

Report to Congress on Performance Assessments and Root Cause Analyses



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

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A handwritten signature in black ink, appearing to read "Gary R. Bliss".

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Purpose and Background

This report responds 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 the 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 producing 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, honest broker that recommends positive institutional changes and reform.

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 require the Under Secretary's attention. Typically chaired by the Under Secretary, 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 insights and recommendations from DoD-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. It nominates programs, briefs topics at the DAES meetings, contributes to the assessments of programs, and participates in the meetings themselves.

PARCA continues to utilize and refine earned value metrics. Such cost and schedule metrics are used both independently and in conjunction with data obtained from other OSD, AT&L and Service organizations. This practice strengthens DAES participation and insight into program status. The continuing practice of strengthening analytics is reflected in several 2014 efforts. For example, for the Joint Strike Fighter (JSF), PARCA memoranda served as a catalyst for the USD (AT&L) to meet with the JSF program leadership to address issues relative to early

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

production lot costs. Similarly, PARCA questioned and received clarification on the viability of the Global Positioning Service constellation given schedule challenges associated with subcomponents and development of the operating system software. For the Evolved Expendable Launch Vehicle, PARCA continues to monitor the current launch manifest and the number of competitive launches available for new entrants. Finally, as part of PARCA Full Rate Production responsibilities, PARCA challenged how to better capture and measure reliability for the Standard Missile Six (SM-6) program. SM-6 has since revised how it demonstrates reliability in testing. PARCA will continue examining methodologies to improve measurement reliability.

Performance Assessments Products and Accomplishments

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 eleven different categories. PARCA surveyed over 1,000 assessments performed by OSD staff over the last year to evaluate their consistency with the assessment guidance. The quality of assessments showed continued improvement, and greater than 94% were largely consistent with the guidance. PARCA also continues to monitor the new Defense Acquisition Guidebook to ensure it reflects the new DAES guidance and any associated process changes. As part of the revamped DAES process initiated by PARCA's Assessment Guidance document, PARCA performed formal written assessments of contract performance for all active MDAP major contracts.

The Performance Assessments division responds to USD (AT&L) and ASD(A) ad hoc requests. This year it provided earned value charts and graphs in support of key meetings among the USD(AT&L), ASD(A) and major DoD prime contractors. Additionally, it produced performance assessment memoranda on programs following Nunn-McCurdy certification and prior to Multiyear and Full Rate Production decisions as required by the 2009 WSARA legislation. Summaries of these assessments are included in Appendix 1.

All of these analytic accomplishments are part of PARCA's statutory requirements. We also completed five Performance Assessment Memoranda relative to the post Nunn-McCurdy certification, one Full Rate Memorandum associated with the full rate production decision as well as several hundred DAES assessments and input to over a dozen USD(AT&L)'s DAES meetings. Leadership recognition of PARCA's analytic contributions was demonstrated when the Under Secretary requested the PA division provide contract performance trend charts to a series of quarterly high level industry meetings held throughout 2014.

Performance Assessment Division 2015 Goals

PA will work beyond the EV/IMS arena as it implements and tracks affordability analysis and constraints and researches the more effective use of metrics such as reliability metrics. It will seek out best practices from other organizations and create and share tools applicable to performance assessments. It will maintain its superior position as a recognized leader in bringing situational awareness to the USD (AT&L) of MDAP performance and will build on last year's initiatives making fuller use of EV/IMS deliverables.

Root Cause Analyses Division

Root Cause Analyses Products and Accomplishments

Statutory Activities Performed by the Root Cause Analysis Division

Root Cause Analyses Performed. In 2014, PARCA completed statutory Root Cause analyses on two Navy MDAPs that experienced critical Nunn-McCurdy breaches: the Joint Precision Approach and Landing System Increment 1A (JPALS Inc 1A) program and the MQ-8 Vertical Take Off and Landing Tactical Unmanned Aerial Vehicle Fire Scout (VTUAV) program.

Updated Root Cause Findings. Table 1 provides a summary of findings from the complete set of 20 root cause analyses conducted by PARCA from stand-up of the organization in 2010 through 2014. These memoranda and their supporting technical reports are available at <http://www.acq.osd.mil/parca/references.shtml>.

Non-Statutory Activities Performed by the Root Cause Analysis Division

Framing Assumptions Implementation. PARCA continued to develop the Framing Assumptions concept as a means of informing acquisition leaders about key program assumptions, stimulating discussion of their validity, and establishing a context for program assessments. In 2014, PARCA worked with several program management offices to develop and/or refine their programs' Framing Assumptions as they prepared for a Milestone review. The USD(AT&L) approved PARCA's recommendation that a program's Framing Assumption shall be presented to the Milestone Decision Authority at Milestones A and B DAB Reviews. Guidance to that effect is included in the recent January 7, 2015 update to DoD Instruction 5000.02, "Operation of the Defense Acquisition System." This is a powerful example that demonstrates PARCA's root cause analyses findings are being used to improve DoD's acquisition system. Considering a program's Framing Assumptions prior to and at program inception should provide better visibility by acquisition decision makers into the "Big Bets" that are made when a program is initiated. It is also expected to lead to better situational awareness of program progress by managers during program execution.

Analysis of the Acquisition Workforce. Completed in 2014, this effort examined the feasibility of ascertaining relationships between characteristics and qualifications of the acquisition workforce and workforce productivity. 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 were briefed to the ASD(A) in August, 2014. Inadequate fidelity and reliability of data within the databases examined made it impossible to even test the hypothesis whether a correlation exists between acquisition workforce characteristics and productivity. For multiple reasons, it was not possible to place specific personnel in specific acquisition organizations conducting specific acquisition functions. The study then examined a more limited test case of a single Systems Command for which data were manually verified and

validated in partnership with the System Command's human resources community. Unfortunately, even for this test case, research was unsuccessful in identifying specific acquisition workforce characteristics that correlate with productivity or quality of products of the acquisition workforce. However, one positive outcome from the study was that it demonstrated to leadership the need to improve acquisition workforce related data and to create a capability to cross-match personnel in acquisition Key Leadership Positions with the programs to which they are assigned.

Better Buying Power 2.0 Initiative — Eliminating Requirements Imposed on Industry for which Costs Outweigh Benefits. The goal of this analysis is to improve efficiency and lower the cost of DoD and industrial performer operations by modifying or rescinding non- or low-value added regulations or statutes. Over the past year, PARCA has examined six DoD-related regulations and statutes identified by industry as having little or no value, and it has engaged eleven defense contractors in providing quantitative data related to five of the six regulatory areas. Results from this study were originally planned to be reported in the Fall of 2014. However, contractor data submissions and discussions continued through December, 2014. PARCA is preparing assessments of the contractor-submitted recommendations and vetting them with OSD stakeholders and expects to present coordinated recommendations to the USD(AT&L) in Spring, 2015.

Cost Growth Research. PARCA continues to examine causes of cost growth in DoD acquisition programs. In 2014, noteworthy findings were obtained from an analysis which examined Program Acquisition Unit Cost (PAUC) growth from FY 1969 – FY 2007 for all MDAPs for which cost growth data were accessible. A major new finding from this research was that the budget climate at the time an MDAP is initiated strongly correlates with program cost growth outcomes: programs initiated during lean budgets have approximately three times higher average cost growth than programs initiated during relatively accommodating budgets. The study also tested for a correlation between acquisition regimes and associated OSD oversight processes and cost growth and found no differences in regimes, except possibly for the Acquisition Reform Regime from 1994 – 2000 which had higher cost growth. The study results were presented to the Under Secretary who has cited these findings in speeches, noting their relevance to the current fiscal environment and implications for DoD in initiating programs in a lean budget climate.

Applications of Should Cost to Achieve Cost Reductions. The Better Buying Power Initiatives introduced in September, 2010, included direction to program managers to implement Should Cost management to drive productivity improvements in their programs. The Deputy Director for Root Cause Analyses completed a study begun in 2011 while he was at the Defense Acquisition University which documented successful applications of Should Cost by MDAPs. The results of this study are contained in an April-May 2014 Defense Acquisition Research Journal article. It describes how programs have implemented Should Cost, the types of savings programs have identified and realized, and best practices and lessons learned that may be adopted by other programs. The article is available at:

http://www.dau.mil/publications/DefenseARJ/ARJ/ARJ69/ARJ69_Husband.pdf.

Table 1: PARCA Root Cause Analysis Findings, 2010-2014

Root Cause Analysis Table

Statutory and Discretionary (Revised 1 December 2014)

Root Cause Analysis Table	WGS	ATIRCM	CMWS	RMS	AB3	DDG-1000	JSF	Excalibur	ACWA	RQ-4A/B GH	Newy ERP *	GCSS-MC *	JTRS GMR	FAB-T*	JLENS	P-8A *	EELV	ECSS *	JPALS	VTUAV	Totals	
Inception	Unrealistic performance expectations		X																X			2
	Unrealistic baseline estimates for cost or schedule							X	X	X	X	X										5
	Immature technologies or excessive manufacturing or integration risk		X										X									2
	Other											X							X			2
Execution	Unanticipated design, engineering, manufacturing or technology integration issues arising during program performance	X		X																	X	3
	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			9
	Other	X																X		X	X	4

NOTES

* Indicates a discretionary root cause analysis

As noted in the section on Outreach, below, promulgating lessons-learned from this body of research is major PARCA function. 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 twenty audiences in 2014. These included government-only forums, such as DAU courses, as well as mixed industry-government groups, such as the TechAmerica Foundation.

Root Cause Division 2015 Goals

The Root Cause Analyses (RCA) Division will continue to improve the ability of DoD to apply major PARCA findings on programs and systemic issues to the acquisition community. Specific objectives will be to demonstrate the efficacy of framing assumptions for improving cost estimates and decision making and to improve communication of results via the Web, conferences, and education. In 2014, initial results were provided to ASD(A) assessing industry comments on the Truth in Negotiations Act (TINA), submitted in response to the USD(AT&L) study: “Eliminating Requirements Imposed on Industry For Which Costs Outweigh Benefits.” In 2015, the RCA Division will expand its interactions with OUSD(AT&L) stakeholders (DPAP, MIBP, and DCAA) and OUSD(C)/DCAA to adjudicate industry comments on TINA and other areas and formulate recommendations to improve the acquisition system to ASD(A) and USD(AT&L). Finally, the RCA Division continues to investigate cost growth, with the 2015 effort focused on examining cancelled and truncated MDAPs and RDT&E cost growth to determine if general pathologies and recommendations for improvements can be identified.

Earned Value Management Division

The Earned Value Management (EVM) Division is responsible for EVM policy and implementation across the Department. EVM activities can be summarized in four critical areas: Policy, EVM Requirements Review and Tailoring, EVM Competency, and Management of the EVM-Central Repository (EVM-CR).

In previous PARCA Annual Reports we have discussed these functions, but the EVM Requirements Review is a new role. The goal is to obtain consistency in EVM practice across our MDAP portfolio. That is, a contractor reporting system is only as good as the terms that go on contract. Many times the field requests too much data, or data in a form that is not compliant. Thus, PARCA now reviews acquisition strategies, acquisition planning documents, and EVM deviation requests for EVM policy interpretation to advise senior acquisition officials on the proper application and tailoring of EVM on MDAP programs. In 2014, PARCA reviewed and provided comments on 39 acquisition strategies and advised 20 program offices on over 80 separate requests regarding the application of EVM.

Earned Value Management Division Products and Accomplishments

The EVM Division continues to influence EVM implementation across the acquisition enterprise. As the office responsible for EVM performance, oversight, and governance across DoD, PARCA challenges the integrated program management community to implement EVM in a way that is both beneficial and cost effective.

In 2014, the PARCA EVM Division accomplished key milestones which address objectives set forth last year. It updated the Subpart 234.2 Earned Value Management System section of the Defense Federal Acquisition Regulations Supplement (DFARS) which focuses on EVM application and EVMS implementation for contracts with work scope that can benefit from EVM methodologies. It recommended raising the current dollar threshold for when a

contractor's EVMS must fully comply with the ANSI-STD-748 requirements. This change emphasizes the need to use sound program management principles to manage all DoD contracts even if EVM is not warranted. It also developed a policy document that provides a consistent interpretation of the EVMS Guidelines in ANSI-STD 748C. Adjudicated in December, 2014, it will be published in early 2015. It provides the foundation for EVMS compliance reviews across the Department, significantly reducing the burden of compliance.

To demonstrate the use of EVM with agile software development programs, PARCA is working a collaborative venture with Government and Industry teams that are using the agile methodology. The goal is to deliver best practices for using EVM as a program management tool with the agile methodology, and current focus areas include baselining, measuring progress, incorporating requirements changes, and standardizing agile terminology. At its completion, PARCA will issue written guidance on EVM and agile software. In its functional leadership role, PARCA also conducted a survey of DoD EVM analysts to assess their number, career fields and locations across the Department. The result of the survey will influence mandatory course material for EVM analysts at DAU. Courses will be targeted to the 500+ EVMS analysts who need the training instead of directing training for over one thousand career financial managers. Additionally, PARCA published an updated role-based EVM competency model and supported key AT&L workforce initiatives including the Acquisition Workforce Qualification Initiative and the Key Leadership Program initiative. As a result, DAU has updated Program Management, Earned Value Management, Systems Engineering, and Information Technology competencies and course material to incorporate EVM. PARCA further conducted a variety of studies to assess and evaluate improved methods of combining EVM analysis with the integrated master schedule (IMS), with technical measures used by system engineers, and with risk measures used by program managers. The end result of these studies will be a role-based guide on how to use EVM to support other disciplines in the program office.

Earned Value Management Division 2015 Goals

The Earned Value Management Division plans to pursue several key initiatives for 2015. It will work with the Services and Agencies to socialize and roll-out the implementation of the DoD EVMS Interpretation Guide. And, it will complete the update to DFARS to clarify the application of EVM by ensuring EVM is applied only on contracts where EVM is warranted. This update is expected to significantly reduce the contractor's burden of reporting. It will likewise create guidance for executing EVM in an agile development environment to increase the probability of the program's cost, schedule and technical success. Guidance will provide DoD programs with suggested best practices to implement when EVM and Agile are both used. Last, it will support program managers by developing a guide that addresses EVM application, analysis and baseline development, as well as task tracking, responsibilities, and the timing of accomplishments.

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 was part of the USD(AT&L) Better Buying Power 2.0 strategic effort, and it continues to be a focus for PARCA. A major output of this effort is a continuing series of annual reports on analytic results measuring the institutional performance of the defense acquisition system. The second such report was released to Congress and the public on June 13, 2014. 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 and 3.0 initiatives: 1) achieve affordable programs by establishing affordability analysis policy and enforcing affordability constraints; and 2) reduce cycle time while ensuring sound investment decisions.

Acquisition Policy Analysis Center Products and Accomplishments

The APAC Division continued to develop new approaches for improving the Department's ability to measure institutional performance. For example, it used existing data on final contract margins and contract types to determine their effectiveness for price and schedule control. The results of APAC analysis and methodology development to date were published in the second annual report on the Performance of the Defense Acquisition System for which it was lead authors.² This included extensive updates of past analyses to provide continued monitoring and trend analysis.

APAC additionally supported the implementation and enforcement of affordability analysis and constraints as the Components learn how to execute such analyses in compliance with the new Interim DoDI 5000.02. It also supported the ongoing legislative initiative to streamline and improve acquisition statutes. Further, it identified a set of minor adjustments to existing data reporting streams that would provide significant increases in the Department's ability to monitor acquisition performance. Those adjustments are now being implemented at the direction of the USD(AT&L).

Acquisition Policy Analysis Center 2015 Goals

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

²See *Performance of the Defense Acquisition System, 2014 Annual Report*. Washington, DC: Office of the Under Secretary of Defense, Acquisition, Technology and Logistics, 2014. As of January 28, 2014: <http://www.acq.osd.mil/fo/docs/Performance-of-Defense-Acquisition-System-2014.pdf>

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 continued leadership of the strategic initiatives identified above, a major product will be the publication in 2015 of the third annual *Report on the Performance of the Defense Acquisition System*.

Front Office

A major 2014 PARCA initiative in support of Better Buying Power 3.0 has been to improve agility in the *acquisition, intelligence* and *requirements* institutions to better serve the needs of the warfighter and the expectation of the American taxpayer. 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 which sustains core force capabilities. PARCA leadership is working 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 among stakeholding communities to make these processes more valuable, timely and less costly. This will require migrating from fixed document interchanges to more transaction oriented processes which 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. PARCA is committed to opening the aperture so that all communities have improved situational awareness of events, timelines and changed circumstances, and it will create a decision generating process that as the dynamic environment changes will develop credible alternatives and vector them into the appropriate decision making venue such as the Joint Requirements Oversight Council (JROC), the Defense Acquisition Board (DAB) or the Deputy Secretary's Management Action Group (DMAG.) This process change will fundamentally alter interactions among the acquisition, intelligence and requirements communities by creating a dedicated communications and issue resolution mechanism.

Front Office Accomplishments

In 2014, PARCA led the acquisition community in developing key process improvements that will be refined over the long term to enable agility within and among the acquisition, intelligence and requirements institutions. The first mechanism PARCA chose to address is the Systems Threat Assessment Report (STAR) and related Critical Intelligence Parameter (CIP) paradigms. Pilots and demonstrations were held in 2014, and a new vision has been established among the stakeholders. The "dynamic" STAR (or DSTAR) is moving from a static printed document to an online assessment linked to threat library modules dynamically updated at specified intervals and at threat event changes. At the same time CIP policy and mandatory notification processes are being revised, and CIPs will be identified in initial capability documents. The new CIP breach mechanism and remediation process will be re-structured and adjudicated within an overall governance model now in development.

Taking these ideas further, PARCA identified one concept in commercially practice relevant to our institutional problems: “service level agreements.” For DoD application, PARCA prototyped and is piloting a service level agreement construct called an Acquisition Intelligence Support Agreement (AISA) which would be signed by representatives of the acquisition, intelligence and requirements communities to define and clarify the demand and timelines for intelligence support to programs, projects and activities. AISA development would occur as early as possible in the life of a project to promote a collaborative dialogue in assessing the feasibility and cost of desired operational capabilities while simultaneously considering relevant threat technologies.

A related construct to the AISA is that of the Agora or library card catalogue that would exist on a classified network as a secure database of AISA information. While not including the technical data referenced in each AISA, it would contain the who, what, why and where of the AISA and related documents to allow quick, comprehensive insight for acquisition decision making, strategic investments, gap resolution, technology forecasts and portfolio management. The purpose of the Agora is to promote “free-ridership” and increased threat-related situational-awareness throughout the acquisition sector. It also holds the promise of identifying opportunities to reduce redundancy and overall cost. PARCA developed these concepts, and war-gamed their application, in 2014. It is actively over-seeing pilot implementations in 2015.

AISA use would also make the need for Intelligence Mission Data (IMD) clearly visible when systems are architected rather than as systems are in development or production. It would enable acquisition executives to make IMD choices as they pertain to programs and portfolios and allow the Intelligence Community to identify and manage internal resources across the acquisition program lifecycle – neither of which is currently feasible. The Agora would push data to AISA signatories to inform of changes in threat, capabilities and technical achievements – advancing the goal of enterprise agility.

Front Office 2015 Goals

In 2015, PARCA will maintain its leadership role within the acquisition community as the Department moves to a more agile acquisition system which incorporates as early as possible in each phase of a program’s life cycle major changes in threats and technology. The AISA will be prototyped using several programs to test best practices in incorporating operational threat environment changes and to determine an appropriate set of responsible signatories. An AISA template tool will be developed to ensure a quick and easy way of displaying key data dimensions and schedules. This template tool is a critical piece that in turn will link programs and portfolios to a database of operational kill chain, industrial base, intelligence, and critical technology information. The Agora will be established for registering AISAs and providing access to threat libraries and IMD tools such as the Intelligence Mission Data Management, Analysis and Reporting System (IMARS.) And, PARCA will instantiate the governance model for managing these new components such as the AISA, Agora, DSTARs, threat libraries, etc. The governance construct will likely consist of a Joint Acquisition Intelligence Center (JAIC), an integrated office of acquisition, intelligence and requirements subject matter experts, and a senior coordinating body directed by a flag officer or civilian equivalent. The JAIC will serve as the executive secretariat of the flag level forum and as a key analysis center for maintaining

situational awareness of priority issues and for signaling the need to develop options and alternatives for use by seniors within existing venues such as the JROC, DAB and DMAG. It will likewise promote cross community best practices, business processes, information sharing and outreach activities, and it will be charged with central management responsibilities for its AISA, Agora, DSTARs and related components. Its main function, however, will be to support the decision generating mechanism for raising cross-community and cross-functional issues. Management specifics of these initiatives and processes are being developed for corporate approval and execution within the year.

Key PARCA Socializing Function: 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.

The Acting Deputy Director, Performance Assessments made several presentations to the DAU as well as to the National Defense Industrial Association Program Management Systems Committee (NDIA PMSC) Conference. He explained the contribution the USD(AT&L) nets from earned value assessments as well as related metrics that objectively provide insight into the status of programs. The Under Secretary's support of PARCA's work was aptly demonstrated when he requested that the PA Division provide contract performance trend charts to a series of Quarterly CEO industry meetings held over the past year.

The EVM Division works to improve the ability of acquisition professionals to use EVM data across the acquisition enterprise, increase the quality and utility of EVM data, and reduce contractor administrative burden of inefficient EVM use. PARCA increased outreach efforts to both government and industry engagements in 2014. It chairs a quarterly government EVM Integrated Planning Team (IPT) to discuss current and upcoming policy and guidance changes and to engage on issues the Services may be experiencing with EVM implementation. PARCA also supports private industry EVM forums to present policy and address EVM implementation challenges. In 2014, PARCA conducted joint training sessions with the Department's Cost Assessment and Program Evaluation officials for both government and industry representatives on EVM policy and on the use and tailoring of the Integrated Program Management Report (IPMR), and it conducted training sessions at selected government sites. PARCA also participated in three Army program events to advise on the use and set up of the EVM technical plan to support the Integrated Baseline Review (IBR.)

Root Cause analyses increase in value when their lessons are more widely disseminated and can be used to improve future acquisition outcomes. PARCA's Root Cause Analyses findings are available in their entirety on an OUSD(AT&L) website available to the general

public at <http://www.acq.osd.mil/parca/references.shtml>. The site also hosts supporting analyses from Federally Funded Research and Development Centers. In 2014, PARCA briefed its Root Cause analysis results to current and future program managers at DAU's Executive Program Management Course, to acquisition officers at the Eisenhower School (formerly ICAF), and to Navy cost analysts at a training symposium sponsored by the Naval Center for Cost Analysis.

The APAC Division provided formal and informal guidance on performance assessments and on the new affordability policy through an update of the Defense Acquisition Guidebook, Chapter 3.2. It likewise participated in publication development, talks and meetings on affordability and performance assessment.

PARCA's participation in conferences continued to be curtailed in 2014 due to budgetary constraints and restrictions on conference participation.

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. Our non-statutory work has been growing as a result of senior leaders' demands, but the statutory functions have not, and will never, be compromised to meet those demands.

A major source of these emerging non-statutory demands is the emerging PARCA roles in Better Buying Power (e.g., affordability) and institutional reform (e.g., DSTARS, AISA and Agora). In each case, however, a fine line is drawn: PARCA generates data-based insights and creative policy alternatives for decisionmakers to consider. PARCA itself, however, steps aside when it comes to implementation and decisionmaking on individual programs. PARCA intends to remain a small, focused, creative, analytic shop.

Appendix 1: Performance Assessments

- RMS (Nunn-McCurdy Update)

The Remote Minehunting System (RMS) is a mine reconnaissance system designed for the detection, classification, identification, and localization of bottom and moored mines in shallow and deep water. The RMS program was certified for continuation on June 1, 2010 and is currently past Milestone B in the Defense Acquisition System. This memorandum summarized the fifth assessment of the RMS program and addressed six areas: V4.2 In-Water Testing, AN/AQS-20A Reliability, AN/AQS-20A Pre-Planned Production Improvement (P3I), Developmental Testing (DT) and Operational Assessment (OA), RMS and Littoral Combat Ship (LCS) Integration, and the path to Milestone C. PARCA continues to monitor the following: AN/AQS-20A reliability, RMS/LCS Integration, RMMV LH&R, DT/OA test results, and the path ahead to Milestone.

- EELV (Nunn-McCurdy Update)

The Evolved Expendable Launch Vehicle (EELV) program acquires launch services to provide critical space support required to satisfy DoD warfighter, national security, and other Government spacelift missions while fostering interagency and commercial cooperation. EELV is a past Milestone C program that has demonstrated assured access to space with 75 launch successes since the start of the program. The memorandum addressed four areas: the recently awarded requirements contract, the status of the competitive launch pool, the status of new entrants, and recently released National Space Transportation Policy (NSTP). PARCA continues to monitor the following issues: the current launch manifest and how many competitive launches are available for new entrants to compete for, the certification status of new entrants, the implementation of the NSTP into the EELV program, and the Air Force's progress in developing a new launch vehicle engine.

- RQ-4 Global Hawk (Nunn-McCurdy Update) #1

This Unmanned Air Vehicle (UAV) is designed to provide continuous, high-altitude, long endurance, all weather, wide area reconnaissance and surveillance capability. The Global Hawk program has not received Milestone C approval due to persistent programmatic and budgetary uncertainty unrelated to the original Nunn-McCurdy Root Cause. At the beginning of 2014 PARCA stated that, given recent clarification in program direction, we would begin to evaluate program performance when a new baseline is established.

- RQ-4 Global Hawk (Nunn-McCurdy Update) #2

This was the second Global Hawk memorandum written by PARCA this year. The Global Hawk program has not received Milestone C approval as of 2014. Despite the 87,000 hours in "combat" operations and improved mission capable rate, the program continues to lack a long-term program baseline and is missing several key documents that are necessary for program performance measurement, including an approved Acquisition Program Baseline, Validated Block 30 and 40 requirement documents, and an Independent Cost Estimate. PARCA will begin

to evaluate program performance when a new baseline is established, presumably no earlier than 3rd quarter FY 2015.

- F-35 (Nunn-McCurdy Update)

This next generation strike fighter aircraft program is past milestone B and over 8,000 hours into development flight testing, while recently initiating its 8th Low Rate Initial Production (LRIP). The F-35 program has experienced continued growth in the System Development and Demonstration (SDD) contract Performance Measurement Baseline (PMB) and remaining schedule. The Unit Recurring Flyaway (URF) Cost Projections (derived from LRIP performance, excluding the engine) are approaching their respective targets, but early data for the C variant projects it will exceed its target by an estimated 10%. PARCA will continue following the SDD schedule and the URF trends as we look at performance in Lots 7-9 along with other program challenges.

- JASSM-ER (FRP)

JASSM-ER is a low observable, highly survivable, subsonic cruise missile which carries a 1000-pound class, hardened, penetrating warhead with a robust blast fragmentation capability. JASSM - ER was re-designated from an ACAT 1D program to an ACAT 1C on September 8, 2014 given the maturity of the program. The Director, Operational Test and Evaluation's May 2013 Initial Operational Test & Evaluation report rated JASSM-ER operationally effective and suitable with the program demonstrating all 4 Key Performance Parameters and all 11 Key System Attributes. No Follow-On Operational Test and Evaluation was required. Missiles met or exceeded sustainment metric goals; Materiel Availability was 100%; demonstrated reliability was 0.91 (above the Lot 4+ threshold value of 0.85); cost estimates were stable, there were no funding issues, and the program was executing well against the April 2011 APB. A key issue is the availability of the Anti-Jam GPS - SASSM (JAGR-S) v3, which may not be ready before the JAGR-S v2 is expended. The JPO is working with Lockheed Martin to create a mitigation strategy to plan for any shortfall. PARCA will continue to monitor the availability of the JAGR-S V3 and corrective actions to any production issues that may arise.

Appendix 2: Root Cause Analyses



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OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

May 23, 2014

FOR: UNDER SECRETARY OF DEFENSE (AT&L)

FROM: Mr. Gary R. Bliss, Director, Performance Assessments and Root Cause Analyses
(D, PARCA) *g/r/bliss 28 May 2014*

SUBJECT: Root Cause Analysis of the Joint Precision Approach and Landing System
Increment 1A (JPALS Inc 1A) Program

Purpose. This memorandum summarizes PARCA's root cause analysis of the JPALS Inc 1A program's cost growth which triggered a critical Nunn-McCurdy breach as described in the program's December, 2013 Selected Acquisition Report (SAR). That SAR reported a 104.3 percent increase in program acquisition unit cost (PAUC) and a 129.0 percent increase in average procurement unit cost (APUC) compared to the original and current baselines (which are identical).

- The SAR attributed the cost growth to "a reduction in total planned quantities due to the elimination of previously required shore-based training systems, an extension of the development program to include capability improvements, a lower and longer procurement profile, and increases in material costs."

Modest cost growth occurred on the baseline program. PARCA's methodology for all root cause analyses includes determining the extent and causes of cost growth of the program as it currently exists and assessing whether such a program would have triggered a Nunn-McCurdy breach if it were completed according to its current plan. PARCA assesses that existing PAUC and APUC growth of the JPALS Inc 1A program was on the order of 10%, divided primarily among three factors, including (1) underestimation of government and contractor SEPM personnel; (2) schedule slips resulting from shifts in test asset availability; and (3) extension of procurement and install profile by two years from the original baseline. A small amount of cost growth also results from past and on-going efforts to plan and propose a restructured program.

JPALS Inc 1A program compared to multi-increment JPALS capability. In assessing this program, it is important to understand the distinction between the JPALS Inc 1A Major Defense Acquisition Program (MDAP) and the full JPALS capability.¹ The approach in the original Acquisition Strategy was to acquire full JPALS capability via seven increments. Prior to program initiation, Inc 1 of this seven-increment program was further separated into two phases, 1A and 1B. Inc 1A was to field a JPALS ship based system onto sea-based platforms,

¹ As defined in original and revised Acquisition Strategies, approved July 17, 2007 and July 14, 2008, respectively.

while Inc 1B was to integrate JPALS onto operational sea-based aircraft. On July 14, 2008, JPALS Inc 1A was initiated as an Acquisition Category 1D MDAP. According to the revised Acquisition Strategy, follow-on Increments 1B and 2-7 were to have separate MS B decisions to allow the JROC and MDA the flexibility to “approve one increment of JPALS at a time as future capabilities and associated cost estimates are better understood.”

Navy’s proposed restructured program would change both capability and quantities compared to baseline program, but largely due to a common root cause. The Navy proposes to reduce JPALS Inc 1A quantities by eliminating procurement of previously required shore-based training systems. This quantity reduction accounts for a PAUC increase of ~30% and an APUC increase of 18%. The Navy also proposes to shift some development efforts originally associated with future Increments 3 and 4 into the restructured program’s baseline. This added content accounts for a PAUC increase of ~60%, but only marginally contributes to the APUC cost growth.² However, the Navy’s proposals to change quantity and shift content both result from a common root cause: the changing environment associated with civil and military precision approach and landing systems. Specifically, delays and ultimately suspension of the Federal Aviation Administration’s (FAA) plan to transition from Instrument Landing System (ILS) to GPS-based landing systems led to a cascading series of decisions by the Navy, Air Force and Army that account for the preponderance (~90%) of the cost growth of the proposed restructured program.³

JPALS Framing Assumption.⁴ For many years prior to initiating the JPALS Inc 1A program, Navy and Air Force officials closely coordinated with FAA officials on plans for developing and fielding GPS-based landing systems, including JPALS, to replace ground-based navigation aids. In hindsight, evidence indicates that a key Framing Assumption of the JPALS program was that GPS-based landing systems would replace ILS and that military aircraft would require such systems to ensure interoperability with civilian landing systems. As of November, 2005 when the JPALS Analysis of Alternatives (AoA) Update was approved, the FAA planned to begin phasing-down Category (CAT) I ILS in 2015, in favor of GPS-based systems. This is documented in the 2005 Federal Radionavigation Plan (FRP), which is a statutorily required document prepared jointly by the Departments of Transportation, Defense and Homeland Security. However, due to funding and technical issues, development of GPS-based systems progressed more slowly than anticipated, and in the 2008, 2010 and 2012 FRPs, no dates were provided for commencement of CAT I ILS phase-down. Most recently, the FAA’s FY13-17 Capital Investment Plan states that the “FAA plans to make an initial decision in 2014 whether to begin a drawdown of Category I ILS...” This changing environment, combined with fiscal

² A related issue is the consolidation of funding from planned future JPALS Increments (1B, 2, 3 and 4) into JPALS Inc 1A to support required government in-house systems engineering and program management (SEPM) personnel. This accounts for PAUC growth of ~10-20% and APUC growth of ~60%.

³ Two other issues are cited as proximate causes of cost and schedule growth in the December, 2013 SAR. PARCA assesses that the lower and longer procurement profile and the increases in material costs had only small effects on PAUC and APUC growth.

⁴ PARCA has observed from previous root cause analyses that cost and schedule growth often result when one or more postulates believed to be true at program initiation turn out to be invalid. We refer to these as “Framing Assumptions.”

constraints, appear to be the key reasons that the Navy, Air Force and Army have decided to terminate their efforts to integrate JPALS onto legacy aircraft.⁵

Performance. There appear to be no technical or fiscal issues associated with procuring and fielding the JPALS Inc 1A sea-based systems. Test results have exceeded expectations and the contractor has been awarded incentives for achieving Objective level capabilities. Evidence indicates that the delay in production and fielding of the JPALS Inc 1A sea-based system is not the result of system ineffectiveness. Instead it results from a timing gap between availability of the sea-based system and integration of JPALS onto the lead aircraft (F-35B/C), which in turn, results from the Navy's plan to terminate Inc 1B, which was originally intended to equip the lead aircraft.

Risks for future Cost Growth. While unanticipated technical issues can never be discounted, PARCA believes the greatest risk for future cost and schedule growth of the Navy's proposed restructured JPALS program is its programmatic interdependency with the F-35 program. Whereas the baselined program was scheduled to achieve Initial Operating Capability (IOC) in 2016 using an F-18E/F surrogate aircraft equipped with an Avionics Test Kit, the Navy's proposed restructured program requires that JPALS capability be incorporated in F-35 software drop Block 5, and IOC is not scheduled to be achieved until 2026. The Navy has attempted to mitigate risk by defining an EOC — Early Operational Capability, which is scheduled for 2020. Delays in F-35 software development will almost certainly translate into delays in integrating JPALS into the F-35, which would lead to cost and schedule growth of the JPALS program.

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⁵ Specifically, the Navy proposes terminating Inc 1B and adding development efforts originally planned for follow-on Increments 3 and 4 into the restructured Inc 1A program, including design improvements to provide manned and unmanned aircraft with autoland capabilities and to support F-35B/C and Unmanned Carrier-Launched Airborne Surveillance and Strike (UCLASS) shipboard testing.



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OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
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May 28, 2014

FOR: UNDER SECRETARY OF DEFENSE (AT&L)

FROM: Mr. Gary R. Bliss, Director, Performance Assessments and Root Cause Analyses
(D, PARCA) *GRB 28 May 2014*

SUBJECT: Root Cause Analysis of the MQ-8 Vertical Takeoff and Landing Tactical Unmanned
Aerial Vehicle Fire Scout (VTUAV) Program

Purpose. This memorandum summarizes PARCA's root cause analysis of the VTUAV program's cost growth which triggered a critical Nunn-McCurdy breach as described in the program's December, 2013 Selected Acquisition Report (SAR). That SAR reported a 55.2 percent increase in program acquisition unit cost (PAUC) and 71.5 percent increase in average procurement unit cost (APUC) compared to the original baseline and a 53.5 percent increase in PAUC and 49.2 percent increase in APUC compared to the current baseline. This memo describes causes for the larger of these figures, the 71.5% increase in APUC compared to the original baseline.

- The SAR attributed the cost growth to an "increase in warfighter capability and reduction in total air vehicle quantity."

Contributors to cost growth. The Navy reported¹ that prior year cost growth led to a 19% increase in the APUC, with the remaining 52% increase attributable to the proposed program restructure to procure the more capable MQ-8C air vehicle and reduce quantities from 168 to 119. However, the Navy's analysis is based on cost growth through December, 2012. PARCA assesses that existing APUC growth through December, 2013 was approximately 30%, roughly two-thirds of which is attributable to the seventeen year stretch of the production schedule compared to the original baseline, and one-third of which is attributable to cost growth associated with the MQ-8B air vehicle. The remaining APUC growth of approximately 40% is attributable to the Navy's proposal to reduce quantities and purchase the more capable MQ-8C, with roughly two-thirds of that increase due to quantity change and one-third due to the cost delta between the MQ-8C and MQ-8B.

Root causes of cost growth. To ascertain the root causes of VTUAV's cost growth one must ask *why the production schedule was stretched and why the Navy proposes to substitute the MQ-8C for the MQ-8B?* PARCA has identified two primary root causes that led to these decisions:

- Limited growth potential inherent in the MQ-8B airframe and performance limitations encountered in developmental testing of that system; and
- Low priority of the VTUAV program compared with other Navy funding requirements during the period leading up to the breach.

¹ March 10, 2014 VTUAV Program Deviation Report.

The MQ-8B is based on a commercial airframe, the Schweizer S-330, which was used on the predecessor RQ-8A program. However, to achieve the VTUAV program's requirements the S-330 airframe was extensively modified, including extending and improving the tail rotor, upgrading transmission components and the main rotor from 3 to 4 blades, and adding fuel capacity and stub wings for added payload and improved aerodynamics. These modifications took advantage of most of the growth potential of the S-330 aircraft, leaving little opportunity to enhance the system's endurance or incorporate additional sub-systems and payloads.

The Navy declared Initial Operating Capability of the MQ-8B in March, 2014, affirming it had attained performance requirements as defined in the Capability Production Document. Like many systems however, VTUAV encountered challenges during developmental testing that led to program delays. For example, the estimated date for completion of Operational Evaluation slipped repeatedly from August, 2008 to December, 2013, and Operational Testing was ultimately discontinued because of the Navy's decision not to purchase any additional MQ-8B air vehicles. Challenges encountered during developmental testing included: reliability; availability; supportability; communications relay; software development delays; shipboard compatibility problems; hot weather operations;² and restrictive ship wind envelopes.³ While the MQ-8B attained stated performance requirements, the Navy's decision to discontinue its procurement indicates it did not meet their overall performance needs, especially compared to the more capable MQ-8C air vehicle.

The slip in the VTUAV's production schedule by seventeen years (from 12 to 29 years) is due to multiple factors, one of which—slip to maintain alignment with the LCS schedule—is exogenous to the program. Other factors include an unrealistic baseline procurement profile (ramping in four years from 20 to 35 units per year and then ceasing production) and slips to accommodate MQ-8C development. However, a significant portion of the production slip is not attributable to these factors but instead results from an eight year production break followed by production at rates below economic order quantities. The Navy has cited funding constraints as an explanation for these slips. However, with an estimated APUC of \$22.4M (TY), the cost to avoid a production break would be relatively modest, indicating that the VTUAV's priority is low compared with competing programs.

Risks for future cost growth. Although PARCA's root cause analyses are primarily retrospective, we note that certain attributes of almost any MQ-8C-based VTUAV program could lead to future cost growth. Given the difficulties the MQ-8B encountered on the road towards IOT&E, MQ-8C may encounter similar issues during its three years of additional development effort (FY15-17). A separate factor that could lengthen future development efforts is that the extra margin afforded by the more capable MQ-8C makes incorporating additional capabilities much more attractive (and feasible) than was the case for the MQ-8B. Finally, the continuing low priority of the program is evidenced by the Navy's plan to procure six air vehicles per year over a 16 year period, beginning in FY2020 and ending in FY2035. Like the unrealistic profile in the original baseline, PARCA regards the proposed production profile as highly unlikely, considering the technological advancements that are rapidly occurring in this commodity class.

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² DOT&E Annual Reports, FY2009 – 2013 and Early Fielding Report, 24 Jun 2011.

³ DON, Commander Operational Test and Evaluation Force, Military Utility Assessment of MQ-8B VTUAV, 14 Mar 2014.