy, in practice, enterprises that submit late, inconsistent, or incoherent data are precisely the ones with profound accuracy and recognition problems. Allocating our enforcement resources on this basis is almost certain to go a long way toward resolving and improving the accuracy issues as well.

Appendix E. Successful Corrective Action Plan Leads to EVMS Compliance Improvements

As referenced in Section II.F.2.b.iii, Bell Helicopter's successful Corrective Action Plan (CAP) yielded positive results. DCMA began to scrutinize Bell's EVMS as early as 2000, with several compliance and other reviews occurring over the subsequent periods. In March 2006, despite Bell's efforts to improve, DCMA formally disapproved Bell's EVMS and found it to be noncompliant with the ANSI/EIA-748 guidelines. Following this review, Bell developed a comprehensive and integrated CAP that drove significant EVMS improvements. DCMA conducted a follow-on validation review in August 2008 and noted significant improvement. Although three of thirty-two guidelines were still noncompliant, the results were dramatically better than those of the March 2006 review, in which 14 guidelines were considered noncompliant. In April 2009, DCMA conducted a final validation review and found Bell to be fully compliant on all 32 guidelines. A new Advanced Agreement was executed in May 2009, formally approving Bell's EVMS.

The 2006 CAP helped drive the improvements that resulted in achieving EVMS approval. The plan focused on the three critical components of a functioning EVMS: people, processes, and tools. All three areas required—and drove—significant improvement by Bell. Some of the major changes that took place are highlighted below.

- People improvements: Revamped organization structures in the EVM core and deployed program personnel; improved and expanded role-based training curriculum; consistent meeting tempo providing for greater coordination, issue resolution and lessons learned; and concentrated efforts to improve Control Account Managers' (CAMs) knowledge through training and mentoring sessions.

- Process improvements: Introduction of lower-level manufacturing and material dollar detail allowing for better data visibility, monthly program EVM reviews with Bell executives, completion of detailed process mapping and control points to improve and ensure processes function as intended, and process changes to coincide with the Baseline Authorization and Control Application (BACA), Bell's tool for managing work authorization and changes.

- Tool improvements: Introduction of Premier (Bell's one-stop-shop for EVM data), EZ-EV (an online library containing all of Bell's process documentation, including hundreds of detailed work instructions and work aids), BACA, and an upgraded version of PPM (Bell's scheduling tool) that allows for improved critical path analysis.

The integration of these efforts was critical to Bell's EVMS improvement. First, the introduction of executive reviews (which have now gone on monthly for over three years) helped drive an operating rhythm that was supported by the new tools and process changes. Management's attention drove adherence to Bell's processes and emphasized the criticality of "management use" of the EVM information. With senior leadership active and interested, a ripple effect through the programs occurred from PMs through to the CAMs, with the end result being a change in culture where EVM information is now relied upon, utilized, and desired.

As more and more people used EVMS data and wanted more detail to make decisions quicker, it became imperative that tool improvements must be made to allow the CAMs to get the information they need easier and quicker. Armed with accurate and timely information they can utilize the data to make informed decisions in managing their effort. The improved processes helped streamline the effort necessary to maintain the system. The introduction of the EZ-EV and Premier tools made it significantly easier to understand processes and receive information. As less time was spent understanding and getting data, more time has been devoted to taking action on the information, as Figure 1 depicts.

Figure 1. Bell Helicopter EVMS Dashboard

The end result is that today, Bell believes its EVMS is now a company strength, where before it was a weakness. The Premier tool was recognized by Textron, Bell's parent company, as the winner of its 2007 Finance Best Practice award, and DCMA has noted that it is a leading industry tool. Bell believes it is at the forefront in integrating EVMS and risk management data, providing program personnel even better capability to manage and mitigate program risks.

These EVMS improvements, combined with other company initiatives such as increased capital spending, implementation of lean practices, increased focus on rigorous process control (Sarbanes-Oxley approach to process control), and an environment embracing continuous improvement, have resulted in significantly improved program management and execution. Evidence can be seen in on-time delivery metrics and improved cost performance. For example, V-22 deliveries have been on time or early to contract for approximately two years, and Bell's cost performance (estimates at completion) have stabilized and improved.

While Bell has made significant improvement, it recognizes the need to continually improve and move well beyond compliance to industry leading in all aspects of EVMS and program management.

1. Continuous Improvement

Bell firmly believes in, and is committed to, continuously improving its EVMS. Immediately after the successful April 2009 review, Bell began a comprehensive improvement project. This effort, expected to last about a year, includes the following components:

- Additional training courses, including advanced classes on data analysis.
- Streamlining of processes to reduce the time it takes to process data and allow more time for analysis and action. Examples include an improved schedule status tool, a new actuals interface, and an upgrade to Premier version 2.0.
- Further enhancements to existing Premier tools, such as the automated Variance Analysis Report tool and Risk, Issue and Opportunity management reports; as well as new functionality, such as an Independent Estimated Completion Date calculator, system-level metrics, and additional schedule metrics.

Combined with this improvement project, senior management continues to push for improvement within the program management ranks, and Bell is extending its EVMS to commercial efforts (it already utilizes EVMS on numerous military contracts that do not require EVMS, as the company firmly believes EVMS is a best practice that should be utilized to manage important projects and programs).

2. Summary

Bell Helicopter had to overcome many years of inattention to sound EVMS practice and change its view of EVMS as a government report versus a set of integrated processes and tools to effectively manage programs/projects. Because Bell's programs are critical to customer success (whether military or commercial), it is serious about the need to execute to schedule, cost, and technical requirements. A strong EVMS is a critical component.

While the path through government EVMS reviews, disapproval, and finally re-approval was not easy, the end result was important change and a renewed focus. By partnering with DCMA and government customers, Bell was able to address its shortcomings and turn them into strengths. The effort to effectively develop, demonstrate, and maintain a compliant system should not be understated; but the results are necessary to manage the very complex products and programs for which Bell is responsible.

Individual company processes and needs vary, but Bell believes that an integrated approach to developing, implementing and maintaining an EVMS is critical. The key elements of people, processes, and tools must be carefully considered and executed in a coordinated manner. Strong leadership from senior management is critical, as is a consistent company tempo or operating rhythm (e.g., timelines for executing processes as well as consistent reviews). Doing this right takes time, but it is more important to set in place the critical elements than to quickly apply a bandage to broken processes or ineffective tools.

Appendix F. Abbreviations

ACAT	Acquisition Category
AF	Air Force
ANSI	American National Standards Institute
CEVM	Center for Earned Value Management (Navy)
CFR	Code of Federal Regulations
COE	Center of Excellence (Army and NGA)
CPARS	Contractor Performance Assessment Rating System
DAES	Defense Acquisition Executive Summary
DAMIR	Defense Acquisition Management Information Retrieval
DAU	Defense Acquisition University
DCMA	Defense Contract Management Agency
DFARS	Defense Federal Acquisition Regulation Supplement
DoDI	DoD Instruction
DPAP	Defense Procurement and Acquisition Policy
DST	Defense Support Team
DUSD(A&T)	Deputy Under Secretary of Defense for Acquisition and Technology
EIA	Electronic Industries Alliance
EVM	Earned Value Management
EVMCR	EVM Central Repository
EVMS	Earned Value Management System
IBR	Integrated Baseline Review
IC	Intelligence Community
IMS	Integrated Master Schedule
IPT	Integrated Product Team
LOE	Level of Effort
MAIS	Major Automated Information System
MDA	Missile Defense Agency
MDAP	Major Defense Acquisition Program
NAVSEA	Naval Sea Systems Command
NDAA	National Defense Authorization Act

NDIA	National Defense Industrial Association
NGA	National Geospatial-Intelligence Agency
OSD	Office of the Secretary of Defense
PEO	Program Executive Officer
PM	Program Manager
PMB	Performance Measurement Baseline
PMO	Program Management Office
PMSC	Program Management Systems Committee
SAE	Service Acquisition Executive
SAF(AQX)	Deputy Assistant Secretary of the Air Force for Acquisition Integration
SAF(AQXR)	Deputy Assistant Secretary of the Air Force for Acquisition Integration, Program Integration Division
SAF(FMC)	Deputy Assistant Secretary of the Air Force for Cost and Economics
SOA	Service Oriented Architecture
SSOM	Standard Surveillance Operating Manual
SUPSHIP	Navy Supervisor of Shipbuilding
USD(AT&L)	Under Secretary of Defense for Acquisition, Technology and Logistics
WBS	Work Breakdown Structure