Report to Congress on Performance Assessments and Root Cause Analyses

Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics

March 2014

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The estimated cost of report or study for the Department of Defense is approximately $17,000 in Fiscal Years 2013 - 2014.
This includes $0 in expenses and $17,000 in DoD labor.
Cost estimate generated on February 21, 2014 RefID: 4-0B4FA11

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Purpose and Background

This report is in response to the legislative reporting requirement levied by section 103 of Public Law 111-23, the Weapon Systems Acquisition Reform Act (WSARA) of 2009, which directed the establishment of the Office of Performance Assessments and Root Cause Analyses (PARCA).[1] This report addresses major organizational goals and responsibilities, key findings, and process improvements related to the acquisition of major defense acquisition programs (MDAPs).

Within the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)), PARCA is directed by Mr. Gary Bliss, who reports through the Assistant Secretary of Defense for Acquisition (ASD(A)) to USD(AT&L) in fulfilling PARCA statutory and non-statutory responsibilities. Statutory responsibilities include conducting and advising on performance assessments, performing root causes analyses, and issuing policies and guidance on their development. Non-statutory responsibilities include Earned Value Management (EVM) activities that evaluate cost, schedule, and performance metrics and independent, rapid-response analyses directed by USD(AT&L) to inform improvements in acquisition investments and strategies. PARCA is fully instantiated into AT&L business processes and institutions and is well positioned to impart constructive, independent guidance and direction on program development and acquisition. PARCA applies intellectual rigor in the critical analyses and assessments it develops and maintains a solid reputation across the Department of Defense (DoD) as an independent, unbiased, and honest broker that recommends positive institutional changes and reform.

A full description of the PARCA organization and its staff is included at Attachment A. PARCA operational effectiveness over the past year was temporarily improved by the hiring in May of a temporary executive as the Root Cause Division Deputy. The positive impact of filling this executive position to execute statutory responsibilities was lessened, however, when the Deputy for Performance Assessments departed 5 months later in October 2013. This Deputy position had been occupied by an Intergovernmental Personnel Agreement (IPA) officer, but the regulatory time limitation of that agreement expired, and PARCA was unable to secure a replacement executive position. Accordingly, a personnel shortfall remains because the directorship of one of two statutory functions is unoccupied: last year, the Root Cause Analysis deputy was vacant, and this year the Performance Assessments deputy is vacant. Pending a permanent replacement, it is being filled by a GS-15-equivalent acting deputy.

2013 PARCA Activities

Performance Assessments Division

Statutory and Related Functions. Within the acquisition management framework, PARCA leverages Defense Acquisition Executive Summary (DAES) meetings to ensure all MDAPs are assessed periodically and to determine execution issues in the MDAP portfolio that

[1] Section 103 of WSARA has been codified in title 10, U.S.C., section 2438.

require the Under Secretary's attention. Typically chaired by the USD(AT&L), these monthly meetings and associated processes represent the major means by which PARCA reports on its performance assessments. Specifically, DAES meetings determine which programs warrant the attention of the Under Secretary and provide comprehensive insight and recommendations from Department-wide sources to ensure a thorough vetting of each critical issue within the DAES environment. PARCA is an active participant in all parts of the DAES process, from nominating programs for the DAES meeting to contributing to the assessments of programs to actively participating in the meetings themselves.

During 2013, PARCA completed seven Performance Assessment Memoranda for programs that experienced earlier critical Nunn-McCurdy breaches under section 2433a of title 10, U.S.C.. An example of the positive impact these memoranda engender is that the Joint Strike Fighter (JSF) Memorandum resulted in a meeting between the JSF Program Manager (PM), PARCA, and the USD(AT&L), which renewed focus on an issue of critical importance to the JSF program. PARCA further developed metrics for measuring progress against long-term procurement costs goals using data from early production lots. The JSF PM has adopted these metrics as an assessment tool for tracking and briefing program costs. Additionally, PARCA generated Evolved Expendable Launch Vehicle memoranda that track the pool of competitive launches and enterprise progress towards addressing fixed costs. These are two important factors in assessing a key root cause of past cost growth. The acquiring Service is now focusing on fixed cost reduction and introducing competition, and progress will be monitored.

In addition to the aforementioned Nunn-McCurdy Memoranda, four Performance Assessment Memoranda were written in support of Full Rate Production authorization decisions. In particular, the Standard Missile Six assessment changed the way in which reliability, as demonstrated in testing, was described and used to evaluate performance against requirements. PARCA's methods are now the standard for this program. In another memorandum, PARCA developed a detailed model for system reliability so that decision-makers could reconcile seemingly different results from deployed operations and developmental test. The model results were an important part of the decision to modify the requirements, and they have been used to evaluate the Service's own model.

PARCA likewise continued to perform the statutorily-required assessments of programs that have been certified following a breach of Nunn-McCurdy thresholds or of programs approaching full rate production or multiyear procurement decisions.

Non-Statutory Functions. PARCA is an active participant in the Overarching Integrated Product Team (OIPT) and Defense Acquisition Board (DAB) processes to which it regularly contributes independent insights, and as-warranted, detailed analyses of critical issues. In the past year, these analyses included detailed reliability assessments, comparisons of cost performance to funding levels, rigorous schedules performance assessments, analyses of the cost structure of a supplier and interactions between related programs. These analyses were included in OIPT and DAB discussions and in the Deputy Secretary's Defense Management Advisory Group as part of the Department's budget review.

Also, during the course of its statutory work, PARCA periodically discovers issues that

warrant further analysis and on some occasions warrant a memo to the USD(AT&L). In one such case this year, PARCA performed an analysis of the Global Positioning System Constellation, a significant, complex and aging system. PARCA's analysis distilled the complex interactions involved and created a means for more constructive discussion. It informed USD(AT&L) of critical aspects related to GPS long-term viability.

Root Cause Analyses Division

As noted in the introduction, PARCA's new Deputy Director for Root Cause Analyses joined PARCA in May 2013, following 14 months during which the position was vacant. Fortunately, for the first time since 2000, DoD had no programs that breached critical Nunn-McCurdy thresholds, and thus no statutory root cause analyses were required. In 2013, the Root Cause division did conduct one discretionary root cause analysis directed by USD(AT&L) as described below.

Root Cause Analysis Performed. In December 2012, the USD(AT&L) approved the U.S. Air Force's recommendation to terminate the Expeditionary Combat Support System (ECSS) program, an Acquisition Category (ACAT) 1AM Major Automated Information System (MAIS). ECSS was an Enterprise Resource Planning System intended to replace hundreds of legacy logistics software applications but was canceled after 7 years of effort and over $1 billion expended. On December 5, 2012, the Chairman and Ranking Members of the Senate Armed Services Committee (Senators Levin and McCain, respectively) sent a letter to former Secretary of Defense Leon Panetta, which, among other things, requested a root cause analysis to determine reasons for the program's failure. From May – August 2013, PARCA conducted a root cause analysis of the ECSS program and provided its findings to the USD(AT&L) in the report at Appendix 3. On September 10, 2013, this report was transmitted in its entirety by the USD(AT&L) to Senators Levin and McCain as a partial answer to their December 5, 2012, letter.

Updated Root Cause Findings. Table 1 provides a summary of findings from the complete set of 18 root cause analyses conducted by PARCA from stand-up of the organization in 2010 through CY 2013. In previous PARCA Annual Reports, such summaries did not include program names. This was due to the fact that over half of PARCA's Root Cause Analysis Memoranda had been designated For Official Use Only (FOUO), primarily because they were included in an FOUO Nunn-McCurdy package submitted annually to Congress. In November 2013, ASD(A) approved redesignation of all PARCA Root Cause Analyses Memoranda from FOUO to publically releasable. These memoranda and their supporting technical reports prepared by RAND and IDA are now available at the following website: http://www.acq.osd.mil/parca/references.shtml.

This release approval will improve PARCA's ability to disseminate lessons learned among the broad acquisition community, including DoD's industrial performers. As reported in detail in PARCA's 2012 report, the findings indicate that the most common root cause during inception was unrealistic baseline cost or schedule estimates, while the most common root cause during execution was poor performance by the Government or contractor personnel responsible for program management. It is also noteworthy that two issues that are frequently cited as causes

of poor program performance, technology immaturity and funding instability, were relatively infrequently identified as root causes of cost growth for the programs examined by PARCA from 2010-2013.

Congressionally Requested Assessment of the Distributed Common Ground System – Army (DCGS-A) Program. The House Armed Services Committee (HASC) Report 113-102, which accompanied the National Defense Authorization Act for Fiscal Year 2014, requested that PARCA participate in an assessment of the DCGS-A program. Specifically, the report requested the "Director, Operational Test and Evaluation (DOT&E) to review the DCGS-A program and submit a report to the congressional defense committees..." and further stated:

> *...the committee directs the Under Secretary of Defense for Intelligence, in coordination with Performance Assessment and Root Cause Analysis office, to provide a briefing by October 18, 2013 providing an additional assessment of the DOT&E report.*

Because PARCA has limited expertise analyzing operational effectiveness of systems, PARCA's Director met with HASC staff to ascertain congressional intent. He was advised that Congress intended PARCA to provide a performance assessment of DCGS-A, analogous to its statutory duties. PARCA's assessment thus focused on cost, schedule, and performance metrics and program management effectiveness.

Although program performance assessments are typically conducted by the PARCA PA Division, because DCGS-A is a MAIS program, the Deputy Director for Root Cause Analyses led the assessment based on the recent experience conducting a root cause analysis of the ECSS MAIS program described above. He interviewed subject matter experts in multiple DoD organizations, including staff specialists in DOT&E, Under Secretary for Defense for Intelligence (USD(I)), ASD(A) Command, Control, Communications and Cyber (C3&Cyber), and program management officials. PARCA's report, provided as Appendix 3, concluded that "DCGS-A Inc 1 is executing in accordance with its baseline cost and schedule estimates and the management team has been effective" and "the DOT&E report adequately addresses the operational performance areas stipulated in HASC Report 113-102." On November 27, 2013, PARCA's report and the USD(I) briefing assessing DOT&E's report on DCGS-A were transmitted by the USD(AT&L) and USD(I) to the Chairman and Ranking Members of the HASC (Representatives McKeon and Smith, respectively).

Non-Statutory Activities Performed by the Root Cause Analysis Division

Framing Assumptions Implementation. PARCA has continued to develop the Framing Assumptions concept as a means to inform acquisition leaders about key program assumptions, stimulate discussion of their validity, and establish a context for program assessments. An Information Paper on Framing Assumptions was developed (Appendix 3) and a template was approved by ASD(A) for briefing Framing Assumptions at Milestone A and B reviews. In 2013, PARCA worked with several program management offices to develop and/or refine their programs' Framing Assumptions as they prepared for a Milestone review.

Analysis of the Acquisition Workforce. PARCA was tasked by ASD(A) to conduct a study to ascertain relationships between the characteristics and qualifications of the acquisition workforce and workforce productivity. Supported by a federally funded research and development center (FFRDC), PARCA examined acquisition workforce characteristics using five major OSD workforce databases and examined workforce productivity in various ways, ranging from MDAP performance outcomes obtained from the Defense Acquisition Management Information Retrieval System (DAMIR) and Selected Acquisition Reports to contracting transactional data obtained from the Federal Procurement Data System-Next Generation. The findings thus far from the research have not been promising. Inadequate fidelity and reliability of data within the databases examined has made it impossible to even test the hypothesis whether a correlation exists between acquisition workforce characteristics and productivity. Specifically, for multiple reasons, it has not been possible to place specific personnel in specific acquisition organizations conducting specific acquisition functions. The research is continuing with a test case of a single Systems Command for which the data is being manually verified and validated in partnership with the System Command's HR community.

Better Buying Power 2.0 Initiative — "Eliminating Requirements Imposed on Industry for which Costs Outweigh Benefits." PARCA was assigned by ASD(A) to lead an OUSD(AT&L) study examining six DoD-related regulations or statutes that were identified by industry as having little or no value. Twelve DoD contractors have been invited to submit data in support of the study, and in December 2013, representatives from all 12 companies participated in individual kick-off meetings with ASD(A) and other Government study team members including the Defense Contract Management Agency (DCMA), the Defense Contract Auditing Agency, AT&L/Manufacturing and Industrial Base Policy, AT&L/Defense Procurement and Policy, and the Institute for Defense Analysis. The goal of the study is to provide compelling evidence based on quantitative data that will lead to modification or rescission of non- or low-value added regulations or statutes and/or improve DoD's implementation of such, to improve efficiency and lower cost of DoD operations and those of its industrial partners. Results from this study are projected to be reported in Fall 2014 and will be reported in detail in PARCA's 2015 Annual Report.

Analysis of Schedule-driven Programs. During a Defense Acquisition Executive Review, USD(AT&L) tasked PARCA to examine instances in which programs attempt to compress their planned schedule to make up for schedule slips. The Deputy Director for Root Cause Analyses interviewed numerous subject matter experts from AT&L, the Deputy Chief Management Office, Defense Acquisition University (DAU), and the Services to gather information on schedule-driven behavior exhibited by DoD acquisition programs. Results were documented and provided to USD(AT&L) in a paper entitled "Schedule or Event Driven: How Do I Know?" This paper which is included in Appendix 3 will appear in a 2014 issue of *Defense AT&L Magazine* and is another example of how PARCA disseminates its lessons to the acquisition community.

Table 1: PARCA Root Cause Analysis Findings, 2010-2013

	Root Cause Analysis Table	WGS	ATIRCM	CMWS	RMS	AB3	DDG-1000	JSF	Excalibur	ACWA	RQ-4A/B GH	Navy ERP*	GCSS-MC *	JTRS GMR	FAB-T*	JLENS	P-8A *	EELV	ECSS *	Totals
Inception	Unrealistic performance expectations			X															X	2
	Unrealistic baseline estimates for cost or schedule							X		X	X	X	X							6
	Immature technologies or excessive manufacturing or integration risk			X									X							2
	Other											X								2
Execution	Unanticipated design, engineering, manufacturing or technology integration issues arising during program performance	X		X																2
	Changes in procurement quantity					X	X		X							X				4
	Inadequate program funding or funding instability																			0
	Poor performance by government or contractor personnel responsible for program management				X			X			X	X	X	X	X			X	X	10
	Other	X																X		2

NOTES

* Indicates a discretionary root cause analysis

Earned Value Management Division

As the office responsible for EVM performance, oversight, and governance across the Department, PARCA continues to challenge the earned value community to implement earned value in a way that is self-evidently beneficial and cost effective. In 2013 – its second full year

of execution – the PARCA EVM Division demonstrated it was fully assimilated into the OSD and AT&L enterprise and oversight processes.

PARCA has worked closely with DCMA and the Services EVM experts to evaluate EVM inefficiencies and initiate efforts to reduce the burden of EVM implementation. In its role as the EVM Functional Lead, PARCA is fully operational and supporting the Better Buying Power 2.0 AT&L improvement of the workforce initiatives such as the Acquisition Qualification Workforce Initiative and the development a review board process to evaluate and select individuals to fill Key Leadership Positions (KLP) to manage programs. Finally, the EVM Division has established the EVM-CR as the authoritative source for Earned Value data by providing real-time access to EVM program data and EVM data quality to the AT&L enterprise. The first user is the DAMIR system.

PARCA EVM Division has addressed all six initiatives the Department recommended in a September 1, 2009, Report to Congress that responded to the section 887 of the National Defense Authorization Act for Fiscal Year 2009, as amended by section 302 of the 2009 WSARA.

Acquisition Policy Analysis Center

Statutory and Related Functions. The Acquisition Policy Analysis Center (APAC) monitors the Department's compliance with the Improve Acquisition Act of 2010 (Title VIII, Subtitle F, Public Law 111-383, section 861 codified in title 10, U.S.C., section 2548) on institutional performance assessments of the defense acquisition system.

The Department continues to execute independent performance reviews, as well as measure and report institutional performance against quantitative performance measures in the annual President's budget submission. As noted in the 2011 PARCA report, USD(AT&L) requested that PARCA lead efforts to establish a more responsive, useful, and transparent institutional performance measurement system. This initiative is now part of the USD(AT&L) Better Buying Power 2.0 strategic effort and was a focus for PARCA in 2013. A major output of this effort was a new annual report of analytic results measuring the institutional performance of the defense acquisition system. This report was released to the public on July 8, 2013. While similarly motivated, APAC efforts go beyond the specifics of this act to seek additional insights for improving the performance of the defense acquisition system.

Non-Statutory PARCA Functions. The APAC Division also leads a number of other strategic initiatives for the USD(AT&L) and provides confidential, independent, rapid-response analyses to improve acquisition investments, strategies, and policies. For example, APAC continues to provide leadership and concept development for two other Better Buying Power 2.0 initiatives: 1) achieve affordable programs by establishing affordability analysis policy and enforcing affordability constraints; and 2) reduce cycle time while ensuring sound investment decisions.

Outreach

PARCA plays a key role in informing the Defense acquisition community of analyses, assessments, recommended best practices, and available analytic support tools to enable critical process improvements throughout the acquisition enterprise. Accordingly, outreach activities are essential to PARCA mission accomplishment, and they represent an ever-increasing PARCA function to improve the usefulness of analyses and tools. The Performance Assessments and Earned Value Management directorates are particularly tied to external organizations to gather assessment information from myriad organizations in the case of the former and to coordinate and structure data collection processes and policies in the case of the latter.

Before his departure, the Deputy Director, Performance Assessments (PA) spoke at the DAU AT&L Staff Specialist Acquisition Course. He detailed how the PA Division uses data to perform is statutory function of providing performance assessments. This presentation was rated very highly by the DAU Acquisition Community. Additionally, PA presented at the National Defense Industrial Association (NDIA) Program Management Systems Committee Conference, describing how EVM data are used by the PA division and why those data are of such high value to the Under Secretary.

The EVM Division works to improve the ability of acquisition professionals to use EVM across the acquisition chain, increase the quality and utility of EVM data, and reduce contractor administrative burden of inefficient EVM use. In 2012, PARCA completed a detailed DAU EVM course content review and published a baseline competency model. PARCA established a new security policy and designed a specific process for contractor access to the EVM central repository, and it established quarterly meetings to ensure industry and Government EVM interaction. PARCA also maintains an EVM website to publicize the latest in policy and guidance, and it established an issue resolution process for the adjudication of EVM policy interpretation. In these ways it enables constructive communication among industry and Government officials within the acquisition community.

Root Cause analyses increase in value when their lessons are more widely disseminated and can be used to improve future acquisition outcomes. As described above, PARCA's Root Cause Analyses findings are now available in their entirety on an OUSD(AT&L) website available to the general public. The site also hosts supporting analyses from the Institute for Defense Analyses and RAND. PARCA also briefs its Root Cause analysis results to:

- Current and future program managers at DAU's Executive Program Management Course and at the AT&L Staff Specialist Course.
- Current program managers and program executive officers at conferences such as the 2013 Senior Leaders Acquisition Training Conference.

The APAC Division provided formal and informal guidance on performance assessment and the new affordability policy through an update of the Defense Acquisition Guidebook, Chapter 3.2, along with publications, talks and meetings on affordability and performance assessment.

PARCA's participation in conferences was curtailed in 2013 due to budgetary constraints and restrictions on conference participation.

2013 PARCA Products and Accomplishments

Performance Assessments

The DAES forum remains the primary mechanism for executing periodic performance assessments. It relies on expertise from throughout the acquisition enterprise to evaluate program progress in 11 different categories. PARCA surveyed several hundred assessments performed by OSD staff to evaluate their consistency with the assessment guidance published by PARCA last year. The results were encouraging in that greater than 90% were largely consistent with the guidance and more than two-thirds were of adequate rigor.

PARCA produced performance assessments on eleven programs following Nunn-McCurdy certification or prior to Multiyear and Full Rate Production decisions as required by the 2009 WSARA legislation. Summaries of these assessments are included in Appendix 2.

PARCA also provided changes to the new Defense Acquisition Guidebook reflecting the new DAES guidance and associated process changes. As part of the revamped DAES process initiated by PARCA's Assessment Guidance document, PARCA has begun performing formal written assessments of contract performance for all active on contracts on all MDAPs. This assessment category emphasizes earned value management and integrated master schedule analyses – two areas in which PARCA has developed distinctive competence within OSD. The results of these assessments are included in the DAMIR database. PARCA performs this analysis for approximately thirty programs each month.

Root Cause Analyses

As described above, PARCA completed a discretionary Root Cause analysis in 2013 on the Air Force's ECSS program and an assessment of the cost, schedule, performance ,and management effectiveness of the DCGS-A program. Each of these analyses resulted in a memorandum to the USD(AT&L) (Appendix 3) and, in the case of ECSS, an expanded technical report and briefing fully documenting the work.

In addition, the PARCA director, or one of his Deputy Directors, briefed PARCA's findings on root causes, framing assumptions, and Better Buying Power initiatives to over 30 audiences in 2013. These included Government-only forums, such as DAU courses, as well as mixed industry-Government groups, such as the NDIA and the Council of Defense and Space Industry Association. In addition to briefing PARCA's root cause findings on the ECSS program at DAU's Executive Program Managers' Course, the Deputy Director for Root Cause Analyses conducted a three-hour DAU-sponsored Mission Assistance workshop with the program manager and other key leaders of the U.S. Air Force Integrated Personnel and Pay System program, which is a MAIS program with similar objectives to those of ECSS.

Earned Value Management

The EVM Division continues to influence the implementation of earned value management in the field. Several examples follow:

PARCA concentrated its effort in 2013 in clarifying the role between PARCA and DCMA with respect to the policy for and implementation of EVMS compliance reviews across the Department. PARCA is the policy owner for DoD, and consistent with DFARS Subpart 242.302(71), DCMA is the Agency responsible for conducting compliance reviews for the Department. Jointly, PARCA and DCMA have developed an approach to streamline the compliance process through an update policy and automation of the compliance reviews done by DCMA. This approach will ensure consistent application of the compliance review process and will reduce the burden on the contractor to support compliance reviews.

As the EVM Functional lead for the Department, PARCA established a process for surveying the acquisition workforce to determine the numbers of earned value practitioners and their level of expertise in earned value. The survey will target two groups across the entire 4th Estate and the Services. The first group includes Earned Value specialists who support program offices. Data from this survey will help to determine how many there are, to what career fields do they belong, whether they are co-located with the program office or part of functional staff that support a number of programs, and how many are support contractors. The second group includes people who use earned value to help with their core mission, such as program managers, system engineers, and business and financial people. The surveys will be periodic and will start in early 2014.

PARCA officially established the EVM Central Repository as the single authoritative source for MDAPs' earned value data and has provided access to these data to AT&L and the Services. AT&L pulls data directly from the EVM-CR, which contains the earned value data from the contractor and combines this information with the Program Manager and Service assessments of the program as part of the DAMIR system. This will allow all hierarchies of the acquisition oversight process to review and assess programs based on the same information.

Acquisition Policy Analysis Center

The APAC Division developed new approaches for improving the Department's ability to measure institutional performance. It developed a conceptual framework to differentiate data and metrics based on the acquisition system stage (input, process, and output/outcome) and type of acquired item (weapon system or logistical goods, knowledge-based or labor-based services). While it continues to focus on using existing data to minimize the reporting burden on the Military Departments, it is using this conceptual framework to identify high-value data gaps to fill for future analyses. Additionally, APAC developed a number of new measurement approaches, including new ways to measure program-level and contract-level cost and schedule growths that improve insight and transparency. For example, a new way to measure recurring production cost growth that controls for quantity changes will measure if, when, and how much

quantity adjustments affect cost. Also, analyses of contract cost growth provide lower-level and advanced indicators of program cost problems.

The results of APAC analysis and methodology development to date were published in the 2013 AT&L report on the Performance of the Defense Acquisition System for which we were lead authors.[2]

APAC also expanded the theoretical underpinnings and approaches for determining program affordability and drafted new policy and guidance that closes conceptual gaps in prior concepts. APAC was the lead author of Enclosure 8 on Affordability Analysis and Investment Constraints in the new Interim DoD Instruction 5000.02.[3] APAC socialized these approaches across the Department's acquisition community to identify and resolve practical issues and facilitate implementation. APAC also published an article countering misconceptions of the Department's new affordability policy, and APAC authored a major revision of the Defense Acquisition Guidebook guidance on affordability.[4,5]

2014 PARCA Goals and Institutional Evolution

A major 2014 PARCA goal is to improve agility in the acquisition, intelligence, and requirements institutions in order to better serve the needs of the Warfighter and the expectation of the American taxpayer. Value is created in a warfighting context when uniformed personnel utilize systems in an integrated way against a particular threat or target while overcoming all the actions and means of the target to avoid successful pursuit of its mission. The acquisition, intelligence, and requirements systems or processes form the basis of a three-legged stool which supports the Warfighter, but they are inherently slow and not integrated to a level that sustains core force capabilities. PARCA leadership is working over the long term within the Department and the Intelligence Community to move from this status quo to a fully agile enterprise. Its goal is to instantiate persistent, duplex communications to make these processes more valuable, timely, and less costly. This will require migrating from fixed document interchanges to more transaction-oriented processes that promote mutual real time situational awareness and cooperation. By establishing such transparent institutional interfaces, it is expected that each system will be more responsive to the rapidly evolving threat and more efficient in its service to the Warfighter.

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[2]See *Performance of the Defense Acquisition System, 2013 Annual Report*. Washington, DC: Office of the Under Secretary of Defense, Acquisition, Technology and Logistics, 2013. As of January 16, 2013: http://www.acq.osd.mil/docs/Performance%20of%20the%20Def%20Acq%20System%202013%20-%20FINAL%2028June2013.pdf

[3]See: Interim DoD Instruction 5000.02, "Operation of the Defense Acquisition System," November 25, 2013, pp. 117–121. As of January 16, 2014: http://www.acq.osd.mil/docs/DSD%205000.02_Memo+Doc.pdf

[4]See: Ohlandt, Chad J.R, "Dispelling the Myths of DoD's Affordability Policy," *Defense AT&L*, Sept-Oct 2013, pp. 4–8. As of January 16, 2013: http://www.dau.mil/publications/DefenseATL/DATLFiles/Sep-Oct2013/Ohlandt.pdf

[5] See: *Defense Acquisition Guidebook*, Chapter 3.2, June 2013. As of January 16, 2014: https://acc.dau.mil/CommunityBrowser.aspx?id=488334

Performance Assessment Division

In addition to actively participating in the DAES process, performing contract performance assessments, and developing its overall statutorily required assessments, the Performance Assessment Division's primary goal for 2014 will be to build on last year's implementation of the DAES Assessment Guidance. It is PA's goal to continue the improvement of all categories of performance assessment across the enterprise and to implement and track affordability analysis and constraints. It will actively seek observations, input, and best practices from other organizations and will continue to create and share tools applicable to performance assessments.

Root Cause Division

The Root Cause Analyses Division's primary goal is to conduct root cause analyses of MDAPs that declare a Nunn-McCurdy breach and other analyses as assigned by USD(AT&L) and ASD(A). There are indications that at least one and possibly two MDAPs will declare critical Nunn-McCurdy breaches during the first quarter of 2014. A continuing goal is to disseminate useful findings on programs and systemic issues to the acquisition community. Specific objectives within this goal are to demonstrate the efficacy of framing assumptions for improving cost estimates and decision making and to improve communication of our results via the Web, conferences, and education. Another major objective is to complete the on-going study examining the relationship between characteristics of the acquisition workforce and acquisition outcomes and to provide initial results for the recently commenced study on "Eliminating Requirements Imposed on Industry For Which Costs Outweigh Benefits."

Earned Value Management Division

The Earned Value Management Division plans to pursue four key initiatives for 2014. First, it will update the Defense Federal Acquisition Regulation Supplement (DFARS) to clarify the criteria for the application of earned value to a particular contract. The current DFARS uses only contract type and contract value as criteria. The updated DFARS, however, will address the type of work, contract type, and contract value. Additionally, it will address the need to manage all Government programs regardless of whether earned value applies or not. Second, PARCA plans on creating an Earned Value Management System Requirements Instruction to document the DoD interpretation of the ANSI-STD 748C. This policy will clarify the use of earned value management within the Department and will provide a basis from which DCMA will execute compliance reviews. Third, PARCA will gather and analyze the workforce survey data to determine how the earned value skill set can be improved across the enterprise. It will use DAU course reviews and its participation in AT&L workforce improvement initiatives such as the AWQI and the KLP initiative to support this initiative. Finally, the PARCA EVM Division will identify, document, and publish specific methods for relating technical performance to earned value performance. The goal is to provide more accurate joint, program office, and contractor situational awareness of the program execution. PARCA believes that earned value metrics and technical metrics such as Technical Performance Metrics should be consistent with program progress. Earned Value focuses on the completion of a set of tasks to mature the design. It

should be consistent with the set of metrics that indicate the actual design maturity.

Acquisition Policy Analysis Center

The APAC Division's overarching goals are to provide analytically sound insights to AT&L leadership on key policy issues while improving AT&L's ability to assess policy and institutional performance to provide transparency and inform sustainable improvements. One major thrust is to continue improving knowledge of and access to data for analytic purposes, leveraging existing databases and sources. Another thrust is to continue contributing to the rigor of analytic concepts and approaches within AT&L. Besides the continued leadership of the strategic initiatives identified above, a major product will be the publication in 2014 of the second annual *Report on the Performance of the Defense Acquisition System*.

Summary

PARCA has established itself as a leader in tendering comprehensive, unbiased analyses and assessments designed to promote best practices and effect institutional change within AT&L and throughout the Department. It relies heavily on FFRDC and contractor staff assets to accommodate its statutory and non-statutory requirements, delivering a range of products and recommendations optimized to balance consistency against change in acquisition processes in order to net a greater return on investment in defense acquisition dollars.

Attachment A: Organization and Staff

PARCA was created within USD(AT&L) in December 2009 to comply with section 103 of the Weapon Systems Acquisition Reform Act (WSARA) of 2009, Public Law 111-23. On January 4, 2010, the Deputy Secretary of Defense appointed Mr. Gary Bliss as the first director. PARCA began with two divisions that performed the WSARA statutory functions: a Performance Assessments Division and a Root Cause Analyses Division. In 2011, PARCA established and staffed divisions for the Earned Value Management and the Acquisition Policy Analysis.

The goal for this organization is to staff each PARCA division with a Senior Executive Service (SES) equivalent deputy director. At this time, the PARCA director is an SES, as are the deputy directors for the non-statutory Earned Value Management and Operations divisions. The arrival in May 2013, of a limited-term senior executive as Deputy for Root Cause Analyses greatly contributed towards meeting the organizational goal, but the departure 5 months later of the Deputy for Performance Assessments offset this gain. This latter position has not been filled by a senior executive and is instead occupied by an acting GS-15 equivalent. Government billets and leadership positions in PARCA remain subject to Defense-wide personnel policies and constraints. Pending relaxation of restrictions, then, one deputy director of the two statutory divisions will remain a temporary Senior Executive, and the other will be a GS-15 equivalent acting as the Deputy for Performance Assessments. The deputy director of the newer, non-statutory APAC division is an IPA detailee.

Collectively, PARCA has a staff of approximately 32 full-time equivalents, of which eight are Government billets. General staff support is provided by FFRDC researchers and Systems Engineering and Technical Assistance contractor personnel.

Appendix 1: August 10, 2011, USD(AT&L) Memorandum

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

ACQUISITION, TECHNOLOGY AND LOGISTICS

AUG 10 2011

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
DEPUTY CHIEF MANAGEMENT OFFICER
COMMANDERS OF THE COMBATANT COMMANDS
DIRECTOR, COST ASSESSMENT AND PROGRAM EVALUATION
DIRECTOR, OPERATIONAL TEST AND EVALUATION
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE
ASSISTANT SECRETARIES OF DEFENSE
ASSISTANTS TO THE SECRETARY OF DEFENSE
DIRECTOR, ADMINISTRATION AND MANAGEMENT
DIRECTOR, NET ASSESSMENT
DIRECTORS OF THE DEFENSE AGENCIES
DIRECTORS OF THE DOD FIELD ACTIVITIES

SUBJECT: Earned Value Management (EVM) Systems Performance, Oversight, and Governance

EVM is one of DoD's and industry's most powerful program management tools. EVM is primarily a program management planning tool which is also used by government and industry program managers to track program execution as they navigate the day-to-day constraints and risks that all DoD programs face.

This memorandum provides guidance that will improve the effectiveness of EVM across the Department. To be successful, EVM practices and competencies must be integrated into the program manager's acquisition planning and execution processes; the data provided by EVM must be accurate, reliable, and timely; and EVM must be implemented in a disciplined manner.

The Office of Performance Assessment and Root Cause Analysis (PARCA) was created in December 2009 as the principal DoD office for conducting performance assessments and root cause analyses of Major Defense Acquisition Programs (MDAPs) as statutorily required by the Weapon Systems Acquisition Reform Act (WSARA) of 2009, Public Law 111-23. A key element of PARCA's statutory responsibility entails evaluating the utility of performance metrics for cost, schedule, and performance of MDAPs. The implementation and use of EVM across the Acquisition Community falls within PARCA's area of responsibility.

PARCA is responsible and accountable for EVM performance, oversight, and governance across the Department. Specifically, PARCA will:

- Develop, publish, and maintain DoD policy and guidance on EVM;

- Resolve differences in interpretation of EVM policy, practice, and requirements among DoD Components;
- Maintain communications with industry on EVM policy;
- Represent the Department in resolving differences with other Federal agencies;
- Be responsible for the Earned Value Central Repository (CR) for the Department and maintain CR data alignment with the Acquisition Visibility framework;
- Review and approve EVM data requirements for MDAP programs with initial focus on ACAT ID programs and follow-on emphasis on other programs in close coordination with the Services and Defense agencies.
- Report EVM data compliance, integrity, and quality to the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics.
- Serve as EVM Functional Lead and, as such, support other OSD Defense Acquisition Workforce Improvement Act Functional Leads with EVM expertise to influence the competency requirements for Earned Value within their respective functional areas. Coordinate with DAU to execute the responsibilities outlined in DoDI 5000.66.

Although primary EVM acquisition and procurement policy matters will be the responsibility of the Director, PARCA, EVM implementation is the responsibility of the acquisition leadership throughout the Department. Toward that end, PARCA will coordinate and publish a roles and responsibilities document using the attached memorandum and the results of the Defense Support Team Report as a starting point.

The Defense Contract Management Agency will retain responsibility for EVM System Compliance for the Department, with the Defense Contract Audit Agency's support, except for those DoD Components that are also part of the Intelligence Community and are excluded from the requirement to delegate EVMS authorities to DCMA.

In addition, PARCA will maintain a DoD EVM Integrated Planning Team with representatives from all relevant DoD agencies.

Thank you in advance for your support of this important initiative. My point of contact is Mr. Gordon M. Kranz at 571-256-0646.

Ashton B. Carter for 8/10/11

Attachment:
As stated

cc:
USD(AT&L) Direct Reports

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

ACQUISITION, TECHNOLOGY AND LOGISTICS

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.

Attachment:
As stated

DISTRIBUTION:
SECRETARIES OF THE MILITARY DEPARTMENTS,
ATTN: ACQUISITION EXECUTIVES
COMMANDER, U.S. SPECIAL OPERATIONS COMMAND
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CHAIRMAN OF THE JOINT CHIEFS OF STAFF
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DEPUTY UNDER SECRETARY OF DEFENSE (ACQUISITION AND TECHNOLOGY)
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DIRECTOR, DEFENSE PROCUREMENT AND ACQUISITION POLICY
DIRECTOR, SYSTEMS AND SOFTWARE ENGINEERING
CHAIRMAN, COST ANALYSIS IMPROVEMENT GROUP

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.

- 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.

Appendix 2: Performance Assessments

- CHEM DEMIL ACWA (Nunn-McCurdy)

PARCA identified two root causes for the Nunn-McCurdy breach: the first accounting for one-quarter of the cost growth was due to factors exogenous to the program; and the second was that the Government did not follow adequate acquisition rigor to deal with uncertainty and risk inherent in large construction projects like ACW A, which develop and use new processes, handle dangerous materials, and are subject to comprehensive regulation. The Cost Assessment and Program Evaluation (CAPE) cost estimate created during Nunn McCurdy certification included significant costs for these risks, and the FY 2013 PB includes additional MILCON funding to be consistent with the CAPE estimate. The program has continued to retire some risk and is now rigorously monitoring burndown of remaining risk. Original cost estimates were established when designs at the Pueblo Chemical Agent-Destruction Pilot Plant (PCAPP) and Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP) facilities were 60 percent and 13 percent complete, respectively. Both designs are now complete and construction is 98% complete at PCAPP and 60% complete at BGCAPP. Our RCA also described a lack of contractor incentive to reduce program uncertainty and cost. To further incentivize the contractors to complete agent destruction operations in a safe and accelerated manner, the program office initiated discussions with the contractor to implement the special milestone incentives authorized by the FY 2007 NDAA. These incentives ($164M) were incorporated in the contracts prior to 4Q FY 2012; however, the FY 2013 continuing resolution funding restrictions have impacted these contract actions.

- EELV (Nunn-McCurdy) 1

This memorandum summarized the first assessment of the Evolved Expendable Launch Vehicle (EELV) program, which was recertified as an ACAT 1D program on July 12, 2012. PARCA's June 2012 root cause analysis identified three root causes that resulted in the breach: the inherently unstable nature of the demand for launch services; the international space market and industrial base issues; and poor program execution due to an environment with little incentive for cost control for the content not associated with the fixed infrastructure. The first two root causes were exogenous and beyond the program's control. PARCA believes an acquisition strategy that ensures a sufficient pool of competitive launches and a contract strategy that addresses enterprise fixed costs are important factors in addressing the third root cause. While an alternate launch provider's ability to meet new entrant certification criteria is the first barrier to competition, there is danger of additional barriers if funding, schedule, and national security issues erode the pool of 14 cores in potentially competitive launches. Furthermore, the program's ability to control fixed costs will significantly impact the government's ability to realize cost savings from ULA and future.potential competition for launch services. High fixed costs are also contrary to the need for agility as launch demands change.

- EELV (Nunn-McCurdy) 2

This memorandum summarized the second assessment of the Evolved Expendable

Launch Vehicle (EELV) program, which received MS C re-approval on February 10, 2013. PARCA's June 2012 root cause analysis identified three root causes that resulted in the breach: the inherently unstable nature of the demand for launch services; the international space market and industrial base issues; and poor program execution due to an environment with little incentive for cost control for the content not associated with the fixed infrastructure. The first two root causes were exogenous and beyond the program's control. PARCA believes an acquisition strategy that ensures a sufficient pool of competitive launches and a contract strategy that addresses enterprise fixed costs are important factors in addressing the third root cause. There are two upcoming phases of competition for the EELV program that are contingent upon certification of a New Entrant. Furthermore, the Air Force Program Executive Office for Space Launch has no long-term concerns related to the launch forecast and believes the EELV program is well suited to react to changing launch manifest requirements. Finally, the Air Force continues to examine options to restructure EELV Launch Capability efforts to allocate discrete and unambiguous costs to each launch vehicle and payload.

- F -35 Joint Strike Fighter (Nunn-McCurdy)

The F-35 program continues to aggressively confront the large number of issues inherent in a complex development program. System development issues such as the Arresting Hook System (AHS), the Helmet Mounted Display System (HMDS), Envelop Expansion, and Fatigue Life are ongoing as new challenges are introduced. The program has made substantial changes that put it on a more realistic path to address significant development and production cost challenges, but subsequent performance has included schedule slips and delays to critical software releases. Software development, production costs, O&S costs, and certification testing remain a risk. PARCA will continue following flight test progress, production rates, costs, deliveries, and challenges associated with program concurrency.

- Global Hawk (Nunn-McCurdy)

The FY13 budget drastically changed this program by effectively terminating Block 30 and delaying the GSRA/CSRA subprogram initiation. The uncertainty created by the FY13 budget and by subsequent congressional language has made it difficult to establish meaningful baselines, requirements or long term planning. This makes sound investment decisions in the areas of reliability, maintainability, support, and modernization a challenge. With the exception of Material Reliability, performance metrics on the Global Hawk Block 30 have improved or stabilized since the June 2011 Nunn-McCurdy certification to continue.

- Global Positioning System - GPS (Info Memo)

This memorandum assessed the health of the Global Positioning System (GPS) constellation and identified key challenges representing significant risk to maintaining worldwide GPS coverage. These challenges include: delays in creating the next generation of ground control segment (OCX) and how these delays impact the replenishment of the constellation with new GPS III satellites; aging of the GPS constellation and the importance of IIR satellites for a healthy constellation; and planning for contingency operations, which would

mitigate risk to the constellation. The OCX schedule continues to slip from the original baseline, with current estimates approaching the Air Force estimate for when the constellation must be replenished with an operational GPS III satellite. Currently, the OCX Block 1 ground segment is required before a GPS III satellite can transmit a legacy signal. As aging IIA and IIR satellites are retired from the constellation, GPS III satellites and the OCX ground segment will be needed to meet constellation requirements. As the IIA satellites will be replaced before the IIR satellites, these IIR satellites must be maintained since their health is likely to drive overall constellation health until the GPS III and OCX ground segment become available. Contingency operations would be a modification to the current ground control system, allowing use of GPS III satellites before the delayed OCX Block 1 is completed.

- Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS) (Nunn-McCurdy)

PARCA's 2012 Root Cause Analysis identified four reasons for the Nunn McCurdy breach. Three causes exogenous to the program accounted for 190% of PAUC growth (the decision by the Army to eliminate all planned production, the Secretary of Defense's direction to participate in a Combatant Command exercise, and an Army decision to extend JLENS EMD by 12 months to support the Army Integrated Air and Missile Defense program). Engineering challenges accounted for the remaining 15% of cost growth. Since PARCA's December 2012 Performance Assessment, the program has completed two Early User Testing at Utah Test and Training Range. The first test result was that JLENS is operationally effective with limitations; not suitable in the areas of Reliability, Availability and Maintainability and MANPRINT; and is survivable with limitations. There were 29 system aborts in the first test. Root causes of 24 of these aborts have been resolved. The radar system can detect targets, provide accurate tracks, and potentially support the Army's Integrated Fire Control network; however, the soldier operators were poorly trained, the software was underdeveloped with undocumented work-arounds, and the system lacks Cooperative Engagement Capability integration and certification. The system has not met Electromagnetic Environmental Effects measures and has low availability. JLENS is a stand-alone system with no funding to support further development. After EUT testing, Orbit 1 will be moved to Aberdeen Proving Grounds to participate in exercise Noble Eagle. Orbit 2 will be stored at White Sands Missile Range in FY2014.

- MQ-1C Gray Eagle (FRP)

The Gray Eagle is an Army ACAT IC program that provides tactical intelligence, video, imagery, communications relay, and precision missile support to Army maneuver units. The Gray Eagle completed Initial Operational Test and Evaluation (IOT&E) in August 2012 and was found to be operationally effective and suitable. As a result, the program was authorization to procure up to 49 Gray Eagle UAVs and delegated from an ACAT ID. During IOT&E, the program achieved Combat Availability requirements despite failure to meet subsystem reliability attributes, which have subsequently been revised to be consistent with O&S funding levels.

- P-8A Poseidon (FRP)

This memorandum provided an assessment of P-8A Poseidon (P-8A) program performance issues ahead of the imminent Full Rate Production (FRP) authorization decision. P-8A is a Navy Acquisition Category ID program that achieved Milestone C in August 2010. Of a total planned procurement quantity of 117, 85 (73 percent) remain to be procured through FRP. The P-8A airframe represents an improvement over the legacy P-3 airframe, and maintaining the production schedule reduces the risk for the fleet transition from the legacy P-3, allowing the Navy to maintain operational capabilities. However, hardware/software integration issues have resulted in mission area deficiencies that must be mitigated. The Navy's incremental strategy addresses these issues, but contains known risks.

- RMS (Nunn-McCurdy)

This memorandum summarized the fourth assessment of the Remote Minehunting System (RMS) program, which was certified for continuation on June 1, 2010. PARCA's May 2010 Root Cause Analysis identified three reasons for the Nunn-McCurdy breach: a decrease in quantity; an unrealistic cost estimate; and poor program management and governance, particularly a failure to effectively address the Remote Multi-Mission Vehicle's (RMMV's) insufficient reliability. Since the 2010 Nunn-McCurdy breach, significant improvements have been made with the program. The last phase of V4.2 In-Water Testing is underway with preliminary data implying that V4.2 will meet the 75 hour Mean Time Between Operational Mission Failures RMMV Material Reliability requirement. The Program Office anticipates completion of V4.2 In-Water Testing in July, 2013. The program is likely to meet its RMMV reliability requirement without a V4.3 design iteration, leaving AN/AQS-20A reliability as the major hurdle to the RMS Operational Availability requirement. Shipboard testing on a Freedom Class seaframe is an important outstanding requirement. The program is on track to meet the May 2014 objective for MS C. An RMS Operational Assessment, a prerequisite for Littoral Combat Ship Mission Module Initial Operational Test and Evaluation, is planned for early FY14.

- SM-6 (FRP)

The SM-6 is a solid propellant, tail-controlled surface to air missile, which incorporates a separate booster that enables air defense to theater ranges. The original December 2011 Full Rate Production (FRP) review was deferred to perform supplemental testing to validate corrections that caused two previous reliability failures. Three of five Key Performance Parameters (KPPs) will not be fully demonstrated until Follow-On Test and Evaluation (FOT&E); however, combined modeling and simulation (M&S) and land-based testing provide some confidence in meeting these KPPs. As of February 2013, the one large active Low Rate Initial Production (LRIP) contract was 57% complete, ahead of schedule, and under budget. The proposed missile buy profile ramp-up in FY2017 and beyond may not be affordable; therefore, PARCA recommended it be adjusted in the FRP APB. PARCA will follow the FOT&E results and production progress.

- WIN-T Increment 2 (FRP)

WIN-T Increment 2 takes the Increment 1 network capability mobile. The program has 932 of 2100 (44 percent) procurement units under contract. The FRP decision in September

2012 was deferred because the Director, Operational Test and Evaluation (DOT&E) found that the program had limited effectiveness, was not operationally suitable, and was not survivable. The program proceeded with a series of Corrective Action Plans and completed a Follow-On Operational Test and Evaluation (FOT&E) to address these deficiencies. Prior to FOT&E the Army lowered reliability requirement Mean Time Between Essential Function Failure (MTBFF) a second time. The FOT&E was completed in May 2013 with improvement to the Soldier Network Extension (SNE), the line-of-sight Highband Network Waveform, and the SATCOM Net-Centric Waveform. Other improvements included higher data throughput speeds and resolution of multiple information assurance issues. The FOT&E also demonstrated a number of remaining deficiencies. The SNE and Point of Presence nodes start and restart procedures were complicated and time consuming, and Combat Net Radio gateways and Vehicle Wireless Package did not support the Fire Support Officer. The Army needs to address the remaining limitations and develop a long-term plan to resolve these limitations.

Appendix 3: Root Cause Analyses

OFFICE OF THE UNDER SECRETARY OF DEFENSE
3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

ACQUISITION, TECHNOLOGY AND LOGISTICS

August 28, 2013

FOR: UNDER SECRETARY OF DEFENSE (AT&L)

FROM: Mr. Gary R. Bliss, Director, PARCA

SUBJECT: Root Cause Analysis of the Expeditionary Combat Support System Program

Purpose. This memorandum summarizes Performance Assessments and Root Cause Analyses (PARCA)'s root cause analysis of the Air Force's (AF) Expeditionary Combat Support System (ECSS) program, which was canceled by the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)) per an Acquisition Decision Memorandum (ADM) dated December 11, 2012, following the AF's cancellation recommendation on November 14, 2012. Specifically addressed are the following questions posed by Senators John McCain and Carl Levin in their December 5, 2012, letter to then-Secretary of Defense Leon Panetta: "What are the root causes of the failure of the ECSS program, and why did it take so long for senior management to recognize these problems and cancel the program?"

The Weapon Systems Acquisition Reform Act (WSARA) of 2009 provided seven specific underlying causes to consider when analyzing the root causes of cost, schedule, and performance shortcomings of a program and an eighth general category termed "any other matters." The ECSS program suffered from as many as six of the specific causes specified in WSARA. While multiple issues detrimentally impacted the program, this analysis aims to identify the root causes for failure of the program (i.e., causes that are by themselves determinative) and distinguish such root causes from the many symptoms or consequences arising therefrom.

ROOT CAUSES

Inception issue: unrealistic performance expectations. From the outset, ECSS was touted as "a new global vision for transforming logistics." It was portrayed as a program that would provide "end-to-end logistics transformation," replace "more than 420 aging systems," and serve "over 250,000 end users."[1] According to the AF Acquisition Incident Review Team, ECSS was conservatively estimated to be 28 times larger than any Enterprise Resource Planning (ERP) system previously and/or currently in development, as measured by its number of interfaces.

When ECSS was conceived in 2004, the Department of Defense (DoD)'s transformation strategy included promoting "evolutionary acquisition with spiral development (EA/SD)" as a

[1] ECSS was consistent with the Administration's approach to transform how the Department acquires new systems. President Bush, during the 2000 presidential campaign, advocated a "revolution" in weapon system acquisition "that would skip a generation of technology."

preferred acquisition strategy.[2] Ronald O'Rourke of Congressional Research Service identified three potentially significant issues posed by EA/SD: (1) ambiguous initial program description; (2) lack of well-defined benchmarks; and (3) funding projections potentially more volatile. PARCA's assessment is that the first two of these issues are principal root causes of the ECSS program's cost and schedule growth and ultimately its cancellation. That ECSS had an "ambiguous initial program description," which led to the most fundamental root cause of program failure:

> *The Air Force did not adequately understand, define and document its current "as-is" business processes, nor did it internally understand and define the new "to-be" business processes it sought to implement across its enterprise.*

In PARCA's view, the most important tenant guiding an ERP implementation is the principle that you are not buying merely a software application or new IT system; the critical product being procured is a new set of business processes for managing your enterprise. It is thus essential to describe and understand your "as-is" business processes, not so that those can be instantiated into the new system, but rather so that the value-added and non-value added elements of the "as-is" process can be determined and serve as the basis for the desired "to-be" architecture. Developing the "as-is" and desired "to-be" process maps is admittedly a difficult, costly, and labor intensive task, but it is essential for successful implementation. For a program on the scale of ECSS, implementation was extremely complex because, unlike the purchase of a new weapon system whose use can be compelled by introducing it to the field and retiring the legacy version, the "as-is" business processes conducted by the AF logistics enterprise must continue to function throughout the transition to the "to-be" state, otherwise mission failure will occur. Although there is ample evidence that the need for and scale of Business Process Re-engineering (BPR) required for ECSS was recognized by program management and AF senior leaders, the most fundamental source of failure was the inability to adequately define the "as-is" and "to-be" business processes at a scale at which they could be implemented effectively.

Execution issue: poor performance by Government or contractor personnel responsible for program management. Of the problems encountered by ECSS, the most profound problem was the inception issue described above.[3] Nevertheless, there were crucial shortcomings related to effective program management of ECSS that contributed to its failure. Briefly, these included:

- The earliest and most consequential program management failure was the decision to delegate the leading role in requirements development, translation, and allocation to the System Integrator (SI) contractor. Delegating the custom solution to the SI was described by the Deputy Director of Cost Assessment and Program Evaluation (CAPE) as one of the "perverse incentives for contractor performance," in the February 18, 2011, Independent Cost Estimate (ICE) of ECSS Increment 1. In addition, CAPE's ICE cites, "[A] track record

[2] The governing version of DoD Instruction 5000.2 (May 12, 2003) describes spiral development as a variation of evolutionary acquisition in which "a desired capability is identified, but the end-state requirements are not known at program initiation... requirements for future increments depend on feedback from users and technology maturation."

[3] A program impaired by unrealistic performance expectations and an ambiguous program description might nevertheless be salvaged through astute program management that, in particular, divides the effort into manageable pieces of content. As will be discussed below, ECSS tried, but failed, to do so.

of poor system integrator contractor productivity, with weak government program management" as a remaining future concern.[4]

- A related shortcoming was the failure to consistently apply the original acquisition strategy that specified that a commercial-off-the-shelf (COTS)-based ERP software system would be procured and implemented with minimal redesign and maximal reliance on process optimization through BPR.[5] The failure to sustain the original strategy resulted from the AF's failure to adequately map the "as-is" and "to-be" business processes described above. In the absence of such a mapping, it was simply easier during the development process to accede to desires of technical experts (i.e., Government logistics functionals charged with describing process needs and corresponding reports, interfaces, conversions, and extension requirements and SI counterparts charged with responding to such requirements), rather than draw a hard-line on software redesign. A lesson applicable to future ERPs is that leadership needs to unambiguously communicate and enforce the principle that BPR is strongly preferred over software modifications, not only at the program management office (PMO) level but at senior levels within the acquisition and functional chains.

- A third execution issue related to poor program management was the failure to adequately collect and assess performance metrics on ECSS, particularly from 2007 – 2009. TAB 1 provides additional details and evidence related to this issue. As discussed above, ECSS suffered from as many as six of the WSARA-specified causes, each of which deleteriously impacted the program. However, PARCA's assessment is that the determinative root causes are those described above; other issues can more appropriately be characterized as symptoms and consequences of these root causes, as detailed in TAB 2.

BEYOND ROOT CAUSES: DoD DECISION-MAKING

Why did it take so long for senior management to recognize these problems and cancel the program? Any proposed explanation of why it took "so long" to recognize problems and cancel any program is naturally subjective in an environment as complex as DoD acquisition, in which there are multiple decision-makers, stakeholders, and interests and expectations and requirements. In considering factors that led to the decisions to twice restructure (2009, 2011) and ultimately cancel (2012) ECSS, PARCA found it useful to consider the program's chronology in terms of the broadly categorized timeframes shown in TAB 3.

There were three key decision points at which cancellation of ECSS was seriously considered (Restructure 1 in September 2009; Restructure 2 in October 2010; and alternatives development in 2012, which resulted in cancellation). Another possible key decision point was

[4] A possible cause of the SI's poor performance was lack of personnel with ORACLE experience: documentation from May 10, 2010 (5 years after program initiation), cites lack of "ORACLE program management and technical types" at CSC as a program risk and indicates that 66 ORACLE experienced personnel were added since September, 2009.
[5] That this COTS-based strategy failed is perplexing not because it is unusual (indeed, many ERP implementations in the public and private sector have failed to sustain such a strategy), but instead because from the outset ECSS key leaders emphasized in briefings and articles the necessity of applying a COTS-based solution and robust Change Management effort, and AF senior acquisition and logistics leadership spoke out strongly in favor of adopting large-scale BPR to implement ECSS.

early in the program, when the AF became aware that the cost of integrating the original three software products proposed by ORACLE was significantly higher than anticipated.

The full motivation of decision-makers at these points is difficult to reconstruct now – over-optimism, a preference for the status quo, and justifying program continuation based on accrued sunk costs all seem to have played a part – but, the fact is decisions were reached to restructure the program in September 2009 and again in October 2010. During both restructures, improvements were made that resulted in better defined content broken up into more manageably-sized efforts. It is apparent that decision-makers from the Program Manager to the Defense Acquisition Executive exerted best efforts to make meaningful changes to enhance execution prospects and provide functionality that to this day remains required to modernize AF logistics and financial business processes. The "long" timeframe that preceded the ultimate decision to cancel ECSS was to some extent necessitated by the need to collect and evaluate execution metrics on the restructured program.

The termination decision on ECSS, as for any major acquisition program, had far-reaching consequences, not only for the AF's unmet requirements, but also for private sector participants. It was thus critical to allow adequate time to obtain compelling data that future costs of ECSS would exceed the value of expected benefits, not only to enable the best decision within the Department, but also to ensure a fact-based rationale for termination was provided to Congress and the public.

SUMMARY

As noted at the beginning of this memorandum, projects such as the ECSS program are inherently more about business process re-engineering than they are about technology implementations, and it is the former that is by far more challenging. The private sector has found precisely the same thing: costly so-called Enterprise Resource Planning (ERP) implementations in the 1990s were cited in many business publications as being two thirds unsuccessful. So these are difficult challenges for any enterprise – public or private – to meet.

Starting off without a clear understanding of the business processes, both current and future, while ceding to a third party the job of clarifying these processes, was a crucial shortcoming at the ECSS program's inception. This, combined with failing to enforce the implied business strategy, as well as failing to create metrics to status the project, ensured that success was unobtainable. PARCA notes that the Navy, with important differences in almost all these dimensions, was successful in implementing an ERP across its enterprise in the same time period. Its project was not without flaws, but it was built on three earlier pilot projects from which the Navy evolved a business model that it could live with.

Attachments:
As stated

Prepared by: Dr. Mark Husband, PARCA, 571-256-1686

Attachment 1: INADEQUATE PERFORMANCE METRICS

A critical management shortcoming of the AF's ECSS program was the failure to collect adequate metrics to measure performance and track risks. This was largely a consequence of the ineffectiveness of the integrated master schedule (IMS) to reflect an accurate picture of the project's prospective task assignments and completions going forward. This was especially true prior to the program restructuring resulting from the October 31, 2010, Declaration of a Critical Change. It is speculative whether collecting such metrics might have enabled management intervention that could have produced acceptable outcomes; however, failure to collect such metrics clearly made it much more difficult to assess the program's execution status, and it correspondingly increased the time it took for senior management to recognize and respond to problems (particularly prior to 2011). The February 18, 2011, CAPE ICE stated that a continuing concern in the future was "limited reporting of contractor cost information and poor government visibility into actual contractor performance." PMO documentation from January 5, 2011, indicates that prior to July 2010, the IMS provided "poor visibility of external dependencies...manual integration/poor reliability...and lacking critical path awareness." The poor application of Earned Value Management (EVM) on the SI contract is, at least in part, an explanation for poor visibility into contractor performance.[6] Although properly implementing EVM certainly does not ensure that program management will be effective, it provides a framework to enforce rigorous up-front planning and continuous monitoring of execution metrics throughout the program.

Other evidence that adequate metrics were not in place through 2009 includes PMO documentation from January 5, 2011, stating that prior to October 2009, metrics were "not integrated, missing objective trending," had "inadequate drill-down, and no critical path." Further evidence that metrics and cost tracking were inadequate through 2009 is provided in the December 23, 2009, ADM, which directed the AF to "place cost and software data reporting (CSDR) requirements on the existing contract with the ECSS SI." Finally, the considerable improvement in metrics collection and analysis resulting from the October 31, 2010, Critical Change restructure of the program is striking: a variety of execution metrics and contractor actual costs were collected and tracked in accordance with direction in the February 18, 2011, ADM that authorized additional funding for the program. By September 2011, it was clear from these metrics that the restructured program was still unable to meet execution benchmarks. A new set of alternatives was then developed and considered, culminating in the AF's recommendation to terminate ECSS in November 2012.

[6] The original August 31, 2005, ADM approving ECSS MS A included the following statement by the Milestone Decision Authority: "I approve the application of Earned Value Management on this Firm-Fixed Price ECSS MS A Phase contract. The EVM will be tailored to the specific requirements of the ECSS Systems Integration efforts." However, EVM was ineffectively applied early in the program (with the budgeted cost of work performed equal to the actual cost of work performed in every period) and eventually was removed as a contract requirement based on the following explanation in program office documentation dated December 15, 2010, that "the program evaluated the usefulness of EVM and determined it to be ineffective for FFP contract – terminated SI EVM requirement."

Attachment 2: SYMPTOMS AND CONSEQUENCES

PARCA considers the following problem areas to be symptoms and consequences of the determinative root causes. These problem areas are important for at least two reasons: (1) they represent missed opportunities (signals) to recognize that the program had significant deficiencies that needed to be addressed; and (2) many individuals involved with ECSS and knowledgeable about its history consider some of these problem areas to be causes of program failure.

Inception issue: unrealistic baseline estimates for cost or schedule performance. ECSS was a pre-Milestone (MS) B program, so it did not have a formal Acquisition Program Baseline. As such, one could reasonably argue that the baseline estimates were not unrealistic, because there was no official cost or schedule baseline. On the other hand, the earliest formal cost and schedule estimate—the MS A Service Cost Position (SCP) conducted in 2005—served as a significant basis for program expectations until a subsequent SCP in 2009 (for a planned MS B only for Increment 1) and the CAPE ICE following the Critical Change in February 2011. The MS A SCP, which was for all four increments of the program, was by the PMO's own account (December 15, 2010) "high risk – so briefed – and approved." (Describing a cost estimate as "high risk" can be considered synonymous with "best case" or, more pejoratively, "low ball," i.e., one should expect actual costs will exceed the estimate). Accepting significant risks in cost and schedule estimates was not unusual within the Department during that period, consistent with the Department's philosophy that transformation would ultimately save money and provide better equipment to Warfighters. Also, prior to the WSARA-levied requirements that increased the emphasis on MS A estimates, it was typical that a MS A estimate was coarse and/or quickly done, with the expectation that more fidelity would be available for the MS B estimate used to baseline the program.

ERP programs in both the public and private sector are notoriously difficult to estimate, particularly at the outset when the scope of the program is large and requirements are still poorly understood and defined. In addition, techniques and procedures for estimating such programs were in their infancy (arguably still are), and cost estimators have been driven to create and develop unique parametric cost estimating relationships that are different from typical DoD weapon system programs. It is possible that the 2005 MS A SCP was as good an estimate as could be expected, based on the knowledge at that time. PARCA's assessment, however, is that the estimate was most likely overly optimistic, particularly in its failure to recognize the custom coding likely to be required, the significant costs of Change Management/BPR, and the failure to recognize the costs and challenges associated with importing data from legacy systems.

Inception issue: immature technologies or excessive manufacturing or integration risk. An inception risk that yielded an unexpected integration issue emerged immediately after award of the first contract to ORACLE in October 2005. AF personnel and documents indicate that the award to ORACLE was based on an understanding that the original three software products proposed either already were or could easily be integrated by ORACLE. During execution, this integration issue surfaced and became a source of unexpected additional effort. According to sources familiar with deliberations at that time, the AF engaged in internal discussions whether to terminate and re-compete the contract but ultimately decided to continue the awarded contract.

Inception issue: other matters. Numerous interviewees familiar with ECSS cite the inappropriateness of the Firm-Fixed Price (FFP) contract vehicle as a contributing factor to poor program execution. According to PMO documentation from January 5, 2011, the Department mandated use of the FFP option using the Enterprise Software Initiative Blanket Purchase Agreement. A FFP contract vehicle is appropriate when the Government can very accurately define its requirements and desired product and the contractor is able to accurately estimate its costs; a FFP contract was not appropriate for ECSS because of its extremely large scope, poorly defined requirements, and potential for significant change requests (each of which exposes the Government to renegotiation risk). Multiple contract changes, necessitated by the large amount of software customization that arose as ECSS departed from its COTS-based strategy, effectively created conditions in which the contractor was reimbursed for all costs, without the Government obtaining the insights into contractor performance necessary for effective program management. Poor program management execution occurred in part because an inappropriate contract vehicle was used that did not provide adequate visibility into the SI's performance.

Execution issue: unanticipated design, engineering, manufacturing, or technology integration issues arising during program performance. Like virtually all programs, ECSS experienced unanticipated additions in scope that had significant impacts on cost and schedule. However, none of these additions is considered to have contributed to program failure or even to program shortcomings. The unanticipated (or inaccurately estimated) expense that was the largest source of estimated cost growth was related to importing and cleansing data from legacy systems that ECSS was designed to replace (estimated by the 2009 MS B SCP as $544 million above the MS A SCP). However, this expense was for a future effort that was not incurred prior to program cancellation, and PARCA thus does not consider it relevant to program failure.

A more significant unanticipated issue was the ever increasing emphasis on the role of ECSS in meeting the AF's Financial Improvement Audit Readiness (FIAR) requirements. While ECSS functionality was originally designed to support audit readiness, the program originally focused on logistics transformation and its associated benefits (e.g., inventory and supply chain management savings, modernization of business practices, retirement of obsolete legacy systems, etc.). As the timeline for meeting FIAR deadlines decreased, some emphasis within ECSS, understandably, shifted to its role in supporting the AF's efforts to meet FIAR goals. Interviewees indicated there was considerable sentiment among AF and OSD senior leaders to terminate ECSS during the review accompanying its Critical Change in October 2010. During this review, considering the prospects for restructuring ECSS so that it fielded functionality to support the AF's FIAR compliance requirements was not only inevitable, but also prudent. Several AF leaders who participated in such discussions noted that the newly enacted deadlines related to FIAR compliance and the potential for ECSS to support such compliance was a contributing factor in the Service's decision to continue the program in late 2010. Those same participants reported that a major consideration in the ultimate termination decision was the realization that even if ECSS had been restructured again and continued beyond 2012, it would not have been fielded in time to meet FIAR deadlines and the AF would still be required to fund maintenance of legacy systems that ECSS was intended to replace.

It is worth noting that PMO documentation from January 5, 2011, describes two significant elements of content that were "requirements increases" that contributed to ECSS cost growth: (1) a

logistics financial module (LogFins) that was assumed by ECSS in October 2008, from the Defense Enterprise and Accounting Management System (DEAMS); and (2) Product Lifecycle Management, which was included in the MS A SCP, but was "not well defined nor properly costed." Although the 2009 SCP for a planned MS B attributed $270 million of cost growth to these requirements, PARCA does not consider this added scope to be a cause of program failure, or even necessarily a deleterious action. Instead, the decision to assume those functions appear to have been carefully weighed based on technical considerations that sought to determine the most appropriate architecture for achieving the required functionality.

Execution issue: other matters. The large scope of the program, the program management team's failure to divide the effort into manageable pieces of content, and the resulting unremitting shifting of content between increments led to ambiguity about the costs and benefits of the various ECSS program increments. This allowed program proponents to emphasize, to logistics users and senior acquisition officials, extraordinary potential downstream benefits of ECSS without conveying a full appreciation for the costs associated with developing and procuring all of the increments. For example, despite USD(AT&L)'s specific direction to the AF in September 2009 (and again in November, 2010) to limit the scope of ECSS to Increment 1, PMO documentation (January 5, 2011) continued to portray ECSS benefits in terms of the original program scope (originally three, later four increments). PARCA views this as especially pernicious to the decision-making process, because the benefits of Increment 1 amounted to only $677 million (i.e., only a very small fraction (5 percent) of the projected benefits of the program as originally conceived ($12.3 billion)). Moreover, at this point, the latest cost estimate (2009 SCP for a planned MS B) covered only Increment 1; there was no existing cost estimate for the subsequent three increments which were to account for 95 percent of the benefits.

Attachment 3: ECCS PROGRAM CHRONOLOGY

- 2005 – 2007: Aborted program start due to two un-sustained protests. Significant events: MS A approval ADM signed August 31, 2005; COTS contract award to ORACLE in October 2005, followed by protest which was denied February 2006; SI contact award to CSC in September 2006, followed by protest which was denied March 2007.
- 2007 – 2009: Development and refinement of requirements and blueprinting led by SI, with limited Government visibility as a result of poor program management, inappropriate FFP contracting vehicle, and inadequate metrics and execution oversight.
- 2009 – 2010: First program restructure and subsequent execution, during which the program was restructured from three to four increments (which were better defined than at MS A). Most importantly, the September 28, 2009, ADM specifically directed the AF to limit "activities to those required to support a MS B decision for Increment 1 and to develop the associated Acquisition Program Baseline..." and also directed that "Increments 2 and beyond will be separate acquisition programs."
- October 2010 – December 2011: Second program restructure (Critical Change) and subsequent execution, during which Increment 1 was restructured from three to four "Pilots" and detailed "Enterprise Metrics" were established and monitored. Of note, the November 30, 2010, ADM directed that the AF "shall immediately cease activities for ECSS Release 2 and beyond." Because Increment 1 content was split into Pilots A – D, it is apparent this guidance reiterated the September 28, 2009, direction to limit activities to Increment 1.
- 2012: AF and OSD developed and considered alternatives to meet ECSS goals of logistics transformation and supporting FIAR compliance; ultimately the AF recommended, and USD(AT&L) approved, cancelling the ECSS program and modifying, modernizing, and sustaining existing legacy systems to meet AF requirements.

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ACQUISITION,
TECHNOLOGY
AND LOGISTICS

October 24, 2013

FOR: UNDER SECRETARY OF DEFENSE (AT&L)

FROM: Mr. Gary R. Bliss, Director, PARCA

SUBJECT: PARCA Performance Assessment of Distributed Common Ground System-Army Increment 1 (DCGS-A Inc 1)

Purpose. This responds to direction in House Armed Services Committee Report (HASC) 113-102 which accompanies the National Defense Authorization Act for Fiscal Year 2014 that the PARCA office coordinate on the Under Secretary of Defense for Intelligence's briefing assessing a Director of Operational Test and Evaluation (DOT&E) report on the Distributed Common Ground System-Army (DCGS-A) program.[1] PARCA's statutory role is to assess the performance of acquisition programs and determine root causes of cost growth for programs that exceed Nunn-McCurdy thresholds. Because PARCA has limited expertise analyzing operational effectiveness of systems, PARCA's Director met with HASC staff to ascertain congressional intent. He was advised that Congress intended PARCA to provide a performance assessment of DCGS-A, analogous to its statutory duties. PARCA's assessment thus focused on cost, schedule, and performance metrics and program management effectiveness. This memorandum summarizes PARCA's assessment (within time constraints imposed) and, upon release to Congress, is intended to satisfy PARCA-related requirements in HASC Report 113-102.

Background. DCGS-A Inc 1 (previously called DCGS-A Mobile Basic (MB)) is the Army's primary system for intelligence, surveillance, and reconnaissance (ISR) tasking of sensors, posting of data, processing of information, and using intelligence information about the threat, weather, and terrain at all echelons.[2] Prior to 2007, several Acquisition Category (ACAT) III programs were initiated with Program Executive Officer authorization to provide proofs of concept and develop requirements for what later became the DCGS-A program of record (POR). In December, 2007, to reduce life-cycle sustainment costs, these programs were consolidated into the DCGS-A MB program and designated as a pre-Major Automated Information System (MAIS) by OSD(NII). DCGS-A MB was designated as a MAIS program by OSD(NII) on March 29, 2010, and in March 2012 its Acquisition Strategy, initial Acquisition Program Baseline (APB) and Milestone C were approved by USD(AT&L). DCGS-A is fielded to every Army unit from the Company level to Echelon Above Corps. As of July 2013, DCGS-A Inc 1 has spent approximately $2.2 billion (TY) (including ~$0.2 billion on ACAT III programs prior

[1] "...the committee directs the Under Secretary of Defense for Intelligence, in coordination with Performance Assessment and Root Cause Analysis office, to provide a briefing by October 18, 2013 providing an additional assessment of the DOT&E report."

[2] Source: DCGS-A Defense Acquisition Executive Summary (DAES), July 25, 2013.

to 2007) and estimates it will spend an additional $3.4B (TY) in Procurement and research, development, test, and evaluation (RDT&E) investment funds to complete the POR.

Program Assessment. Defense Acquisition Executive Summary (DAES) reports and other program information collected by PARCA indicate that DCGS-A Inc 1 is generally executing in accordance with or better than its cost and schedule baselines. Based on the most recent July 2013 estimate, total program estimated acquisition costs have decreased from the initial APB by approximately 12 percent (from $5.9 billion to $5.2 billion, BY 2012). Major milestones have all been accomplished within 2 months of the schedule estimates in the initial APB. The most recent DAES Assessments by the Program Manager and OSD staff indicate DCGS-A Inc 1 is "Green" in all nine applicable DAES Assessment categories (two categories, Production and International Program Aspects, are not yet applicable). In addition to reviewing official documents, PARCA conducted interviews with Government program experts from OUSD(I) and OUSD(AT&L/C3&Cyber), each of whom reported that DCGS-A Inc 1 is performing well, with an effective program management team that has responded to challenges.

While metrics indicate that DCGS-A Inc 1 is executing well (particularly compared to other MAIS programs), this is after only 18 months execution from its initial APB. PARCA fully expects additional challenges will arise in the future. This does not mean there have been no problems; while its cost and schedule metrics are respectable, DCGS-A Inc 1 (like many MAIS programs) has shifted content to later blocks as it encountered technical challenges (e.g., the delay of TS/SCI capability from Release 1 to 2).

PARCA has assessed several MAIS programs, including most recently the Air Force's Expeditionary Combat Support System (ECSS).[3] As PARCA and others have noted,[4] DoD has a poor track record implementing IS programs. In its ECSS assessment, PARCA determined that the root cause of failure was the Air Force's inability to understand and define the processes it planned to implement, which was a fatal flaw for a program that was intended to transform the AF's entire logistics enterprise. Instead, the AF contracted with a lead systems integrator to develop, translate, and allocate requirements, essentially outsourcing the critical thinking that should be performed by the Government. Based on PARCA's assessment, the DCGS-A Inc 1 management team has avoided these mistakes: they are not attempting to transform an enterprise level process (i.e., how ISR is collected and who participates), but instead have maintained their original vision of providing commercial best of breed products to the ISR community with rapid upgrade cycles.

Assessment of DOT&E Report. PARCA was given the opportunity to coordinate and comment on draft versions of the DOT&E report prepared for Congress in response to HASC Report 113-102. PARCA's comments and suggestions were incorporated into DOT&E's final report and in PARCA's judgment the DOT&E report adequately addresses the operational performance areas stipulated in the HASC Report.

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[3] PARCA Root Cause Analysis of ECSS, Aug 28, 2013, available at: http://www.acq.osd.mil/parca/references.shtml

[4] See, e.g., GAO 11-53, "DoD Business Transformation Improved Management Oversight of Business Transformation Efforts Needed," October, 2010.

SUMMARY

Metrics indicate that DCGS-A Inc 1 is executing in accordance with its baseline cost and schedule estimates and the management team has been effective. In PARCA's judgement, the DOT&E report adequately addresses the operational performance areas stipulated in HASC Report 113-102.

Prepared by: Dr. Mark Husband, PARCA, 571-256-1686

INFORMATION PAPER ON FRAMING ASSUMPTIONS

Why Create and Track Framing Assumptions: To inform acquisition leaders about key program assumptions, stimulate discussion of their validity, and establish a context for program assessments.

Definition: A *framing assumption* (FA) is any supposition (explicit or implicit) that is central in shaping cost, schedule, or performance expectations of an acquisition program.

- A program generally should have a small number (3-5) of FAs with the following attributes:
  - *Critical*: Significantly affects program expectations.
  - *No work-arounds*: Consequences cannot be easily mitigated.
  - *Foundational*: Not derivative of other assumptions.
  - *Program specific*: Not generically applicable to all programs.

Who: FAs are created and "owned" by the PM and reviewed and approved by acquisition leaders.

When: FAs should be presented at Milestone (MS) A and B reviews. MS A FAs should be re-evaluated at MS B to account for program changes.

Where: FAs and their status should be included in DAB reviews and DAES reports.

How: PMs should identify FAs, continuously monitor their validity and use them in assessments.

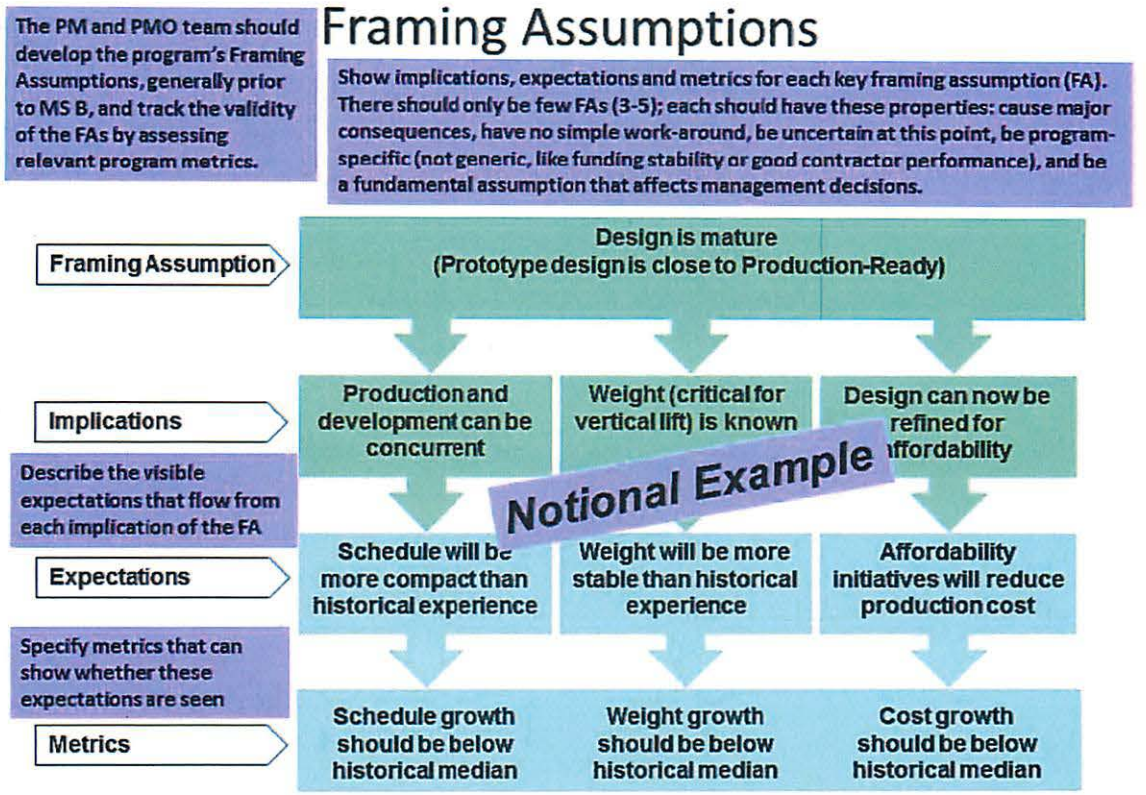
- In developing FAs, PMs should ensure they consider suppositions that are commonly believed to be true. When suppositions assumed true are in fact false, grave consequences may result.
- To use FAs as a management tool, PMs should identify associated Implications, Expectations, and Metrics. A format for presenting such information at DAB Reviews is shown in Atch 1.
- The validity of each FA should be monitored by tracking Metrics, Expectations and Implications during program execution.
- Because an invalid FA likely has multiple implications, FA tracking may provide early warning of unanticipated risks or issues.

Sources: Examples of good and bad FAs are provided in Atch 2. Some sources of FAs include:

- Technological and engineering challenges
- Cost, schedule and requirements trade-offs
- Effectiveness of program-specific managerial or organizational structures (particularly for joint or combined programs)
- Suitability of contractual terms and incentives to deliver specific expected outcomes
- Interdependencies with other programs
- Industrial base or market or political considerations

Attachments:
1. Framing Assumptions Briefing Slide Format
2. Example Framing Assumptions

Prepared By: Dr. Mark Husband, OSD/AT&L/PARCA, 571-256-1686, 13 Sep 2013



Attachment 1 to Information Paper on Framing Assumptions

EXAMPLE FRAMING ASSUMPTIONS

Good Examples. For an assumption to be central to a program's cost, schedule or performance expectations, it should have been considered and assumed true (explicitly or implicitly) during development of the program's requirements, cost and schedule estimates, and Acquisition Program Baseline (APB). Whether a FA is applicable to a specific program depends on whether it is inherent to the program's Acquisition Strategy and procurement environment. Following are some examples:

- Legacy performance requirements are adequate for this system.
- Threat levels will not significantly change in the next X years.
- Requirements will be relaxed as necessary to achieve cost and schedule goals.
- Development of X technology will achieve required performance levels.
- X, Y or Z sub-systems (or other integral components) can be developed independently.
- Re-use of X legacy components or Y subsystems will meet requirements and reduce cost.
- COTS or other NDE items can be easily adapted and/or integrated to meet needs.
- The mission equipment package configuration won't change during EMD.
- The prototype design is very close to production ready and will require few changes.
- System will be X (e.g., non-developmental, commercially derivable, COTS/GOTS based, etc.).
- The cost estimate based on X analogy is applicable to the EMD contract winner.
- Competitive prototyping will represent the end solution, reduce risk, and reduce unit cost.
- Contractors will offer mature designs that allow prototypes to be delivered in X months.
- Open system architecture and available technical data rights allow for competition.
- Carrying two contractors during EMD will reduce risk and lead to lower unit production costs.
- Down-selecting to a single EMD contractor will lead to lower costs and acceptable risk.
- Competitive environment will be maintained through X (e.g., EMD, LRIP, FRP, etc.).
- Commonality between variants will be at least X%.
- The government has sufficient knowledge and expertise to act as system integrator.
- Delay or cancelation of X, Y, or Z interdependent programs will not delay (or negate need for) this program.
- The X program will achieve IOC in time to use the systems procured by this program.
- Peculiar or specific management or organizational structure (contractor or government) will not lead to program delays or cost increases.
- Legal, diplomatic or political issues will not delay or prevent X, Y, or Z (e.g., EMD start, contract award, site selection, fielding schedule, etc.).
- Significant purchases by joint, interagency, or international customers will reduce unit cost.
- Significant commercial demand for this class of product will reduce unit cost.
- Commercial production at contractor's facility will not drop below X% of current levels, keeping overhead costs manageable.
- Commercial production facility can be adapted to meet program's needs at projected costs.
- Program Office can resolve competing priorities of different Services on joint programs.

Attachment 2 to Information Paper on Framing Assumptions

Bad Examples. FAs should be program specific—not generic assumptions that could be applicable to all programs. FAs should also not be facts—they should be uncertain postulates whose validity will generally be ascertained during program execution. Examples to avoid include:

- Cost (or Affordability), schedule, and/or performance goals can be achieved.
- Adequate funding will be provided.
- Requirements will remain stable.
- Capability is achievable (i.e., technologically feasible).
- The contractor and government program office will perform well.
- The operational need for the system will remain valid throughout its service life.
- The system will not be prematurely supplanted by advanced technology.
- Incremental development will lower program risks and/or costs.
- System deficiencies will be identified and fixed during testing.
- The system will be effective, suitable, and survivable.

Schedule or Event Driven?

How Do I Know?

Mark Husband, Dr.Eng.

Acquisition professionals know that program schedules should be established via "event-driven" planning. But what is the distinction between a schedule- versus an event-driven program? The author proposes that schedule-driven programs are distinguished not by whether they are behind schedule or have little margin, but by how management sets and controls schedules.

Schedules for event-driven programs are created by mapping out the entire set of activities that must be accomplished and determining their reasonable durations, while considering linkages and interdependencies between activities. In other words, an event-driven schedule is "built-up" by considering the time required to accomplish all the program's activities. In contrast, a program can be considered "schedule driven" if, for a fixed content, the schedule is determined and event durations are established based on fixed time constraints associated with the project's deliverables. One can conceive of schedule-driven programs in two categories: programs in which time constraints are imposed from the outset, and those in which revised time constraints are imposed during execution

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to "buy back" schedule slips or respond to externally imposed mandates. While the contrast between event- and schedule-driven programs is clear in theory, in practice all programs are subjected to fixed time constraints; otherwise each issue encountered would result in schedule slips corresponding to the time required to resolve that issue. Program managers (PMs) must continuously challenge their teams and industry partners to execute on schedule, even (or especially) when issues arise.

"Good" Versus "Bad" Schedule Goals

How might one distinguish between "bad" schedule-driven practices that harm programs and "good," aggressive program management that yields more efficiency and productivity? Schedule goals can be thought of as having one of two broad purposes: They are established either to ensure a given capability is delivered in accordance with a fixed timeline (e.g., the warfighter requires the system by a certain date or mission failure will result), or they are established based on considered planning and used as a management and statusing tool to ensure effective program execution. While actual schedule goals generally have a combination of these purposes, considering them separately allows one to make a value judgment: Goals established to accomplish a given content within a fixed timeline are "bad," as they yield a schedule-driven program. Such "bad" schedule goals may be imposed at program initiation (e.g., to meet a delivery timeline), or may be imposed on a well-planned program during execution as a response to schedule slips or externally imposed stimuli, thereby changing the program's character from event- to schedule-driven.

Of course, a fixed fielding date may be imposed on a program for legitimate reasons. During his tenure as Under Secretary of Defense for Acquisition, Technology and Logistics (USD[AT&L]), Dr. Ashton Carter said PMs sometimes need to consider a deadline as inviolable: "Think of it like a NASA planetary probe that has to rendezvous with the planet in 2017; if you don't make that date you have to wait another 50,000 years." Meeting treaty requirements is an example of a timeline that may be externally imposed on Department of Defense (DoD) programs (e.g., the Assembled Chemical Weapons Assessment program). Carter's Sept. 14, 2010, Better Buying Power memo decried "the leisurely 10–15 year schedule of even the simplest and least ambitious Department programs" and included an Initiative to "Manage Program Timelines." Negative consequences of extended program schedules are documented: substantial cost growth, late delivery of capability to the warfighter, and delivery of outdated technology and capabilities.

Just because a program is required to deliver capability on a fixed timeline does not automatically make it schedule-driven. Based on DoD's evolutionary acquisition construct, acquisition professionals should make trades between cost, schedule and performance to design programs delivering blocks of capability that satisfy needs incrementally, meeting users' timelines with an intermediate capability if full capability is unachievable. Also, in the author's view, the mere fact that a program has little schedule margin, or even has burned through its available margin and now is behind schedule, does not mean it is schedule driven. A schedule-driven program is one in which, for a fixed content, time constraints established for the deliverables are used to establish durations of the project's activities.

The mere fact that a program has little schedule margin, or even has burned through its available margin and now is behind schedule, does not mean it is schedule driven.

Establishing Dates for Program Deliverables

If a program were purely event driven, dates established for fielding its capability would be determined based on the system's performance requirements and the associated required development and production times. In practice, DoD programs never are structured with such unconstrained fielding timelines. Instead, programs compete for initiation via the Planning, Programming, Budgeting and Execution (PPBE) system; those programs with the most urgent requirements to fill a capability gap or replace a legacy system are selected for funding in the president's budget. Other prospective programs must wait until their associated need becomes more "urgent." That programs are selected for initiation based on a process in which "urgency" provides a competitive advantage is a hint that the programs selected likely have an inherent schedule-driven character. This "self-selection of the most urgent programs for initiation" phenomenon might be a good screening criterion for identifying schedule-driven programs. Programs promoted as the most urgent by the Service or Component are most likely to be schedule driven.

Ironically, some programs that are promoted as urgent and designed with a schedule-driven acquisition strategy don't appear in hindsight to have been as urgent as advertised. For instance, the Air Force and the Navy have commendably found ways to extend the service life of their tactical air fleets in the face of delays in the F-35 program, and the Army similarly has accommodated cancellation of the Comanche Helicopter and the Armed Reconnaissance Helicopter (ARH) through modifications and upgrades of its existing helicopter fleets. The Air Force tanker program was believed to be extremely urgent in the early 2000s, with claims that legacy tankers would soon "fall out of the sky"

and that rising operations and maintenance costs of aging aircraft represented a crisis. Neither claim proved true; the latter was disproven by the Air Force's own analysis. None of this implies that recapitalization and introduction of new and advanced capabilities are not vital to military effectiveness—because they are. However, programs designed with a schedule-driven acquisition strategy are much likelier to experience cost and schedule growth than if they are designed based on event-driven principles.

Before the 2009 Weapon Systems Acquisition Reform Act, DoD's institutional incentives favored adopting an optimistic program baseline. Doing so allowed the DoD to initiate more programs with its given resources, and some officials believed that adopting a challenging baseline put pressure on the program to execute more efficiently. However, there is a difference between being aggressive and being unrealistic. Being aggressive can be good: It challenges people to put forth their best efforts and ideas, to innovate, and to engage in continuous process improvement. However, aggressive but unrealistic goals frequently have negative consequences. They may cause people to take ill-advised shortcuts or give less than their best effort, because "the expectations are impossible anyway."

Schedule Compression

During a recent Defense Acquisition Executive Summary (DAES) review, USD(AT&L) Frank Kendall was briefed on a DoD Business System program that had encountered a 4-month slip of its contract award date. Rather than extend the period of performance to account for the delayed contract award, the program compressed its remaining schedule, which pressured the contractor to complete activities 4 months earlier than originally scheduled. Was this an example of schedule-driven behavior? Or good, aggressive program management?

In discussing the situation with the PM, the author learned that schedule pressures came not from acquisition leadership but from functional sponsors whose users are counting on the capability. According to the PM, the program was "schedule driven, with deliveries based on a schedule that wasn't executable." Stakeholders outside the program office argued that because the program baseline was issued before the contract award, extending the schedule would have necessitated changing the established baseline. To an acquisition professional, compressing a schedule as a result of a late contract award seems foolish—a clear indication of schedule-driven behavior. However, from the functional community's perspective, they have an approved capability requirement with an associated fixed timeline—in this case, the system is a part of efforts to achieve auditability in accordance with congressionally mandated timelines. In short, different interests and expectations among stakeholders lead to different perspectives about the best course of action (COA). Acquisition professionals are responsible for advocating COAs that posture the program for success, while recognizing that external stakeholder considerations (e.g., user-needs, policy, congressional or public interest concerns) may trump acquisition rationales.

While there are times when delivery dates are inviolable (rendezvousing with a planet) and times when external stakeholder considerations carry the day, acquisition professionals should recognize indicators of schedule-driven programs and advocate for event-driven strategies. The next section describes examples of programs initiated with schedule-driven constraints, while the following section discusses indicators that a program with an event-driven plan has adopted schedule-driven strategies in response to schedule slips or external mandates.

Constraints Imposed at Program Initiation

As an analyst in the Cost Analysis Improvement Group (CAIG) of the Office of the Secretary of Defense (OSD), the author observed several programs that appeared to be schedule driven at initiation. By far the most frustrating were instances in which knowledgeable program office personnel—e.g., engineers, cost analysts, contracting specialists and PMs—acknowledged privately that the planned program schedule was too optimistic, but explained that "their leadership" required it to be done that fast. During discussion of the cost estimates, analysts in the OSD often described the program as "schedule driven" or "overly optimistic," while the Service analyst described it as "aggressive" or "success oriented." A few examples will show how decision makers, with good intentions, can negatively influence a program through the desire to deliver capability faster.

In 2005, during initiation of the ARH, which was intended to replace the Bell OH-58 Kiowa helicopter, the program management team presented a plan to Army leadership to conduct a relatively rapid development effort of approximately 3 years (from Milestone [MS] B to MS C). Army leadership was not satisfied that the timeline adequately met warfighters' needs and pushed for faster fielding. Ultimately, the program was baselined in July 2005 with a 20-month development plan—much faster than any helicopter development program

in the CAIG database. In October 2008, the ARH program was terminated following multiple schedule breaches and cost breaches exceeding 40 percent. To date, despite several attempts, the Army has not initiated a follow-on replacement program for the OH-58.

Also in 2005, the Presidential Helicopter VH-71 program was baselined based on the Navy's cost position, which predicted a significantly shorter timeframe for development than the CAIG estimate. According to a 2011 Government Accountability Office report, VH-71 was "knowingly initiated with a high-risk business case ... the Navy adopted a two-step acquisition approach and initiated production at the same time it began development ... the program had a high-risk schedule because of concurrent design and production efforts." As with ARH, senior decision makers had good intentions to replace aging VH-3D and VH-60N helicopters and meet extremely challenging requirements on a very streamlined timeline. According to the 2007 Selected Acquisition Report by the program office, "The Increment 1 strategy purposely acknowledged a high schedule risk to meet urgent needs for safe and reliable Presidential transport." They could just as well have written "this program is schedule driven with an extremely low probability of success." VH-71 was canceled after an expenditure of nearly $3 billion and multiple schedule and cost breaches, and a follow-on program has yet to be initiated.

In the nonattribution environment of Defense Acquisition University, PMs frequently share experiences describing how unrealistic expectations are imposed on them by leaders or external stakeholders. The author has heard variations of the same story many times: A cost estimate and corresponding acquisition strategy are presented to flag officers or senior executives during the program initiation process, and the PM is given two great pieces of management wisdom: Lower the estimate and shorten the program timeline. In one particularly vivid example, a PM recounted how, during restructuring of the Space-Based Infrared System-High satellite surveillance program after its critical Nunn-McCurdy breach, the Secretary of the Air Force was presented three COAs and chose the one that had a 3 percent confidence level—i.e., a 3 percent chance of coming in at or below cost. According to program office personnel, the Secretary had been assured by a senior industry official that the aggressive launch date could be met. The bet didn't pay off, as the program experienced another schedule breach and was rebaselined.

Migrating from Event- to Schedule-Driven

Programs originally planned and initiated based on event-driven principles may become schedule-driven in response to delays or external mandates. The author proposes that indicators of schedule-driven behavior for such programs fall into one of several categories, skipping steps (or compressing the time for those steps); slipping content to the right, or adding content without appropriately recognizing schedule consequences.

"The Increment 1 strategy purposely acknowledged a high schedule risk to meet urgent needs for safe and reliable Presidential transport." They could just as well have written "this program is schedule driven with an extremely low probability of success."

The possibilities for engaging in schedule-driven behavior by skipping or compressing steps is limited only by one's imagination. Some examples:

- Curtailing tests
- Lowering standards or specifications (for products or processes)
- Increasing concurrency (concurrency may be planned at program initiation or may be introduced during execution in response to issues or mandates)
- Cutting analyses or assessments
- Reducing or eliminating reviews or oversight functions, including quality assurance or inspections
- Deleting or delaying reliability, cost-reduction, or sustainability efforts

Again, a few actual program examples will suffice to demonstrate schedule-driven behaviors.

Curtailing Tests. The Joint Tactical Radio System (JTRS) Handheld, Manpack and Small Form (HMS) Rifleman Radio (RR) program encountered unexpectedly poor reliability during Governmental Developmental Testing (GDT) that caused it to fall behind schedule and complete only 33 percent of the GDT that was planned to support the Initial Operational Test and Evaluation (IOT&E) readiness assessment. As a result, the Deputy Assistant Secretary of Defense for Developmental Test and Engineering DASD(DT&E) recommended the program resolve reliability issues and complete GDT before entering IOT&E. However, the program's IOT&E was part of a large Network Integration Exercise (NIE) involving multiple systems and operational units. Completing GDT and resolving the reliability issues would have required obtaining revised commitments from the test range and operational units, both of which are difficult to schedule. The absence of JTRS-HMS RR also would have negatively affected the planned NIE, which was created to test compatibility and interoperability of multiple

systems. As a result, Army decision makers chose to proceed to IOT&E before completing GDT and, not surprisingly, poor reliability was one of the findings in the resulting assessment by the director, OT&E. In recognition that recommendations based on poor DT results often are too late to affect decisions to enter IOT&E (because IOT&E budgets are set, ranges are reserved and operational units engaged), the ODASD(DT&E) has initiated efforts to obtain quality DT information earlier, to provide better, more timely information to decision makers.

Lowering Process Standards. The Capability Maturity Model Integration (CMMI) is a set of standards developed by Carnegie Mellon University, originally as a guide to software development, but more recently applied to assess business processes. During a discussion at DAU, a PM described how, after encountering schedule challenges, a program relaxed the required CMMI standards for software development, to speed up the work and regain schedule. If applying CMMI standards has value when the program is conceived and planned, then relaxing or rescinding those standards when the program encounters schedule challenges is clearly a sign of a schedule-driven program.

Increasing Concurrency. The VH-71 Kestrel Helicopter and F-35 jet fighter programs are examples in which excessive concurrency was part of a program's original acquisition strategy, making the programs schedule driven from the outset. The GAO Schedule Assessment Guide (May 2012) says "a schedule that contains many concurrent activities, unrealistic activity durations or logic, or a significant number of constrained start or finish dates is a common indicator of poor program performance." Alternatively, a program may become schedule driven by increasing concurrency of its activities. A program's schedule may be compressed as a result of well-intentioned efforts to improve efficiency, such as through Should Cost management. The CH-53K and B-2 Defensive Management System (DMS) programs developed plans to deliver capability sooner by compressing their schedules based on Should Cost approaches. However, their efforts were unsuccessful for different reasons—technical challenges prevented CH-53K from compressing its time to first flight and completing IOT&E as planned, while B-2 DMS had to lengthen its desired schedule because of near-term funding constraints.

Slipping Content. This may indicate schedule-driven behavior. In some cases, slipping content indicates good management—e.g., when intractable issues are encountered and the PM has authority to make trades between cost, schedule and performance. In other cases, slipping content indicates poor management, such as when delivered products don't meet user needs. Because it may occur for legitimate reasons, content slippage alone does not equate to schedule-driven behavior. Some instances in which content slippage may be associated with schedule-driven behavior include:

- Proceeding to IOT&E with nonproduction representative articles
- Executing tasks out of sequence in an attempt to maintain schedule, even when doing so results in significant scrap, rework or retrofits.

Adding Content Without Recognizing Schedule Consequences. You don't need much experience, just common sense, to realize that adding content to a program without adding schedule would be foolish. However, when content is added (be it "requirements creep" or an increase in program scale), it opens the opportunity for schedule-driven behaviors of the types already described—i.e., at initiation via the imposition of fixed timelines, or during execution whereby the consequences of the added content are not appropriately recognized. Program examples familiar to the author tend to involve disconnects or misunderstandings between the government and contractor concerning exactly what the added content entails. In such cases, the schedule consequences were arguably recognized by the government but inadequately communicated to the contractor or translated into contractually binding documents.

Conclusions

Schedule slips are important in assessing a program's progress and performance. However, schedule slips alone are not evidence of "schedule-driven" programs. Slips could be due to variations inherent in schedule estimation and the simple fact that "stuff happens." Instead, the author asserts that schedule-driven behavior is more specific: It consists of goal-setting choices management makes as programs are planned and initiated or while programs are executed. A program can be considered schedule driven if (1) its schedule is mandated at initiation; (2) it attempts to accelerate or "buy-back" schedule by compressing or skipping activities; (3) it detrimentally slips content solely to maintain schedule; or (4) it adds content without adding schedule.

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