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ACQUISITION RESEARCH PROGRAM SPONSORED REPORT SERIES

Analyzing the Effects of the Weapon Systems Acquisition Reform Act

28 May 2014

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The purpose of this project is to analyze the effects of Title II Weapon Systems Acquisition Reform Act (WSARA) of 2009 on the Program Executive Office (PEO) Combat Support and Combat Service Support (CS&CSS). Our methodology includes a literature review as well as interviews with program office stakeholders. We review collected data to establish a correlation between WSARA implementation and how stakeholders perceive the application of these regulations through the following  Identify the intended effect of Title II WSARA regulations on the acquisition process concerning cost, schedule, and performance.  Determine the extent to which enacted Title II WSARA has been applied within PEO CS&CSS programs.  Identify gaps between the intent and application of Title II WSARA within PEO CS&CSS, offering recommendations for further research. The analysis shows that correlations exist between WSARA implementation and improved cost and schedule performance.

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Abstract

The purpose of this project is to analyze the effects of Title II Weapon Systems Acquisition Reform Act (WSARA) of 2009 on the Program Executive Office (PEO) Combat Support and Combat Service Support (CS&CSS). Our methodology includes a literature review as well as interviews with program office stakeholders. We review collected data to establish a correlation between WSARA implementation and how stakeholders perceive the application of these regulations through the following:

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The analysis shows that correlations exist between WSARA implementation and improved cost and schedule performance.

Keywords: Weapon Systems Acquisition Reform Act (WSARA), Program Executive Office (PEO)

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About the Authors

Major (MAJ) Banford is a native of Logan, UT. He was commissioned a second lieutenant in the United States Army through ROTC at the University of Utah in May 2004.

Military and Civilian Education: MAJ Banford earned a Bachelor of Arts degree in sociology and a French language minor from the University of Utah. He is also a graduate of the Artillery Officer Basic Course, Fort Sill, OK, and the Artillery Captain's Career Course, Fort Sill, OK.

Assignment Highlights: MAJ Banford has over nine years of military experience operating in combat and garrison environments. After graduating from the Artillery Officer's Basic Course, MAJ Banford's first assignment was as the fire support officer with C Company, 1-27 Infantry Battalion, 2nd Brigade, 25th Infantry Division (Stryker) at Schofield Barracks, HI. MAJ Banford then served as a platoon leader and fire direction officer for B Battery, 2-11 Field Artillery Regiment, 2nd Brigade, 25th Infantry Division (Stryker) where he deployed to the Baghdad and Diyala provinces of Iraq. MAJ Banford returned to 1-27 Infantry during this deployment to serve as the battalion effects coordinator. MAJ Banford went on to serve as logistics officer for 2-17 Field Artillery Regiment, 2nd Brigade, 2nd Infantry Division (Stryker) at Fort Lewis, WA, following the Artillery Captains Career Course. He commanded C Battery 2-17 Field Artillery, taking this unit on deployment to the Khandahar province of Afghanistan where they fulfilled a battle space owner role. He was assessed into the Army Acquisition Corps in September of 2012. Upon redeploying from Afghanistan, he and his family moved from Fort Lewis to Monterey.

Awards and Decorations: MAJ Banford's military awards and decorations include the Meritorious Service Medal, Army Commendation Medal with two OLCs, Army Achievement Medal with one OLC, National Defense Service Medal, Afghanistan Campaign Medal with Bronze Star Device, Iraq Campaign Medal with Bronze Star Device, Global War on Terrorism Service Medal, Army Service Ribbon, Overseas Service Ribbon with number 3 indicator, and the NATO Medal. MAJ Banford is authorized to wear the Combat Action Badge, Parachutist Badge, and Air Assault Badge. He is also a member of the Honorable Order of Saint Barbara and holds certifications in Joint Firepower control and Tactical Information Operations.

MAJ Banford is currently a student of the Naval Postgraduate School where he is pursuing a Master's of Business Administration degree with an emphasis in

acquisition program management. He resides in Monterey, CA, with his wife Sabrena and children Teya, Declan, Tristan, and Shay.

Captain Weidman was commissioned as a second lieutenant in May 2005 through ROTC as a distinguished military graduate from Siena College in Loudonville, NY, where he earned a Bachelor of Science degree in marketing management. He is a graduate of the Armor Officer's Basic Course, Signal Officer Leveler's Course, and Signal Captain's Career Course.

CPT Weidman has over eight years of tactical and strategic leadership experience in combat and garrison. His Armor assignments include tank platoon leader and support platoon leader for 2d Squadron (Sabre), 3d Armored Cavalry Regiment, Fort Hood, TX, and Camp Caldwell Diyala Province, Iraq. His Signal assignments include network operations officer, company commander, and program requirements officer for 1st Signal Brigade, Seoul, South Korea.

CPT Weidman is currently attending the Naval Postgraduate School where he will earn a Master's of Business Administration degree with a concentration in contracting management and acquisition with anticipated graduation in June 2014.

CPT Weidman's awards and decorations include the Bronze Star, Meritorious Service Medal, Army Achievement Medal, National Defense Service Medal, Armed Forces Expeditionary Medal, Iraq Campaign Medal (with two campaign stars), Global War on Terrorism Service Medal, Korea Defense Service Medal, Army Service Ribbon, and Overseas Service Ribbon (with numeral 2 device). He is authorized to wear the Combat Action Badge and the Air Assault Badge. He is also a member of the Order of Saint George and holds Cisco Certified Network Associate, Cisco Certified Network Associate-Voice, and Certified Ethical Hacker certifications.

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List of Acronyms and Abbreviations

APB	acquisition program baseline
APUC	average procurement unit cost
CAE	component acquisition executive
CCIR	commander's critical information requirements
CDD	capability development document
CJCS	chairman of the joint chiefs of staff
CV	coefficient of variation
CY	calendar year
DAE	defense acquisition executive
DAMIR	Defense Acquisition Management Information Retrieval System
DAP	Defense Acquisition Portal
DAS	Defense Acquisition System
DCAPE	director of cost assessment & program evaluation
DoD	Department of Defense
DoDI	Department of Defense Instruction
DOTMLPF-P	doctrine, organization, training, materiel, leadership, personnel, facilities, and policy
DT&E	developmental test and evaluation
EMD	engineering and manufacturing development
FASA	Federal Acquisition Streamlining Act
FRP	full-rate production
FY	fiscal year
GAO	Government Accountability Office
ICD	initial capabilities document
JCIDS	Joint Capabilities Integration and Development System
JLTV	joint light tactical vehicle
JROC	Joint Readiness Oversight Council
KPP	key performance parameter
LCSP	life-cycle sustainment plan

LRIP	low-rate initial production
MAIS	major automated information system
MDA	Milestone Decision Authority
MDAP	major defense acquisition program
MRAP	mine-resistant ambush-protected
MRC	Military Reform Caucus
MSA	Material Solution Analysis
OE	operational environment
OEM	original equipment manufacturer
OS	operations and support
OSD	Office of the Secretary of Defense
PARCA	Performace Assessments and Root Cause Analyses
PAUC	program acquisition unit cost
PdM	product manager
PEO CS&CSS	Program Executive Office for Combat Support and Combat Service Support
PM	program manager
PPBES	Planning, Programming, Budgeting, and Execution System
RDEC	Research, Development, and Engineering Center
SAR	Selected Acquisition Report
SE	systems engineering
SKOT	sets, kits, outfits, and tools
TACOM	Tank and Automotive Command
TD	technology development
TDP	technical data package
WSARA	Weapon Systems Acquisition Reform Act

I. INTRODUCTION

A. ACQUISITION PROCESS AND THE PERCEPTIONS OF REFORM

Defense spending currently accounts for over 13% of U.S. government outlays, at an anticipated dollar amount of $800 billion for fiscal year (FY) 2014. Acquisitions, or procurement (these terms are used interchangeably), spending is approximately 17.5% of defense outlays, or nearly $140 billion annually (projected for FY2014). These numbers give an order of magnitude to the funds committed annually to create capabilities within the U.S. Department of Defense (DoD; Government Spending Breakdown, n.d.).

Concern over the acquisition process appears warranted when considering the amount of taxpayer dollars funding this process. The Weapon Systems Acquisition Reform Act (WSARA) of 2009 is one of many regulatory reforms aimed at improving the complex acquisition process. The following sections present a brief background on the acquisition process (system) and historical efforts at reforming this process leading up to the implementation of the WSARA in 2009.

B. THE ACQUISITION SYSTEM "BIG A"

The acquisition system is composed of the requirements identification process, the budgeting and funding process, and the actual process of managing the purchase or manufacture of the product. In defense terminology, these three areas are as follows:

- **The Joint Capabilities Integration and Development System (JCIDS):** This system is responsible for determining requirements and reducing program redundancy across military service branches.
- **The Planning, Programming, Budgeting, and Execution System (PPBES):** This system is responsible for forecasting funding resources and managing the execution of congressionally allocated and appropriated funds.
- **The defense acquisition system (DAS):** This is the actual process of incorporating user requirements, determining whether to make or buy a product to meet those requirements, and the method spanning from this requirement identification through the entire life cycle of the resulting product. This is also the focal point for acquisition reform efforts (Schwartz, 2013).

When meshed together, these three areas contribute to the entire acquisition process ("Big A"), as depicted in Figure 1.

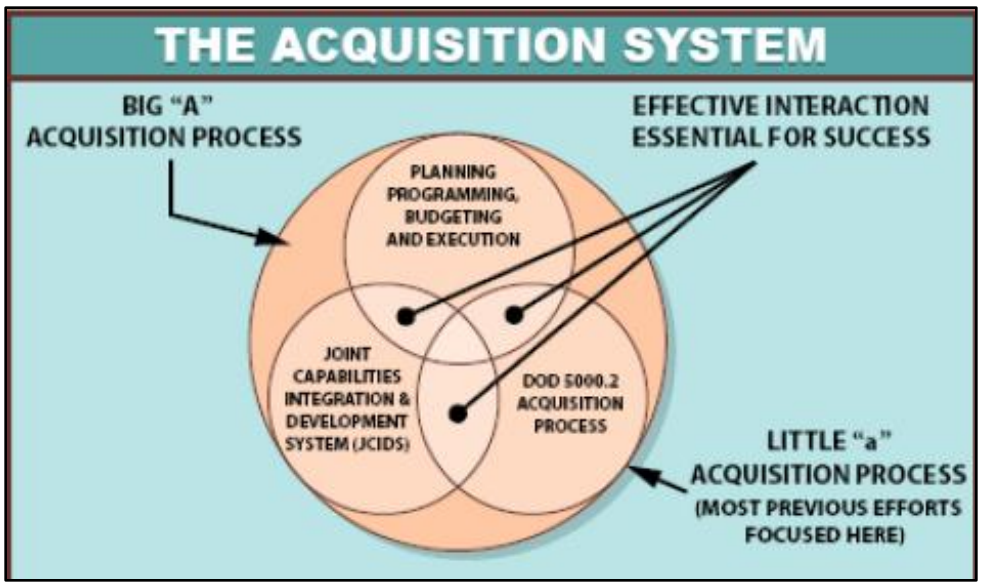

Figure 1. The Acquisition System
(Schwartz, 2013)

C. THE PLANNING, PROGRAMMING, BUDGETING, AND EXECUTION SYSTEM

"A number of issues related to planning and budgeting for national defense confound DOD and congressional decision makers annually. Among these are how to perform effective and competent threat assessment and the consequences of doing this job well or poorly" (Jones & McCaffery, 2008, p. 88). If there were no need to consider fiscal constraints when outfitting U.S. military forces, there would be no need for the PPBES. However, in an environment of constraints, the PPBES is the U.S. government's method of accounting for, planning, programming, and budgeting for products and systems to meet the needs of warfighters and monitor the execution of funds to ensure appropriate fund allocation and expenditures. The PPBES is composed of four steps:

1. **Planning:** During the planning stage, the needs of combatant commands are analyzed and the findings are published in the Joint Programming Guidance document, which guides the DoD components' efforts to propose acquisition programs.
2. **Programming:** During the programming stage, proposed programs are fleshed out, and the program objective memorandum, a document that outlines the anticipated missions and objectives of the proposed weapon system and anticipated budget requirements, is submitted to propose these programs. The memoranda are reviewed and, as deemed appropriate, integrated into an overall defense program.

3. **Budgeting:** Budgeting occurs concurrently with the programming stage. Proposed budgets are reviewed in a different manner than proposed programs. Upon completion of a program decision or as a result of a budget review, program budget decisions are issued.
4. **Execution:** Execution occurs simultaneously with the program and budget reviews. During execution, programs are evaluated and measured against established performance metrics, including the rates of funding obligation and expenditures. (Schwartz, 2013)

Much of acquisition reform results from discrepancies in what occurred during the planning and programming phases when compared to actual budget execution within acquisition programs.

D. THE ACQUISITION PROCESS "LITTLE A"

The U.S. Department of Defense (DoD) is by far the largest and most complex business organization in the world. It operates more than 5,400 installations worldwide and executes more than 15 million contracts per year. It also develops and produces the most sought-after weapons and equipment in the free world (Fox, 2011, p. 1).

The DoD is complex, and the acquisition process is one of the most complex processes existing in the DoD. Figure 2 portrays the acquisition process, its phases, and milestones. Although the figure seems simple, the workings of the process are complex.

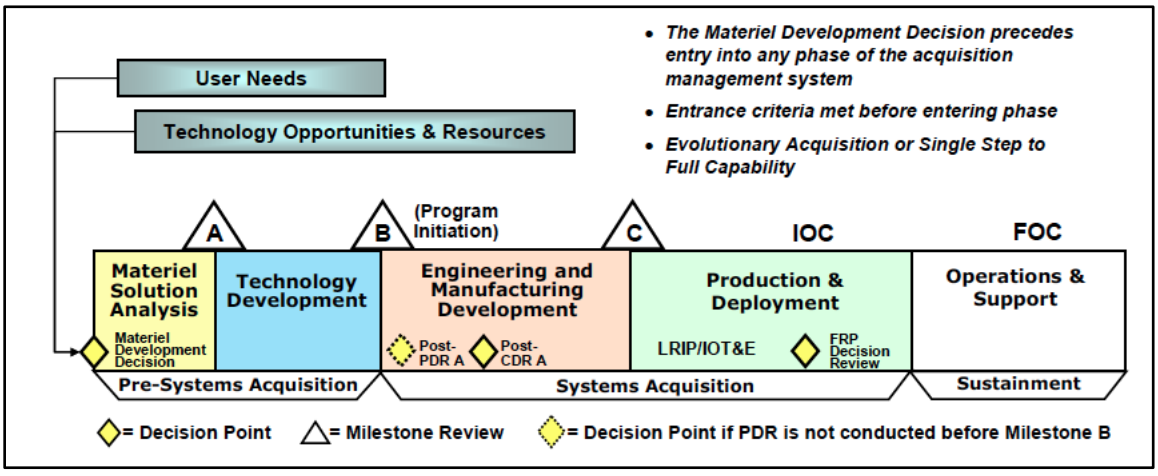

Figure 2. Acquisition Process
(Defense Acquisition University [DAU], n.d.-a)

The Material Development Decision initiates the Material Solution Analysis (MSA) phase of the acquisition process after a user need is identified. The goal of this phase is to determine the method (make or buy) required to meet end-user

needs. This phase includes the Analysis of Alternatives, where acquisition officials consider any capability, including commercial off-the-shelf, which can satisfy the requirement with the greatest benefit regarding cost, schedule, and performance. Emphasis during this phase is on adequately identifying user needs so that there are no requirement misunderstandings in the early stages of program consideration. The program moves to Milestone A with the creation of the Technology Development Strategy, as it postures for progression into the Technology Development (TD) phase. The Milestone Decision Authority (MDA) evaluates the program for advancement into the TD phase (DoD, 2013b).

The goal of the TD phase is to produce technologies mature and capable enough to support program requirements. The acquisition strategy—the framework for the entire program acquisition process—is developed during this phase and includes developing the system's cost, schedule, and performance criteria. Product prototypes are developed to demonstrate initial capabilities required to move into the following acquisition process phase. Requests for proposals are disseminated, and contractors begin to compete for the contract award. The program manager (PM) develops the preliminary design review, which establishes baselines for human, software, and hardware support systems. At Milestone B, the MDA determines whether to allow a program to advance into the Engineering and Manufacturing Development (EMD) phase based on technological capabilities demonstrated and technological risk reduced during the TD phase (DoD, 2013b).

A program advances into the EMD phase if the technology has matured, the MDA has approved the acquisition strategy, and funding is fully approved. The intent of the EMD phase is to demonstrate sound manufacturing, logistical, and end-product capabilities. Collaboration with end users during the prior two acquisition phases proves imperative because in those phases, key performance parameters (KPPs) are identified as the baseline by which the product will be analyzed. Significant testing occurs during this phase, and products must demonstrate their capabilities in a relevant developmental environment. The EMD phase incorporates all manufacturing, industrial, logistical, and human systems into the program, and these systems must demonstrate their capability prior to the next milestone decision. When the program has demonstrated these capabilities and successfully completed developmental test and evaluation (DT&E), the MDA conducts the Milestone C and low-rate initial production (LRIP) analysis, which determines whether the program advances to the Production and Deployment phase (DoD, 2013b).

The DOD 5000.02 states that "the purpose of the Production and Deployment phase is to achieve an operational capability that satisfies mission needs" (DoD, 2013b, p. 27). Operational Test and Evaluation tests the product or system in an operational environment (OE), incorporating end users and support systems

equivalent to the OE. After the system demonstrates capacity to meet operational needs and meets other Milestone C criteria mentioned in DoD Instruction (DoDI) 5000.02 Enclosure 9, the LRIP decision allows initial production to begin. Key to this phase is the rectification of any discrepancies identified during the previous phase, which ensures that issues identified during test and evaluation do not persist in the LRIP. Furthermore, as manufacturing, logistical, and industrial systems prove their capability to produce the initial low rates of production, these systems are further assessed to determine their capacity to move into full-rate production (FRP). FRP leads into the full deployment of the product or system to the intended end user (DoD, 2013b).

The final phase of the acquisition process is the Operations and Support (OS) phase. Prior to entering the OS phase, a program must demonstrate that it has a life-cycle sustainment plan (LCSP), among other items. The LCSP is part of the program from the beginning and develops in conjunction with the maturing program, ensuring that support responsibilities are adequately defined and that trained personnel, equipment, and infrastructure fulfilling support and maintenance roles are present. This phase spans the remaining life cycle of the program, from FRP to the end of the product or system's life. The program office continues to monitor the product or system's performance data, determining whether adjustments must be made to units in production (DoD, 2013b).

E. THE JOINT READINESS OVERSIGHT COUNCIL AND JCIDS

What drives a requirement? Jones and McCaffery (2008) may have stated it best when they said, "Threats to national security, perceived or actual, and political priorities drive the amount of defense funding requested and appropriated for weapons acquisition" (p. 83). The Chairman of the Joint Chiefs of Staff (CJCS) leads the Joint Readiness Oversight Council (JROC) through the JCIDS process and the JROC's integration into the acquisition process. It is imperative that the JROC be involved with the acquisition process from the moment that an end-user requirement is identified. This involvement ensures that programs do not suffer from redundancies if a capability exists in a separate military branch, allowing for more efficient allocation of procurement funds. "JCIDS provides a transparent process that allows the JROC to balance joint equities and make informed decisions on validation and prioritization of capability requirements" (DAU, n.d.-b, p. 1). The JROC and JCIDS fulfill many key roles within the acquisition process, as highlighted in the purple portions of Figure 3.

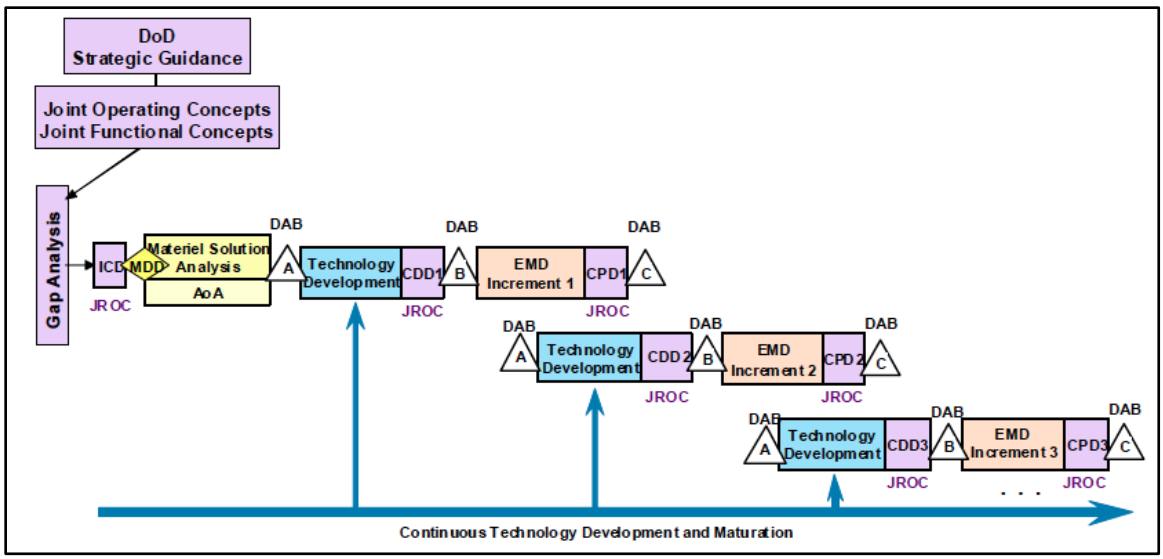

Figure 3. JCIDS Review Process
(DoD, 2013b)

DoD components and services conduct capabilities-based assessments that lead to a determination of whether a capability gap exists. JCIDS plays a key role by increasing collaboration among services. When a capability gap is determined, an initial capabilities document (ICD) is generated if non-material solutions have been exhausted. Non-material solutions are analyzed on the basis of doctrine, organization, training, materiel, leadership, personnel, facilities, and policy (DOTMLPF-P). The JROC assists with determining whether the requirement can be met by changing an aspect of DOTMLPF-P; otherwise, an ICD is developed. The ICD is the first key document that JCIDS contributes to the acquisition system. This document feeds into the MSA and the Concept Exploration phase (CJCS, 2012).

JCIDS and JROC involvement in the acquisition process remains imperative to meeting user needs. JCIDS develops capability development documents, which verify that the developing product, system, and technology are capable of moving into the next phase of the acquisition process. The JROC regularly interfaces with acquisition's representatives and combatant units, verifying KPPs and ensuring that the program is on track with the needs of joint forces and cost, schedule, and performance parameters. JCIDS is also responsible for developing the capabilities production documents, which indicate that the program's producability and logistical and infrastructural support systems are mature and capable enough for the program to exit one phase and enter the next (DoD, 2013b).

This complicated process, composed of multiple organizations and many stakeholders, has seen many reformation initiatives and regulations over the years. Intended benefits of reform varied from a more streamlined process, higher end-user satisfaction, and control of cost and schedule overruns. Prior to understanding why

reform has occurred and whether reform actions have been successful, one must understand the process, its complexities, and the differing incentives driving stakeholders in and around the acquisition process.

F. PERCEPTIONS REGARDING ACQUISITION IMPLEMENTATION

Acquisition reform dates back to as early as 1862 when President Abraham Lincoln requested the resignation of the secretary of war, Simon Cameron, due to contracting "corruption and mismanagment" (Schwartz, 2013, p. 12). Other acquisition reforms continued in the decades that followed, including in 1958, when the Defense Reorganization Act further restructured the acquisition process. Modern acquisition reform initiatives date back to the early 1990s and encompass a list of 63 initiatives (Hanks, Axelband, Lindsay, Malik, & Steele, 2005). More recent efforts led to overhauls of major defense acquisition policy, including the acquisition operations manual DoDI 5000 series. However, despite many efforts to reform the acquisition system, multiple programs continued to fail at meeting cost and schedule requirements (see Figure 4).

	Fiscal Year		
	2003	2007	2008
Portfolio size			
Number of programs	77	95	96
Total planned commitments	$1.2 trillion	$1.6 trillion	$1.6 trillion
Commitments outstanding	$724.2 billion	$875.2 billion	$786.3 billion
Portfolio indicators			
Change to total RDT&E costs from first estimate	37 percent	40 percent	42 percent
Change to total acquisition cost from first estimate	19 percent	26 percent	25 percent
Total acquisition cost growth	$183 billion	$301.3 billion[a]	$296.4 billion
Share of programs with 25 percent increase in program acquisition unit cost growth	41 percent	44 percent	42 percent
Average schedule delay in delivering initial capabilities	18 months	21 months	22 months

Source: GAO analysis of DoD data.

Notes: Data was obtained from DoD's Selected Acquisition Reports (SAR) (dated December 2002, 2006, and 2007). In a few cases, data were obtained directly from program offices. The number of programs reflects the programs with SARs; however, in our analysis we have broken a few SAR programs into smaller elements or programs. Not all programs had comparable cost and schedule data and these programs were excluded from the analysis where appropriate. Portfolio performance data do not include costs of developing Missile Defense Agency elements or the Defense Integrated Military Human Resources System (DIMHRS) program. The total acquisition cost growth for the 2007 portfolio was $295 billion in 2008 constant dollars (GAO-09-663T, p. 0).

Figure 4. Analysis of DoD MDAP Portfolios
(Francis, 2009)

These failures to meet requirements led to another round of acquisition reforms, including the WSARA of 2009 and the Better Buying Power initiatives. These reforms again intended to reduce cost and schedule overruns while improving performance.

G. CONCLUSION

The number of initiatives spanning approximately 23 years of acquisitions—63 initiatives in total—is one of the key points from the RAND study conducted by Hanks et al. (2005). These initiatives are often mere policy documents generated as a new leader assumes position within the purview of the acquisition process and rarely find their way into actual acquisition regulation. Another issue plaguing acquisitions and reform efforts is discussed in a more recent study conducted by the Government Accountability Office (GAO; Francis, 2013). This study concluded that the incentives driving multiple stakeholders involved with the acquisition process differ vastly and continue to frustrate the acquisition system. Our research analyzes

incentives and how current reward and evaluation systems may not be aligned with regulation implementations (such as the WSARA of 2009) and create a disconnect between regulation and activities in an acquisition organization.

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II. LITERATURE REVIEW AND WSARA BACKGROUND

In Chapter I, we established the foundation of this research. In this chapter, we provide a literature review surrounding the WSARA. This review covers the following:

- establishment and implementation of the WSARA;
- WSARA implementation and program and product successes;
- desired effects occurring from the WSARA; and
- cost, schedule, and performance and contract metrics.

To capture the complex timeline of reform initiatives, the paragraphs in this chapter are organized by the project's objectives; resources are described in chronological order.

A. LITERATURE SELECTION

The literature surrounding acquisition reform helps to illuminate and determine the project objectives. To determine whether there is a correlation between WSARA implementation and program and product success, we first examine the need for establishment of the WSARA and the key aspects of acquisition reform. Next, to determine whether WSARA legislation is having the desired effects, we address current legislative debate and articles. Finally, to assess the effects of WSARA legislation on cost, schedule, performance, and contract metrics, we look at the WSARA's intended effects, perceived effects, and actual effects. We also show how effects-based management theory can be tied to WSARA implementation and describe why there is a need for an accurate assessment on the measures of performance related to the WSARA.

We selected the literature because there is not much data on the WSARA or its actual effects. We chose a variety of mediums due to the ambiguity surrounding the topic. To see more deeply into the subject matter, we selected journal articles and books from experts on acquisition reform. We also selected key GAO reports to illustrate ongoing challenges and analysis. We also chose congressional transcripts that cover acquisition reform and some debate on the WSARA. And finally, we selected relevant news articles to reflect public understanding and interpretation of the legislation and acquisition reform issues.

1. Establishing a Need for the WSARA

The WSARA was a necessary piece of legislation. Its intent was "to improve the organization and procedures of the Department of Defense for the acquisition of

major weapon systems, and for other purposes" (Weapon Systems Acquisition Reform Act [WSARA], 2009). Decades of acquisition reform and initiatives led up to the implementation of the law. Hanks et al. (2005) identified 63 acquisition reform initiatives from the 1960s to 2001 that were aimed at streamlining logistics; improving the industrial base; managing total life-cycle system management; and reducing waste, fraud, and abuse.

The Military Reform Caucus (MRC), cofounded in part by Newt Gingrich, was originally founded in 1981 (Malishenko, 1987). Malishenko (1987) highlighted congressional dynamics in his article with the MRC. The article sheds light on early attempts for bipartisanship between political parties of the House and Senate in the 1980s during the early years of the acquisition reform initiatives. The MRC membership was based on interested congressional members and helped lay the foundation for future legislation (Malishenko, 1987).

Thompson (1992) described his frustration with the number of laws and extra layers of bureaucracy added to the DoD acquisition processes and stated that "greatly increased regulation and oversight [are] needed to fix the system" (p. 729). Furthermore, Congress "added an assortment of new laws aimed at further disciplining DOD acquisitions to the existing 1,150 feet of legislation and case law governing procurement" (Thompson, 1992, p. 729). Thompson (1992) highlighted that

> most acquisition experts call for the elimination of the statutes that limit the proper exercise of the acquisition officer's discretion. They all call for a substantial reduction in the size and scope of the systems commands, systems specifications, evaluation teams, and in the number of criteria the evaluation teams consider in the source selection process. Most call for clear command channels, limited reporting requirements, and project teams with small high-quality staffs. (p. 744)

Many reform initiatives were established leading up to the WSARA law. Most notable is President Reagan's Packard Commission report from 1986. The Packard Commission "concluded that the primary problems with the acquisition process were the same ones identified in previous decades (cost growth, schedule delays, performance shortfalls)" (Christensen, Stearle, & Vickery, 1999, p. 251). Through their study, Christensen et al. (1999) highlighted previous attempts of legislation that were not adequate in improving cost performances: "Despite the implementation of more than two dozen regulatory and administration initiatives, there has been no substantial improvement in the cost performance of defense programs for more than 30 years" (p. 252).

A 2005 RAND report (Hanks et al., 2005) highlighted acquisition reform initiatives that illustrate 63 initiatives from 1966 up to 2001 that were marginally

successful. Several of the interview quotations from the RAND report emphasized this theme:

- "Acquisition Reform inhibitors: need to change law or just working the edges; need to change how funding is done. Example: ____ program subsidizes everything at ____ (Major Subordinate Command), so the incentives are to keep selling parts [to that program] and not let them fix the parts" (program executive officer–military; p. 121);
- "The test community is still focused on their reporting requirements rather than testing to fix" (PM–military; p. 110).

In their analysis of organizational transformation, Eide and Allen (2012) explained acquisition reform legislation in clear and concise detail. Starting with the Packard Commission report of 1986, Eide and Allen (2012) specifically stated,

> Excellence in defense management will not and cannot emerge by legislation or directive. Excellence requires the opposite—responsibility and authority placed firmly in the hands of those at the working level, who have knowledge and enthusiasm for the tasks at hand. (p. 102)

The Goldwater–Nichols Act of 1986 followed the Packard Commission report and addressed some of the changes that the Packard Commission suggested, specifically "diluted authority for execution" (Eide & Allen, 2012, p. 102). Moving up a decade into the 1990s, a more business-minded aspect became apparent in legislation and reform initiatives. Focusing on the acquisition workforce, "The Defense Acquisition Workforce Improvement Act (DAWIA) of 1990 addressed the need to improve the quality of the acquisition workforce, establishing formal career paths and standards for education and training" (Eide & Allen, 2012, p. 102).

President Clinton signed two laws focused on acquisition reform during his presidency: the Federal Acquisition Streamlining Act (FASA) of 1994 and the Clinger–Cohen Act of 1996. To broaden the definition of what a commercial item was, "FASA streamlined procurement of commercial items by exempting them from existing laws" (Eide & Allen, 2012, p. 102). The Clinger–Cohen Act of 1996 facilitated the way that the government acquires information technology by "eliminat[ing] cost accounting standards that had discouraged commercial companies from doing business with the federal government" (Eide & Allen, 2012, p. 102).

In 2005, the Defense Acquisition Performance Assessment Project was established to provide an assessment of the DoD's acquisition system. Major findings of the project included identification of "excessive oversight and complex acquisition processes as cost and schedule drivers, and called for stability of

requirements as an essential element for an effective acquisition system" (Eide & Allen, 2012, p. 104).

The WSARA aimed at improving the success of major defense acquisition programs (MDAPs). To accomplish this task, the WSARA provided focus on early decision variables such as "reliable and independent baseline cost estimates, rigorous early developmental testing and systems engineering oversight, and strong gatekeeping to prevent programs from proceeding with too much risk of immature technology" (Eide & Allen, 2012, p. 106). Along with program success, an implied goal of the WSARA was to reduce costs and risk. Increased competition was incorporated in the WSARA to help accomplish this goal (Eide & Allen, 2012, p. 106).

The WSARA's key provisions altered the DoD's acquisition bureaucracy in addition to process systems and senior management oversight changes (Berteau, Hofbauer, & Sanok, 2010, p. 4). The WSARA also legislated important changes on acquisition processes. According to Berteau et al., the WSARA

- increased competition throughout the acquisition process,
- improved requirement formulation processes,
- improved cost-estimation processes,
- enforced a more stringent set of regulations on organizational conflicts of interest,
- revised Milestone A and Milestone B certification processes,
- revised processes for reporting critical cost growth, and
- increased congressional oversight through heightened reporting requirements.

The WSARA created four senior-level Office of the Secretary of Defense positions with military-service-level equivalents for the DoD (Berteau et al., 2010; WSARA of 2009):

- Director of Cost Assessment & Program Evaluation (DCAPE)
- Director, Development Test & Evaluation (DT&E)
- Director, Systems Engineering (SE)
- Director for Performance Assessments and Root Cause Analyses (PARCA)

The primary responsibilities of these offices are illustrated in Figure 5.

Table 2: Key Responsibilities of Offices Established as a Result of the Reform Act

Office	Primary responsibilities
Systems Engineering	• serves as principal advisor to the Secretary of Defense and the Under Secretary of Defense for Acquisition, Technology and Logistics on systems engineering activities in the department • develops systems engineering and development planning guidance for DOD • reviews and approves major defense acquisition program systems engineering plans • monitors major defense acquisition program systems engineering activities • reports to Congress annually on systems engineering organization, capabilities, and activities
Developmental Test and Evaluation	• serves as principal advisor to the Secretary of Defense and the Under Secretary of Defense for Acquisition, Technology and Logistics on developmental test and evaluation activities • develops developmental test and evaluation guidance for DOD • reviews and approves major defense acquisition program developmental test and evaluation plans • monitors and reviews acquisition program developmental test and evaluation activities of major defense acquisition programs • reports to Congress annually on developmental test and evaluation organization, capabilities, and activities
Cost Assessment and Program Evaluation	• serves as principal advisor to the Secretary of Defense and other senior officials on matters related to cost analysis and the planning and programming phases of the planning, programming, budgeting, and execution system • develops independent cost estimates for major defense acquisition programs prior to major milestone decisions and updates independent cost estimates when programs have exceeded critical cost thresholds, known as Nunn McCurdy breaches • reviews existing systems and methods for tracking and assessing operation and support costs on major defense acquisition programs • develops analysis of alternative study guidance for major defense acquisition programs • approves the analysis of alternatives study plan for each major defense acquisition program
Performance Assessments and Root Cause Analyses	• assesses major acquisition program performance through independent analyses and through the Defense Acquisition Executive Summary process • identifies the root causes of cost growth and other problems on programs that experience a critical Nunn McCurdy cost breach

Source: GAO Analysis of Weapon Systems Acquisition Reform Act of 2009.

Figure 5. WSARA Key Office Responsibilities
(Sullivan, 2012, p. 5)

2. WSARA Implementation and Correlation to Program and Product Success

Finding the relationship between a legislation's intended effects and its actual results on the group to be legislated is challenging. Legislation rarely has a direct visual result on the DoD's bottom line but rather creates a waterfall of changes and secondary effects. A correlation between two variables can exist, but causation is a different matter. In our research of the WSARA law and its provisions, we make an assumption that the WSARA is the initiator of bottom-line change, if not the catalyst for changes that occur.

The bottom line in the corporate world is profit. For a governmental entity like the DoD, the acquisition bottom line is measured in cost, schedule, and performance. There is a correlation between other acquisition initiatives and cost, schedule, and performance metrics. Biery (1992), along with some other researchers, argued that the DoD was doing well during the 1990s, positing that "if meeting cost and schedule objectives measures an institution's managerial efficiency, then the DOD is more efficient than the typical commercial business or government organization" (p. 644).

Biery (1992) also illustrated that the end of each decade has a decreasing trend of cost growth and compound annual growth rate.

Countering Biery's (1992) argument, Christensen et al. (1999) conducted a cost overrun analysis on 269 contracts that were four years before and four years after the implementation of the Packard Commission recommendations. The assumption was that there would be a clear drop in cost overruns. However, Christensen et al.'s (1999) results, as seen in Figure 6, "show that the Packard Commission's recommendations did not improve the cost performance of defense acquisition contracts" (p. 256).

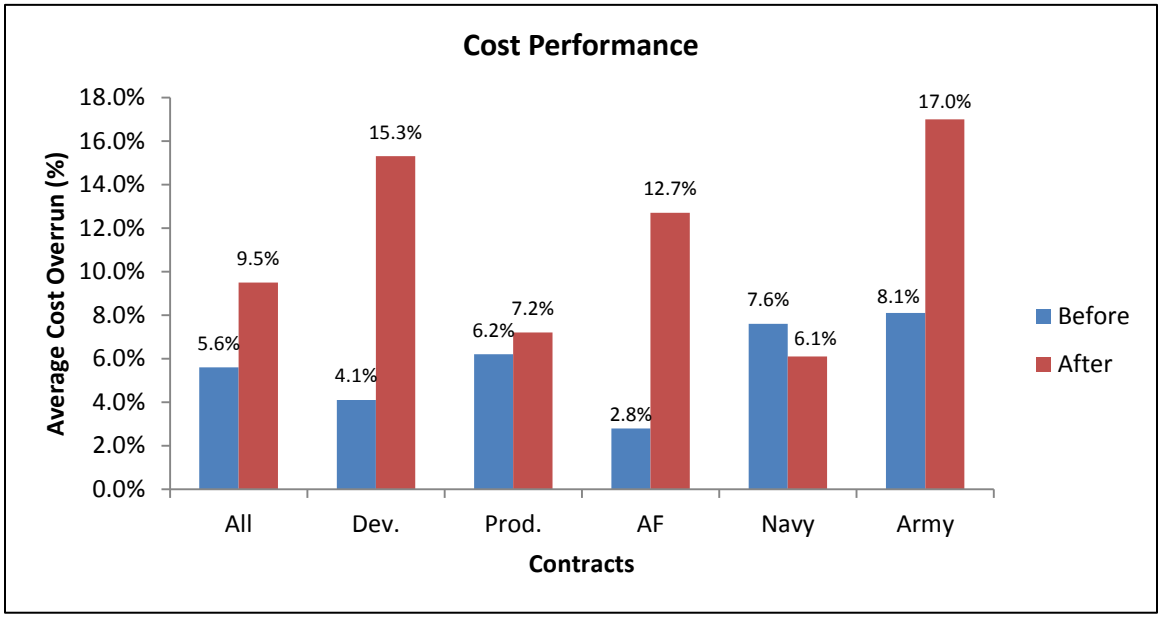

Figure 6. Graph From Cost Overrun Analysis on Packard Commission Reforms
(Christensen et al., 1999)

The WSARA's implementation has had success, as illustrated in the third GAO report on the WSARA, authored by Sullivan (2012). According to the report, the "GAO's analysis of 11 weapon acquisition programs showed the Reform Act has reinforced early attention to requirements, cost and schedule estimates, testing, and reliability" (Sullivan, 2012, p. 1). This is reinforced by GAO Report No. GAO-14-145T, authored by Francis (2013); Francis indicated that "to the extent reforms like the Weapon Systems Acquisition Reform Act and DOD's Better Buying Power initiatives are being implemented, they are having a positive effect on individual programs" (p. 5).

3. Desired Effects From the WSARA

The Department of Defense's Rapid Acquisition Process: Is It a Model for Improving Acquisition?, the first hearing before the Panel on Defense Acquisition Reform of the House Armed Services Committee on June 3, 2009, highlighted ongoing challenges associated with the DAS. During the hearing, Gordon England, a former deputy secretary of defense and president of the company E6 Partners, spoke on the complexity of the DAS:

> Counterintuitively, that means you want to give managers more flexibility. The more complex the system, the more flexibility you need, managers need. The trend is always the other way. That is it gets more complex, we add layers of bureaucracy and regulation and control and that makes it almost impossible to run very complex programs. So the system today is way overburdened. It is over-burdened by the Department, it is overburdened by the Congress. As it becomes a more complex system, we need to simplify it, otherwise managers won't be able to operate. (*The Department of Defense's Rapid Acquisition Process*, 2009, p. 6)

Representative Jim Cooper from Tennessee mentioned additional complexity added to the acquisition process from the WSARA but unfortunately suggested that no one read the law, stating,

> I am worried about the Tower of Babel effect when we create a system that is so complex that nobody can understand it. We were just joking prior to the hearing that how many people actually read the weapons acquisition bill that we just passed. Nobody. (*The Department of Defense's Rapid Acquisition Process*, 2009, p. 17).

Robert Andrews, the chairman of the panel at the time, addressed the lack of coordination between requirements, budgeting, and procurement (*The Department of Defense's Rapid Acquisition Process*, 2009, p. 10). Luckily, the WSARA addressed some of Andrews' concerns.

Programs are just beginning to implement the provisions of the WSARA (Sullivan, 2012). The report points to little to no improvement in acquisition areas. However, according to a 2013 report by the Government Business Council, there has been improvement in personal accountability (as shown in Figure 7).

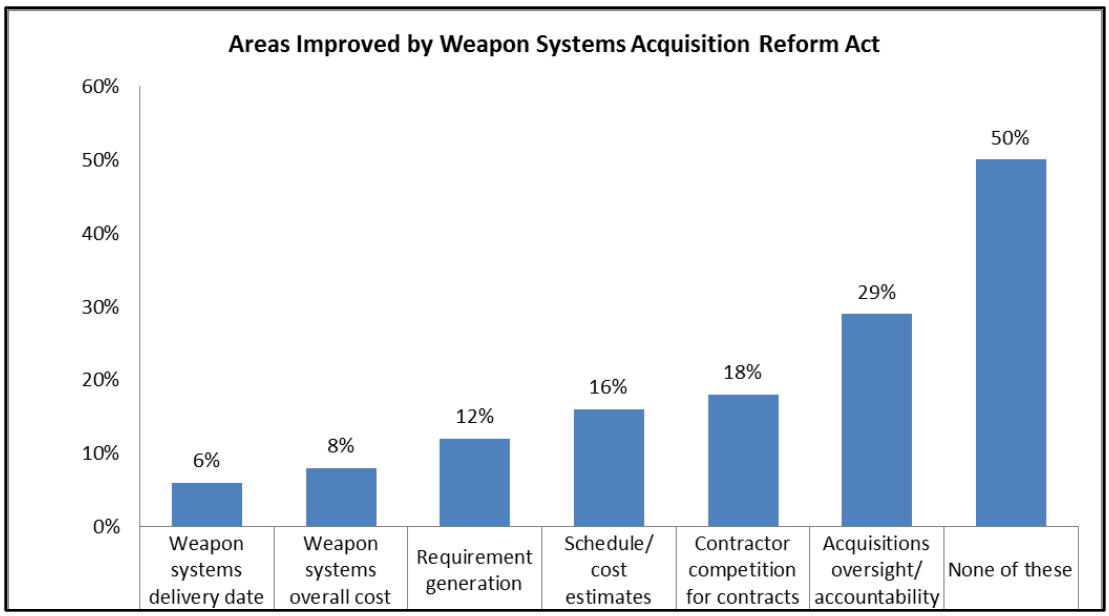

Figure 7. Acquisition Areas of Improvement, Affirmative Answers
(Government Business Council, 2013, p. 21)

4. Conclusion

This chapter introduced past and current literature on the establishment and implementation of the WSARA; correlation between WSARA implementation and program and product successes; intended effects of the WSARA; cost, schedule, and performance and contract metrics; and effects-based management. The next chapter describes research methodology, our data collection process, a description of the Program Executive Office for Combat Support and Combat Service Support (PEO CS&CSS), a list of our survey questions, and the analysis we conducted.

The literature covering this topic has several agreements. First, consistent acquisition reform is needed as requirements are continuously generated from threat-based analysis within budgetary constraints; refinement and reform of the acquisition system is needed. Second, acquisition reform is ongoing. As mentioned, threats and the operating environment are always changing. Therefore, timely and accurate reform is needed in legislation and policies to develop the right solution at the right time. Third, flexibility is needed in a complex system. The ability to provide resources to the right people to execute solutions in a complex system is paramount. Fourth, more accurate metrics are needed on cost, performance, and schedule to provide senior leadership with the right information to make decisions.

The literature covering this topic has a couple of disagreements. First, several of the authors at different points in time (both current and past) have disagreed as to whether acquisition reform, the WSARA included, is doing a good job. Hindsight is 20/20—it is easier to measure reforms 10 years after they have

been implemented and the entire operating environment has changed. Second, there is disagreement on how success is measured. Managers at the program and product levels have a different interpretation of which metrics should be used versus those at Congress or in the private sector.

Our project covers a specific case study. We focus on the PEO CS&CSS and its products. By focusing on a single office and seeing how the WSARA is being implemented there, we can provide a more accurate sample rather than providing a blanket population or randomly selected programs. We can also identify successes and challenges more accurately. The lessons learned at a specific program office could then be utilized at other offices as the personnel see fit. Furthermore, we use an analysis on effects-based management and how it could be implemented into different levels of management to yield measurable results.

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III. METHODOLOGY

A. INTRODUCTION

In this chapter, we address the organizational structure of the PEO CS&CSS and then explain our interview and quantitative data methodologies. We generated interview questions and research efforts utilizing the primary and secondary research questions for this project. The project questions are as follows:

- Overarching project question: How are WSARA Title II policies being applied in major defense acquisition programs (MDAPs)?
- Why was the WSARA needed, or what were the precursors that led to the WSARA?
- What was the intended effect of the WSARA?
- How effective has the implementation of the WSARA been in the PEO CS&CSS?
- Are there gaps between the intent and application of Title II of the WSARA within a major PEO? If so, why?

Our intent with these questions was to determine whether acquisition reforms, such as those included in Title II of the WSARA of 2009, have their desired effect in major acquisition programs.

B. PEO CS&CSS LOCATION AND ORGANIZATIONAL STRUCTURE

The PEO CS&CSS is located within the Tank and Automotive Command (TACOM) headquarters perimeter in Warren, MI, and is one of four PEOs within the TACOM structure. The PEO CS&CSS follows the typical major acquisition organization: The PEO and his or her deputies orchestrate the operations of the PMs (civilian or military members in Grade 06 [colonel] or the civilian equivalent) and product managers (PdMs; civilian or military members in Grade 05 [lieutenant colonel] or the civilian equivalent) and their various assistants and staff. For the PEO CS&CSS, the PM level is broken down into the following categories:

- Force protection: This category includes bridging, combat engineering, force sustainment, petroleum and water, sets, kits, outfits and tools, test measurement and diagnostic equipment, and contingency basing infrastructure.

- The Joint Program Office for the Joint Light Tactical Vehicle (JLTV): This category includes the JLTV, the joint Army-Marine acquisition effort currently in the EMD phase of the acquisition life cycle.
- Mine-resistant, ambush-protected vehicles (MRAP): This category includes MRAP-ATV systems and joint logistics.
- Mobile electric power: This category includes small, medium, large, and battery-powered electrical power sources.
- Transportation systems: This category is composed of personnel and logistics transportation systems, including medium tactical vehicles, armored security vehicles, heavy tactical vehicles, allied tactical vehicles, and Army watercraft systems. (PEO CS&CSS, n.d.)

C. INTERVIEWEE SELECTION

In late October 2013, a list of Army-sponsored research projects was distributed through the Naval Postgraduate School's Graduate School of Business and Public Policy channels. Among the projects on the list was a research project sponsored by the PEO CS&CSS stating a request to research acquisition reform and determine whether reforms are implemented and the intended effects are being achieved. In this project, we focused the question concerning acquisition reform to include the WSARA of 2009, specifically Title II. Title II of the WSARA was determined to be the portion of the legislation that was most readily translatable into interview and research questions supporting the greater request issued by the PEO CS&CSS.

We began correspondence with the PEO CS&CSS–designated point of contact to determine interviewee availability. We requested individuals operating at the PM and PdM levels as the primary interviewees, with the understanding that these personnel are ultimately responsible for managing the cost, schedule, performance, and risk of PEO CS&CSS programs. Cost, schedule, performance, and risk are the focal points of the Title II WSARA reforms.

D. INTERVIEW METHOD

We conducted interviews on-site with the PEO CS&CSS in Warren, MI. We utilized this methodology in order to achieve accurate and spontaneous responses from interviewees. Rather than utilizing an e-mailed survey or questionnaire, which potentially would allow interviewees to manipulate or research a best answer to a question, face-to-face interviews afforded honest and candid responses *in situ*. Additionally, conducting interviews on-site allowed us to develop perceptions concerning the PEO CS&CSS and its priorities that could not be gleaned otherwise.

E. INTERVIEW QUESTION DEVELOPMENT

We developed the interview questions based on Title II of the WSARA, as well as expectancy management concepts. First, we converted each subsection of the Title II WSARA legislation into the form of a question. The answers to the question would serve as a means for qualifying the effects of the WSARA at the PEO level. We then categorized the interview questions based on the legislation in order to nest them for analysis of overarching project questions. Second, we developed questions that focused on the interviewee's interpretation of the effectiveness of the WSARA, the incumbent challenges as well as successes.

F. DEFENSE ACQUISITION MANAGEMENT INFORMATION RETRIEVAL SYSTEM DATA

The Defense Acquisition Management Information Retrieval System (DAMIR) compiles multiple sources from MDAP information systems, as well as major automated information systems. According to its website, DAMIR is "the authoritative source for Selected Acquisition Reports (SAR), SAR Baseline, Acquisition Program Baselines (APB), and Assessments" (DAMIR, 2014).

We gathered data from DAMIR with the intent of conducting a high-level quantitative analysis on the data. We were looking for a correlation between program bottom-line numbers and when the WSARA was implemented. We chose SARs for all Army programs present in the DAMIR system from 2005 to 2012. According to the press release (DoD, 2013a),

> SARs summarize the latest estimates of cost, schedule and performance status. These reports are prepared annually in conjunction with the submission of the President's Budget. …The total program cost estimates provided in the SARs include research and development, procurement, military construction, and acquisition-related operation and maintenance. Total program costs reflect actual costs to date as well as future anticipated costs. All estimates are shown in fully inflated then-year dollars.

The SAR categories that we collected categorized the Army programs by the following:

- current estimate,
- contractor,
- unit cost by percentage change,
- sunk funding,
- cost variance, and
- schedule.

The sample data had 17 programs. There was no Army SAR data available for calendar year (CY) 2008. We then placed the data into a pivot table and gave the data sparklines to identify and illustrate trends. The dependent variable was the report categories' cost or given numerical value. The independent variable was the SAR report calendar date.

G. CONCLUSION

The interviews and cost data were used to gain a qualitative and quantitative perspective on the topic. The interviews provided a focused view of the legislation's impact on a program office. The cost data provided a global view on the legislation's effect on the Army's MDAP portfolio.

IV. DATA AND ANALYSIS

A. INTRODUCTION

This chapter addresses the organizational structure of PEO CS&CSS followed by an analysis of interview questions driven by the primary and subordinate research questions for this project. These questions are as follows:

1. Overarching project question: How are WSARA Title II policies being applied in MDAPs?
2. Why was the WSARA needed, or what were the precursors that led to the WSARA?
3. What was the intended effect of the WSARA?
4. How effective has the implementation of the WSARA been in PEO CS&CSS?
5. Are there gaps between the intent and application of Title II WSARA within a major PEO? If so, why?

The intent is to determine whether acquisition reforms, such as those included in Title II of the WSARA of 2009, have their intended effect in major acquisition programs. On-site interviews were conducted to determine the extent that the WSARA is understood and implemented in PEO CS&CSS. Additional data were collected through analysis of program data obtained from the DAMIR website and other related program documents for amplifying information. The interview questions are grouped under the thesis questions, followed by our analysis of responses. We omit the first question in this chapter but return to it in the conclusions and recommendations chapter.

B. PEO CS&CSS ORGANIZATIONAL STRUCTURE

Major acquisition organizations follow a structure where the program executive officer (PEO) and his or her deputies orchestrate the operations of the program manager (PM, civilian or military member in the grade of 06 [colonel] or civilian equivalent) and product manager (PdM, civilian or military member in grade 05 [lieutenant colonel] or civilian equivalent), with their various assistants and staff following this structure, as depicted in Figure 8.

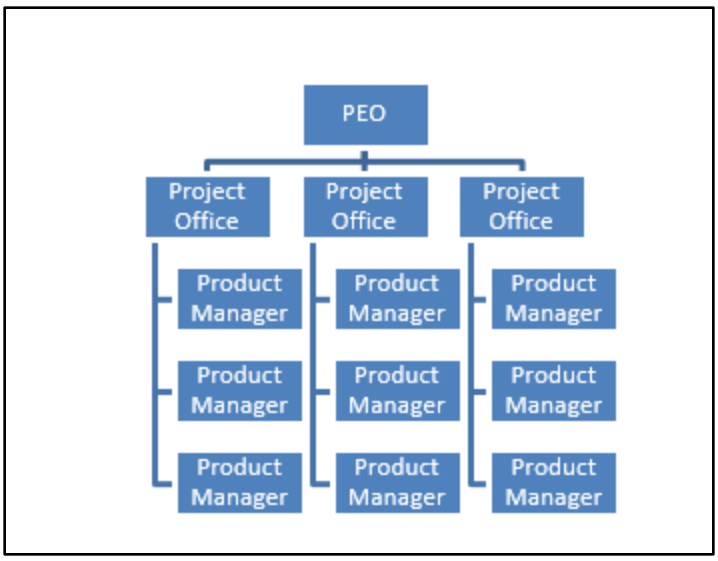


Figure 8. Example PEO Staff Structure

For PEO CS&CSS, the PM level is broken down into the following categories:

- **Force Protection:** This includes bridging, combat engineering, force sustainment, petroleum and water, sets, kits, outfits and tools (SKOT), test measurement and diagnostic equipment, and contingency basing infrastructure.
- **Joint Program Office for the Joint Light Tactical Vehicle (JLTV):** The JLTV is the joint Army-Marine acquisition effort currently in the Engineering and Manufacturing Development (EMD) phase of the acquisition life cycle.
- **Mine-Resistant Ambush Protected Vehicles (MRAP):** This includes MRAP-ATV (MATV) systems and joint logistics.
- **Mobile Electric Power:** This category includes small, medium, large, and battery-powered electrical power sources.
- **Transportation Systems:** This category is comprised of personnel and logistics transportation systems including medium tactical vehicles, armored security vehicles, heavy tactical vehicles, allied tactical vehicles and Army watercraft systems.

PEO CS&CSS manages over 350 systems in total. Our initial interviews were conducted with various representatives within this organizational structure.

1. Task Allocation

WSARA legislation called for additional high-level oversight at the Office of the Secretary of Defense (OSD). The interviews indicated that the PEO staff

structure was in place to match what the WSARA required at OSD level, as shown in Figure 5 of our literature review section. Project and product offices had teams or individuals that would handle data calls required by PEO staff or OSD level. Additionally, while the organization was structured in accordance with regulation, PdMs were capable of adapting their structure based on their program's current phase within the Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management System.

Work tasks are allocated in a hierarchical fashion from PEO to project office to product office. At the product office level, tasks are allocated by PdM-identified priorities.

C. WSARA QUANTITATIVE IMPACTS

The intended effect of the WSARA was "to improve the organization and procedures of the Department of Defense for the acquisition of major weapon systems, and for other purposes" (WSARA of 2009, 2009), with the secondary intent to reduce risk and costs. To accomplish this, the legislation focused on changing senior management oversight and improving early decision variables in the acquisition system.

As established in the literature review, the need for the law was clear. Cost overruns were ever increasing in frequency and value. There was a recognized need "to improve the way weapon systems are acquired" (Sullivan, 2012, p. 4). The intent of the law was to limit those overruns and enhance oversight and accountability by adding additional layers of oversight and streamlining the monitoring process to "ensure that costs are controlled" (Sullivan, 2012, p. 8).

1. Defense Acquisition Management Information Retrieval

DAMIR compiles multiple sources from MDAP and major automated information system (MAIS) information systems. According to its website, DAMIR is "the authoritative source for Selected Acquisition Reports (SAR), SAR Baseline, Acquisition Program Baselines (APB), and Assessments" (DAMIR, 2013). We pulled relevant data from DAMIR. The data retrieved were from the Army's 2005–2012 SARs for noted MDAPs. These sources of data are relevant as stated by the DoD (2013a):

> SARs summarize the latest estimates of cost, schedule and performance status. These reports are prepared annually in conjunction with the submission of the President's Budget. Subsequent quarterly exception reports are required only for those programs experiencing unit cost increases of at least 15 percent or schedule delays of at least six months.

> The total program cost estimates provided in the SARs include research and development, procurement, military construction, and acquisition-related operation and maintenance. Total program costs reflect actual costs to date as well as future anticipated costs. All estimates are shown in fully inflated then-year dollars.

The reports were chosen because they reflect the most relevant data on the Army's MDAPs from 2005 to 2012. Those years were selected to analyze changes occurring in the period four years before the WSARA and three years after. The intent of analyzing the years before and after the WSARA was implemented to see any changes within the sample on cost (which was the WSARA's secondary objective and also the best quantitative measurement for success). There were no Army SARs listed in DAMIR for CY2008.

2. Trends in Cost Data

We specifically analyzed three quantitative cost measures to see whether there were any trends: current estimate total cost; program acquisition unit cost (PAUC) percent change compared to the baseline estimate; and average procurement unit cost (APUC) percent change compared to the baseline estimate. We were looking to see whether costs were increasing, decreasing, or varied before and after implementation of the WSARA. In addition, we wanted to see whether there was variation of cost changes before and after implementation of the WSARA. Figures 9 through 11 from our quantitative analysis show the trends in available data for the programs based off the current estimate, PAUC, and APUC for each program:

		SAR Current Estimate Total Cost in Millions						
TRENDLINE	PROGRAM	2005	2006	2007	2009	2010	2011	2012
	AH-64E New Build					2352.7	2155.8	2484.5
	AH-64E Remanufacture		8990.4	8996.4	11686	11893	11968	13760
	AMF JTRS				9067.1	9005.7	4229.5	3759.9
	CH-47F	12798	13449	13350	13636	14439	14257	14387
	Excalibur	2292.7	2302.8	2465.1	2469.6	1710.6	1676.7	1697.8
	GMLRS/GMLRS AW	16035	6772.5	6008.3	6058.9	6024.4	6411.5	6693.9
	IAMD				5791.6	6320.4	6694.4	6375.2
	JLENS	7340.9	7367.3	7500.3	8063.8	8537.9	2620.5	2645.8
	JTN	1786.6	2104.1	1961.8	1939	1988.4	1992.6	2084.3
	JTRS HMS	11599	11789	3366.9	5240.4	5811.4	9304.7	10191
	MQ-1C Gray Eagle				5220.8	5262.5	4745.3	4888.9
	PAC-3	8527.7	8521.7	8524.9	9326.1	10002	10797	11007
	Patriot/MEADS CAP	30531	30178	29895	30827	12563	12952	12832
	PIM						7899.3	7904.2
	UH-60M Black Hawk	23770	23830	24043	23682	27341	28861	25694
	WIN-T Inc 2			3870.8	4997.7	6352.5	6461.3	5137.4
	WIN-T Inc 3				15964	16056	14456	17890
	Grand Total	114680	115304	109983	153970	145660	147482	149433

Figure 9. SAR Current Estimate, Total Cost in Millions ($)

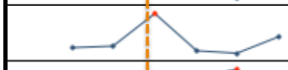
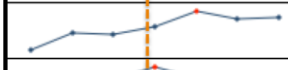
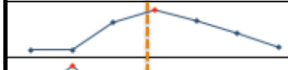
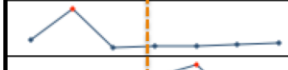
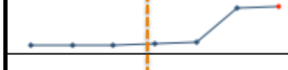
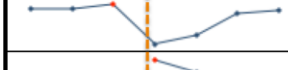
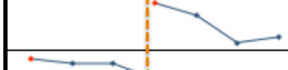
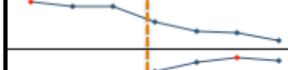
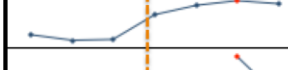
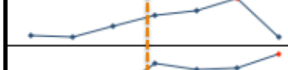
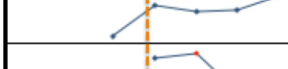
TRENDLINE	PROGRAM	SAR PAUC % Change Against Original Estimate Baseline						
		2005	2006	2007	2009	2010	2011	2012
	AH-64E New Build					-0.74%	-13.78%	-8.11%
	AH-64E Remanufacture		2.33%	2.92%	28.41%	-0.15%	-2.09%	10.53%
	AMF JTRS				2.45%	1.05%	6.99%	-27.62%
	CH-47F	3.18%	8.59%	8.28%	10.73%	15.17%	13.10%	13.48%
	Excalibur	-4.62%	-4.62%	1.39%	4.17%	1.81%	-0.90%	-4.07%
	GMLRS/GMLRS AW	17.14%	68.57%	2.86%	6.67%	5.71%	9.52%	12.38%
	IAMD				0.00%	11.09%	-26.33%	-26.58%
	JLENS	2.20%	1.36%	4.08%	12.35%	17.88%	215.72%	217.46%
	JTN	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	JTRS HMS	3.85%	3.85%	7.69%	-26.92%	-19.23%	0.00%	3.33%
	MQ-1C Gray Eagle				0.00%	-4.38%	-14.53%	-12.74%
	PAC-3	25.03%	23.47%	23.64%	16.99%	13.31%	12.67%	9.37%
	Patriot/MEADS CAP	-5.37%	-7.76%	-7.47%	3.97%	8.94%	10.44%	9.11%
	PIM						0.00%	-1.47%
	UH-60M Black Hawk	9.61%	9.08%	12.69%	16.30%	18.07%	22.20%	8.69%
	WIN-T Inc 2			0.00%	10.68%	8.32%	8.63%	13.40%
	WIN-T Inc 3				-8.77%	-8.00%	-14.10%	-11.26%

Figure 10. SAR PAUC % Change Against Original Baseline

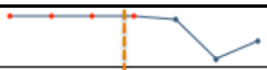
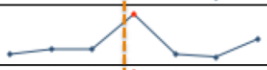
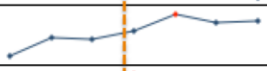
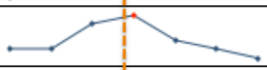
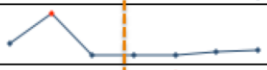
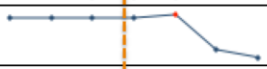
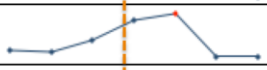
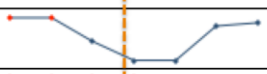
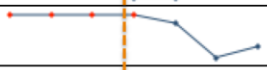
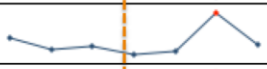
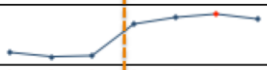
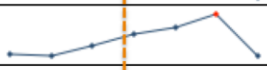
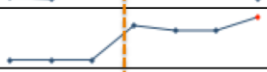
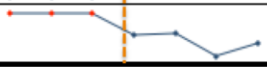
		SAR APUC % Change Against Original Estimate Baseline						
TRENDLINE	PROGRAM	2005	2006	2007	2009	2010	2011	2012
	AH-64E New Build	0.00%	0.00%	0.00%	0.00%	-0.74%	-13.78%	-8.11%
	AH-64E Remanufacture	0.00%	4.07%	4.65%	36.49%	-0.01%	-2.46%	13.74%
	AMF JTRS	0.00%	0.00%	0.00%	1.36%	0.00%	-23.18%	-53.64%
	CH-47F	3.20%	8.70%	8.38%	10.91%	15.45%	13.34%	13.72%
	Excalibur	0.00%	0.00%	15.38%	20.51%	5.26%	0.00%	-5.26%
	GMLRS/GMLRS AW	19.70%	59.09%	3.30%	4.40%	4.40%	7.69%	10.99%
	IAMD	0.00%	0.00%	0.00%	0.00%	2.20%	-30.80%	-37.76%
	JLENS	2.15%	1.22%	5.17%	11.53%	13.31%	0.00%	0.00%
	JTN	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	JTRS HMS	0.00%	0.00%	-20.00%	-36.00%	-36.00%	-7.14%	-3.57%
	MQ-1C Gray Eagle	0.00%	0.00%	0.00%	0.00%	-1.62%	-8.22%	-6.18%
	PAC-3	25.35%	24.20%	24.52%	23.74%	24.11%	27.49%	24.74%
	Patriot/MEADS CAP	-5.29%	-6.66%	-6.46%	3.84%	6.23%	7.03%	5.68%
	PIM	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-1.67%
	UH-60M Black Hawk	9.70%	9.21%	12.88%	16.48%	19.02%	23.31%	9.22%
	WIN-T Inc 2	0.00%	0.00%	0.00%	11.13%	9.39%	9.50%	13.68%
	WIN-T Inc 3	0.00%	0.00%	0.00%	-7.97%	-7.45%	-15.92%	-10.82%

Figure 11. SAR APUC % Change Against Original Baseline

D. CENTRAL TENDENCY

To understand variation in cost measure, we analyzed three measures of variability in central tendency. The intent was to find the measurement that provides the best representation of the data. We used the SARs to gather data on the standard deviations, averages, and coefficient of variation (CV) for the specified cost element current estimate, PAUC, and APUC % changes). First, averages (means) were used to gauge the total average of each program. Second, standard deviation was used to view the average deviation of values from the mean. Third, CV was used to see the dispersion of data relative to the mean because it allows for analysis of variation between the programs that have significant cost differences.

The data provided by DAMIR had 17 Army MDAP programs listed from 2005 to 2012. Data taken as "before WSARA" was from 2005 to 2009 SARs. Data taken

as “after WSARA” was from 2010 to 2012 SARs. For averages, standard deviation, and coefficient of variation, the data were taken from each program’s SAR before and after the WSARA, respectively.

Table 1 summarizes the data collected and calculated; the details are discussed in the following three paragraphs. Dollar values are in millions. The percent changes for PAUC and APUC are the change compared to the original baseline estimate from the SAR.

Table 1. SAR Measures of Central Tendency

AVERAGES			
	Current Estimate	*PAUC % Change*	*APUC % Change*
Programs that increased	11	5	5
Average increase before WSARA	$10,210.16	5.16%	8.69%
Average increase after WSARA	$10,370.26	40.04%	14.79%
Average increase net	**$160.09**	**34.88%**	**6.10%**
Programs that decreased	6	12	12
Average decrease before WSARA	$10,552.49	4.72%	3.13%
Average decrease after WSARA	$6,014.36	-2.73%	-6.02%
Average decrease net	**$(4,538.13)**	**-7.45%**	**-9.15%**
All Programs average before WSARA	$10,347.09	4.87%	4.98%
All Programs average after WSARA	$8,832.88	9.85%	0.10%
All Programs average net change	**$(1,514.21)**	**4.98%**	**-4.06%**
STANDARD DEVIATIONS			
	Current Estimate	*PAUC % Change*	*APUC % Change*
Programs that Increased	9	8	10
stdev increase before WSARA	$297	0.0418	0.0308
stdev increase after WSARA	$1,198	0.2221	0.0979
stdev increase net	**$901**	**0.1803**	**0.0671**
Programs that decreased	8	9	7
stdev decrease before WSARA	$1,572	0.0953	0.0963
stdev decrease after WSARA	$601	0.0357	0.0308
stdev decrease net	**$(971)**	**(0.0596)**	**(0.0655)**
All Programs stdev before WSARA	$1,224	0.0856	0.0578
All Programs stdev after WSARA	$917	0.1234	0.0702
All Programs stdev net change	**$(307)**	**0.0379**	**0.0125**

COEFFICIENT OF VARIATION			
	Current Estimate	*PAUC % Change*	*APUC % Change*
Programs that increased	10	7	10
CV increase before WSARA	2.76%	58.92%	68.29%
CV increase after WSARA	16.40%	117.74%	101.69%
CV increase net	**13.64%**	**58.82%**	**33.40%**
Programs that decreased	7	7	5
CV decrease before WSARA	22.50%	226.34%	124.99%
CV decrease after WSARA	8.25%	95.22%	39.65%
CV decrease net	**-14.24%**	**-131.12%**	**-85.34%**
All Programs CV before WSARA	15.32%	176.11%	99.79%
All Programs CV after WSARA	13.04%	106.48%	81.01%
All Programs CV net change	**-2.27%**	**-69.63%**	**-18.78%**

1. SAR Current Estimate

The first cost estimate was the SAR "current estimate," which is the most recent estimate of the program's parameters reflecting the President's Budget proposal, as well as unforeseen circumstances or unavoidable circumstances that adjusted cost measures (Hagan, 2012, p. B-55).

Before WSARA implementation, 11 programs increased in dollar value from the current estimate. The average value of the 11 programs before the WSARA was $10.21 billion. The average cost estimate of the 11 programs after the WSARA was $10.37 billion, yielding a net increase of $160 million. After WSARA implementation, six programs decreased in dollar value from the current estimate. The average value of the six programs before the WSARA was $10.55 billion. The average value of the six programs after the WSARA was $6.01 billion, yielding a decrease of $4.54 billion. The average of all 17 programs before the WSARA was $10.35 billion. After the WSARA, the average was $8.83 billion, yielding a net decrease of $1.51 billion.

The 11 programs that increased only increased a very small amount. The six programs decreased nearly three times over the average decrease of the entire Army portfolio. However, this could only be an indicator or program cancellations, or appropriations funding being cut. Therefore, the dollar value is not a good indicator because of funding types and varying prices of programs within the portfolio.

From before and after WSARA implementation, the standard deviation of nine programs increased from $297.38 million to $1,198.02 million. Eight programs' standard deviations decreased from $1,572 million to $601 million. The combined

standard deviation difference between programs before and after WSARA implementation indicated a $307 million net decrease.

The standard deviation is a slightly better metric for interpreting current estimate changes. The programs that increased did so four times in magnitude, indicating that programs that did increase in standard deviation are becoming more spread out from the average. The programs that decreased did so by 2.6 times in magnitude, showing a slightly less dispersion around the mean. When comparing all programs, they indicate less dispersion but only a slight decrease.

From before and after WSARA implementation, the CV of 10 programs increased from 2.76% to 16.40%. Seven programs' CVs decreased from 22.5% to 8.25% after the WSARA was implemented, a decrease of 14.25%. The average of all programs' CV went from 15.32% before to 13.04% after the WSARA, yielding a decrease of 2.27%.

As stated before, CV shows the dispersion of data relative to the mean because it allows for analysis of variation while eliminating the significant cost differences and providing the answer in percent form. The current estimate overall decrease is not very significant. The program implication is that current estimates have become more in control by 2.27%.

2. PAUC Percent Change

PAUC is the program acquisition unit cost. It is computed by "dividing the Program Acquisition Cost by the Program Acquisition Quantity" (Hagan, 2012, p. B-177). It is basically how much everything costs divided by the amount of units that are (going to be) purchased. We compared the PAUC percent change from the original baseline estimate per each program SAR.

From before and after WSARA implementation, five programs' PAUC increased from 5.16% to 40.04%, a net increase of 34.88%. 12 programs' PAUC percentage decreased from 4.72% to -2.73%, a net decrease of -7.45%. The combined average for all 17 programs' PAUC percentage change against the baseline estimate increased from 4.87% before the WSARA to 9.85% after, a net increase of 4.98%.

From before and after WSARA implementation, the standard deviation of eight programs increased from 0.0418 before to 0.2221 after, a net increase of 0.1803. Nine programs decreased from 0.0953 before to 0.0357, a net decrease of 0.0596. The combined standard deviation average increased from 0.0856 to 0.1234, a net increase of 0.0379.

From before and after WSARA implementation, the CV of seven programs increased from 58.92% to 117.74%, an increase of 58.82%. Seven programs

decreased from 226.34% to 95.22%, a decrease of 131.12%. Two programs did not have data to allow CV calculation before the WSARA. The combined average for 14 programs with available data to calculate CV yielded a 176.11% before to 106.48% after, a net decrease of 69.63.

The programs PAUC that did only increase did so by 34.88%. Compared to the standard deviation (.1803) of increasing programs, it is a clear indicator of programs becoming more expensive. However, although this is highlighted with the CV of 58.82%, the programs that decreased did so significantly by 131.12%.

3. APUC Percent Change

APUC is average procurement unit cost. It is "calculated by dividing total procurement cost by the number of articles to be procured" (that is, recurring and nonrecurring costs associated with production of the item (Hagan, 2012, p. B-19). It is basically the costs associated with physically making the product or item. We compared the APUC percent change from the original baseline estimate per each program SAR.

From before and after WSARA implementation, five programs increased from 8.69% to 14.79%, an increase of 6.1%. 12 programs decreased from 3.13% to -6.02%, a decrease of 9.15%. The combined average change in APUC decreased from 4.98% before to 0.10% after, a net decrease of 4.06%.

From before and after WSARA implementation, 10 programs' standard deviations increased from 0.0308 to 0.0979, an increase of 0.0671. Seven programs decreased from 0.0963 to 0.0308, a decrease of 0.0655. The combined APUC standard deviation increased from 0.0578 to 0.0702, a net increase of 0.0125.

From before and after WSARA implementation, the CV of 10 programs increased from 68.29% to 101.69%, an increase of 33.40%. Five programs decreased from 124.99% to 39.65%, a decrease of 85.34%. The combined average CV decreased from 99.79% to 81.01%, a net decrease of 18.78%. Two programs did not have data to allow CV calculation before the WSARA.

Average procurement unit costs are decreasing on average. The standard deviation increase shows that they are becoming more difficult to control; however, the CV indicates that the APUC for the Army portfolio is decreasing.

E. INTENDED EFFECTS OF THE WSARA

This section is based off the interviews we conducted. Each subsection of the WSARA's Title II focused on changes to current or new acquisition policy. These questions were part of the interview process conducted at PEO CS&CSS to determine whether and how these legislative requirements are implemented within

this organization. Interview questions were primarily based on sections of WSARA Title II.

1. Consideration of Trade-Offs for Requirement Development

Section 201 of the WSARA states that "the Secretary of Defense shall ensure that mechanisms are developed and implemented to require consideration of trade-offs among cost, schedule, and performance objectives as part of the process for developing requirements for Department of Defense acquisition programs" with the duty of the MDA to ensure that "the program is affordable" (Weapon System Acquisition Reform Act of 2009, 2009).

Program requirements are generated at the Army G3/G4 level and disseminated to PEOs and PMs. PMs have little say on MDAPs to control trade-offs among cost, schedule, and performance objectives. However, the project managers did have influence on the MDA decision-making process on trade-offs as indicated by WSARA 201(f), Duties of Milestone Decision Authority:

> Section 2366b(a)(1)(B) of such title is amended by inserting "appropriate trade-offs among cost, schedule, and performance objectives have been made to ensure that" before "the program is affordable."

Trade-offs had typically been made by the time the current project manager was selected and was actively managing a project. Objectives are typically already set in the program baseline CPD. If there are changes, project managers must provide rationale for the need to change their baseline estimates in cost, schedule, or performance.

Certain programs had less stringent trade-off requirements. For example, the MRAP program could change baseline estimates to meet dynamic requirements driven by the Global War on Terror situations in Iraq and Afghanistan. As one PM put it, "Cost was third, schedule was second, and actually you balance it based on theater priorities." The Joint Light Tactical Vehicle (JLTV) was a cost informed trade driven platform. Tradeoff requirements were pushed to the contractor level based off of tiered capability development documents (CDDs) and KPPs.

The spirit of the legislation matches what the PMs were doing with their respective projects, depending on state of the acquisition cycle. WSARA Section 201(a)(2)(A–B) states that

> (A) Department of Defense officials responsible for acquisition, budget, and cost estimating functions are provided an appropriate opportunity to develop estimates and raise cost and schedule matters before performance objectives are established for capabilities for which the Chairman of the Joint Requirements Oversight Council is the validation

authority; and (B) the process for developing requirements is structured to enable incremental, evolutionary, or spiral acquisition approaches, including the deferral of technologies that are not yet mature and capabilities that are likely to significantly increase costs or delay production until later increments or spirals.

There was clear evidence that the JLTV program did exactly what WSARA 201(c) required of review of joint military requirements. However, the older programs that are were already established did not meet this requirement.

2. Competition Policy

The WSARA mandates competition in as many phases of acquisition as possible. WSARA (2009) Section 202 makes suggestions for competition during

1. competitive prototyping;
2. dual-sourcing;
3. unbundling of contracts;
4. funding of next-generation prototype systems or subsystems;
5. use of modular, open architectures to enable competition for upgrades;
6. use of build-to-print approaches to enable production through multiple sources;
7. acquisition of complete technical data packages;
8. periodic competitions for subsystem upgrades;
9. licensing of additional suppliers; and
10. periodic system or program reviews to address long-term competitive effects of program decisions.

PEO CS&CSS competition policies were assessed to determine the strategies employed to ensure competition of products given the stage of the product in the acquisition life cycle. Reverse engineering techniques are the primary methods employed to create their own technical data package (TDP), which would drive more competition, because the contractors put a high cost on the procurement of TDPs. In addition, the PMs primarily used sole-sourcing due to priorities and the "finite amount of OEMs [original equipment manufacturers]" in the given industry or program.

In contrast, the MRAP and JLTV program focused on values trade-offs with performance-based competitions that helped industry partners be successful, as well as maintaining competition requirements. The need to develop the program requirements and have competition before Milestone A with defense acquisition

executive (DAE) and component acquisition executive (CAE) support would facilitate enforcement.

3. Prototyping

WSARA Section 203 requires prototyping for MDAPs before Milestone B approval. PEO CS&CSS policy concerning prototyping, its frequency of use, potential costs, and the number of times prototyping is waived was analyzed to determine the level of compliance with this WSARA requirement.

> WSARA 203: (a) COMPETITIVE PROTOTYPING.—Not later than 90 days after the date of the enactment of this Act, the Secretary of Defense shall modify the guidance of the Department of Defense relating to the operation of the acquisition system with respect to competitive prototyping for major defense acquisition programs.

Prototyping is required unless the requirement is waived by the MDA, prototypes exceed the expected life-cycle benefits, or the DoD is unable to meet critical national security objectives.

We assessed that prototyping does not typically happen in production phases. Because most of the programs at PEO CS&CSS were in the later phases, the need to prototype was not as prevalent. However, there were some cost savings incentives to prototype if modifications to systems were being made. In that case, the PMs typically used the Research, Development and Engineering Center (RDEC) to develop a prototype or a TDP and then had contractors develop their solutions for the solicitation, thus improving competition.

In contrast, rapid initiatives (like MRAP) did not have prototypes as per the WSARA requirement. The urgent needs of the Army drove the requirement, and they had companies produce units based on performance specs to get equipment out to the troops faster and leverage the waiver elements of the legislation.

4. Systemic Problems and Product Termination

For this section, our research efforts focused on the policies and procedures employed by PEO CS&CSS concerning identification of systemic problems and methods of determining when a product line must be terminated to determine whether deviations from WSARA policy intent and application exist.

The systemic problems were typically identified through internal reporting procedures at project level and presented to the MDA. If problems are identified, WSARA Title II sec 204 requires the MDA to certify costs, needs, program duplicates, relevancy, and that depot-level maintenance and repair capabilities have been made, and conduct an analysis of alternatives consistent with DCAPE guidance.

WSARA Section 206 addresses product termination. The PMs reported changes to cost, performance, or schedule. If the changes were detrimental, the WSARA requires the PM to determine the root cause of cost growth or schedule threshold breach. The reports for these changes followed the same reporting processes as the systemic problems. However, it is the MDA that ultimately determines whether a product or project is continued or terminated.

The reporting structure in PEO CS&CSS allowed for multiple reports on cost performance and schedule from product managers up to the project managers to the PEO. This facilitated the requirement from WSARA 204 with each product/project manager able to customize their reports to explain an issue at hand. Recommendations made at the PM level with supporting cost, schedule, and performance data facilitated decision-making capabilities for the MDA on issues and termination if needed.

5. Effectiveness of WSARA Policies

WSARA policy relevance and cost effectiveness for PEO CS&CSS was addressed to determine whether there is added value from this policy within the PEO. Cost effectiveness is a measure of the results added by a system or, in this case, legislative requirements (Hagan, 2012, p. B-49). We determined that the WSARA legislation requiring the policies that PEO CS&CSS followed were generally cost effective. However, there was some distaste for the reporting requirements; although deemed necessary, the reports may not provide significant value.

F. WSARA IMPLEMENTATION

For this section, we focused our inquiries on reporting requirements and personnel evaluation criteria within PEO CS&CSS. Studying these items enhanced our abilities to determine what is important to the PEO and whether WSARA policies are among the list of important items. We gauged their significance by level and frequency of reporting and whether WSARA policy items are included in personnel evaluation criteria. WSARA assists with comparing and evaluating the importance of these reporting policies within the PEO and whether they appear to be effective and efficient.

1. Cost, Schedule, and Performance Reports

The GAO study mentioned in the beginning of this project stated that incentives are partially to blame for inadequacies in acquisitions (Francis, 2009). We wanted to determine how incentives influenced the reporting process. We learned that acquisition managers and leaders are incentivized to maximize fund obligation rates more than anything else. Although there is a push to meet the

needs of soldiers and that is typically where acquisitions begin, somewhere along the line, it becomes about obligating funds.

In terms of what is reported, the research indicated a wide range of differences. Reform efforts (like the WSARA) stimulate additional reporting. Our research indicated that there are more reports required than can be numbered. The acquisition process becomes muddied when reform efforts create deviations from standard reporting requirements. Reporting has become such an arduous process at the PEO that personnel must be allocated solely to tracking reports and ensuring that reports are submitted on time. Much of this reporting appears to be required from those initiating the reform efforts so that these individuals have evidence that their reforms are creating change.

Programs at PEO CS&CSS in earlier phases of the acquisition life cycle have fewer reporting requirements than those in the latter phases. Some of the common reports include a weekly report sent to everyone in his or her product line, weekly staff calls, metrics and portfolio reviews, and Commander's Critical Information Requirements (CCIR) reporting.

We determined that PEO CS&CSS management trusts that all of its reports go to a higher organization beyond its PEO, albeit a defense acquisition executive (DAE) if one exists, Army Budget Office, or Congress. In terms of which reports are more important than others, there appears to be a focus on obligation of funds and that these reports are prioritized with regard to what is submitted to higher tiers.

There are not strict reporting structures. We determined that program cost reporting is stressed above all else when we studied PEO reporting hierarchies. Especially in times of fiscal constraints, reporting has become even more about cost. However, this is not reporting to show how costs are mitigated. Rather, this reporting focuses on obligation rates. There seems to be little concern with holding managers to items mentioned within WSARA Title II policies. The focus is on ensuring funds are obligated fully and on time. None mentioned having to report specifically on any aspect of the WSARA reforms.

2. Reporting Management

Report oversight is another factor used in our research to indicate the importance of what is reported. Those items with greatest oversight are determined to be most important to the PEO and their superiors. Our analysis for this section focused on PEO CS&CSS reporting processes, including the number of reports, and the level of oversight or senior management involvement. The level of oversight varied based on where a respective program fell within the acquisition life cycle. Those programs still in the early phases of the acquisition life cycle stated that they feel there is little oversight to what they do on a regular basis. However, managers

of programs operating in the latter phases of the acquisition life cycle stated they are "over sighted to death."

Although oversight varied depending on acquisition life-cycle phase, there was a consensus that reports were not actually reviewed beyond the PEO level based on the absence of feedback. Often, feedback is received concerning reporting only if there is a combat-related requirement. For instance, if soldiers are wounded or killed in combat while employing a product in their program, this generates changes to an aspect of their product (armor for example), and oversight becomes abundant. Otherwise, for programs in early acquisition phases, there seems to be little oversight as to what is going on in a program. When a problem presents itself in a program is another instance of when report feedback is prominent. Specifically, reports concerning funding problems receive an abundance of feedback along with additional oversight indicating that funding and cost are valued above all other report items.

3. Performance Assessments and the WSARA

Performance evaluations and metrics are a method employed by supervisors to incentivize behavior in congruence with organizational goals. Investigating whether personnel evaluations within PEO CS&CSS included requirements from the WSARA demonstrates the level of the WSARA policies significance to the PEO. We focused our research on specific WSARA aspects including reporting, cost control, and requirements development, and analyzed whether these policies were evaluated in either the civilian or military performance evaluations. We discovered that personnel are not evaluated on (nor evaluate their subordinates on) anything directly stemming from WSARA policies. Considering adherence to policy initiatives when conducting evaluations is something worth implementing for managers and those under their evaluation. Evaluations at PEO CS&CSS are more about percentage of funds obligated or number of upgrades installed, for example, than they are about managing cost, schedule, and performance.

There is discontinuity between civilian and military personnel evaluations as well, according to those interviewed. Civilian evaluations are very vague and do not tell much about their performance unless they did something wrong. The evaluation process is further complicated due to lacking longevity of military personnel within a program office. As such, evaluations become more about what kind of person the military individual is, rather than how they manage a program with regard to items such as those mentioned in the WSARA policies. Because that individual is not in the program from conception through final phases of product acquisition, it is difficult to measure their cost, performance, and schedule contributions.

4. Reporting Effectiveness

We assessed the effectiveness of the PEO CS&CSS reporting process and contents of submitted reports to identify whether inefficiencies exist and to ascertain the implications of continued acquisition reforms (such as the WSARA) on this process. We established that the current reporting process is not effective. The consensus was that the acquisition process itself is very effective. However, everything that is continually added on top of this process, such as WSARA reforms and the reporting requirements that come with reform, take away from the process's effectiveness. There are opportunity costs associated with having to obligate personnel in a program to managing nothing but reporting requirements. This takes away from their abilities to add real value to other aspects within a program.

Additionally, there is little feedback with regard to the reports that they submit on a regular basis. New policies often create new reporting requirements, but acquisition managers are not confident that these reports amount to much more than simply satisfying a requirement to report. Policy reforms that lead to additional reporting requirements appear to be nothing more than another person's (the person implementing the reform) attempt to have their part in history. This leads to ineffective reporting due to the time it takes to generate these reports and the tasks that may fall by the wayside because time was spent reporting rather than managing cost, schedule, performance and risk.

Initial reporting requirements incumbent to the baseline acquisition process are adequate. An acquisition reform such as the WSARA adds to the reporting requirements. As more reform initiatives are made, more reporting is required. Further, no unnecessary or outdated reporting requirements are eliminated. These new and old reporting requirements compound on top of each other until only reporting is happening. The original intent of the reporting is lost, and no one has any idea why the reporting is being done and whether reports are necessary at higher levels anymore.

G. POLICY IMPLEMENTATION AND GAPS

This section presents information demonstrating whether there was deviation from the WSARA's intent and application within PEO CS&CSS, and if so, at what level, and what is actually implemented within programs.

1. Tracking Acquisition Policy

Acquisition policy and reform is constantly being reviewed and updated. This process is managed through policies at all levels of the bureaucracy. Acquisition managers within PEO CS&CSS have challenges tracking changes to policy. Some policy changes or updates to procedure are relatively simple to print and make a

cheat sheet to check program efforts against. However, complex policy reforms and legislative changes such as the WSARA are more difficult, and this difficulty is compounded when one considers that the WSARA is only one of many policy documents requiring adherence.

Additionally, PMs are not pressured to continually check their programs against policy. Resources such as the Defense Acquisition Portal (DAP) and Defense Acquisition University (DAU) were cited as potential sources to consult when searching for policy documents when evaluating programs. But given the amount of policy and reforms that exist, this can be a lengthy process.

True policy reviews come when the program is reaching certain milestone or decision briefings within the acquisition process. At these points, the policymaking personnel scrub documents and procedures against policy requirements, which assists with ensuring the program is in compliance. However, due to the ever-increasing amount of change and reforms that takes place with the acquisition process, the time it takes to process these documents and briefings is also ever increasing.

2. Policy Challenges

The requirements created by the WSARA created bureaucratic challenges. One of the programs mentioned having difficulties implementing competition throughout the life cycle of their program due to TDP issues. The program acknowledges that full and open competition is a requirement; however, if one contractor holds the TDP for a piece of equipment or system, competition is compromised. Purchase of the TDPs from the contractor is often impossible in circumstances where the contractor put the TDPs out of reach from the government by placing such a high cost on the TDPs that it is outside the program's funding capabilities.

Policy reforms and changes are difficult to implement based on how cumbersome the process becomes. When a policy is reformed, it must be implemented. Then personnel must be employed to check policies and generate a database for ensuring a program is evaluated against the policy efforts. Additional personnel are then deviated from their prior duties to start reporting and ensuring that the database and reporting is feeding the individuals who require the reporting. Frustration with this process abounds because it shows that reporting compliance with policy is more significant than actually ensuring correct policy implementation and sound program management.

The major roadblock programs have encountered with implementing the competition policy from the WSARA is the TDP issue. Also, the cumbersome process of tracking, creating metrics to measure a program against, reporting, and

tracking of reporting requirements that are created with each additional change to the acquisition process are disincentives to policy implementation.

3. Policy Successes

The requirements created by the WSARA have created opportunity for success. Being forced to consider trade-offs between cost, schedule, and performance in the early years of a program changes acquisition approaches. Successes have occurred through utilization of the DoDI 5000 process guides, and other instances persist where individuals within their programs utilized various policies to produce rapid results when a combat need was identified.

Positive feedback in programs was not directly linked to WSARA policy. Most positive things that happen in programs result from following acquisition policy and endeavoring to meet the needs of end users. However, the correlation between these positive outcomes and implementation of a WSARA Title II policy is not easily delineated.

V. CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

The final section of this project addresses our research conclusions and recommendations. These items are grouped within the categories of quantitative, organizational and procedural, Title II WSARA, and summary conclusions and recommendations. We initially address statistical conclusions drawn from the DAMIR analysis. The remaining conclusions and recommendations are based primarily on interview trends, as well as any other research findings.

1. Conclusions Summary

There is no direct, measurable linkage between Title II WSARA policies and improvements to processes, organizational structure, costs, schedule, and performance. Priorities and incentives drive the acquisition process. Within the acquisition process and as new acquisition officers, we are constantly counseled to consider cost, schedule, and performance within acquisition programs. Indeed, the research indicated that these three items, along with risk, are equally important. However, as we conducted interviews, discrepancies surfaced regarding how these items are prioritized within a program.

Managers and workers of programs respond to incentives. Incentives present themselves in the form of career advancement, excellent evaluations, praise, and many others. When and why these incentives are delivered to a recipient establish the program's priorities. Therefore, while a manager may say cost, schedule, performance, and risk are equally important, his or her actions in rewarding only when funds are fully obligated lead subordinates to determine that the true priority is money obligated and spent in a program rather than the stated priorities.

Adding to the already numerous policy documents that exist to govern the acquisition process is not the most effective or efficient manner to improve acquisitions. Rather, enforcing requirements for PdMs and other representatives to adhere to the acquisition process while establishing priorities at the PEO level and below (priorities determined from evolving needs and fiscal requirements) and incentivizing all involved to adhere to these priorities will deliver desired improvements.

B. CONCLUSIONS

1. Quantitative

It is clear that MDAP cost variability is in more control on current estimate and PAUC and APUC baseline comparisons since the implementation of the WSARA.

As stated in the data analysis section, we focused on analyzing the measures of central tendency for the selected elements of cost in the current estimate, PAUC change against baseline, and APUC change against baseline from each Army MDAP SAR that was available from 2005 to 2012.

The reader's focus should shift to the coefficient of variation (CV), because this measurement equalizes the playing field because it is has no unit, nullifying actual dollar figures or program baseline estimates and comparing the program standard deviation divided by its average, giving relative magnitude and relative variability. For example, from Jeff Sauro's (2012) website,

> if the mean is 80 and standard deviation is 12, the cv = 12/80 = .15 or 15%. If the standard deviation is .20 and the mean is .50, then the cv = .20/.50 = .4 or 40%. So knowing nothing else about the data, the CV helps us see that even a lower standard deviation doesn't mean less variable data.

We calculated the differences of CV between the samples (for each SAR cost element) before the WSARA and then after WSARA implementation.

For our example, reference Table 1 of this project. All of the MDAPs' APUC CV before the WSARA was 99.01% and after was 81.01%, showing the change of -18.78% in Table 2. For the programs that only decreased in CV, they did so by -85.34%, as shown in Table 2 (with the data computation drawn from Table 1). Each of the values in Table 2 that decreased indicates a cost measurement that is more in control (and less in control if the CV increased).

Since WSARA implementation, the sampled programs have improved in cost control. The spirit of the law intended to have more control on programs and lower costs.

Table 2 summarizes the changes on programs that increased or decreased before the implementation of the WSARA and after. In addition, there is a combined net change in each measurement showing the total change.

Table 2. Summary SAR MDAP Changes in Central Tendency

PROGRAMS THAT INCREASED			
SAR Report Data	*Average*	*Stdev*	***CV***
Current Estimate	$160.09	$900.64	**13.64%**
PAUC % Change	34.88%	0.1803	**58.82%**
APUC % Change	6.10%	0.0671	**33.40%**
PROGRAMS THAT DECREASED			
SAR Report Data	Average	Stdev	**CV**
Current Estimate	$(4,538.13)	$(970.56)	**-14.24%**
PAUC % Change	-7.45%	-0.0596	**-131.12%**
APUC % Change	-9.15%	-0.0655	**-85.34%**
COMBINED NET CHANGE FOR ALL PROGRAMS			
SAR Report Data	*Average*	*Stdev*	***CV***
Current Estimate	$(1,514.21)	$(306.97)	**-2.27%**
PAUC % Change	4.98%	0.0379	**-69.63%**
APUC % Change	-4.06%	0.0125	**-18.78%**

It is clear that MDAP cost variability is in more control on current estimate and PAUC and APUC baseline comparisons since the implementation of the WSARA.

2. Organizational and Procedural Impacts

Our research indicated no true change to organizational structure, task allocation, or administrative functions directly linked to WSARA implementation. The organizational structure, at the PEO level and above, is very structured. This is necessary to establish clear linkages and lines of responsibility from PEO to congressional leaders, DAEs, and others. However, at the PdM level and below, the organizational structure is highly fluid and was different within each program that we interviewed, as were their procedures. The structure was tailored to focus personnel on the priorities of the program. Some PdMs managed people and tasks by functional category (logistics, operations, administration, engineering, etc.) while others were organized by product line or subcategory within the program itself.

This decentralized approach to managing structure and procedures at the PdM level and below is effective and efficient according to program leaders. Although none interviewed stated the WSARA as a reason for changing organizational structure and procedures, it is possible that, due to influence from representatives at the PEO level and above, whose actions may have been

motivated by the WSARA, the reform is partially responsible for some organizational changes.

The research suggests that a negative organizational and procedural impact resulting from acquisition reforms and changes to policy. This negative impact is seen in the increased amount of reporting and tracking or reporting that is required each time new policy is implemented. Increased reporting leads to allocation of resources (personnel and time) to reporting requirements, decreasing resources that have previously been focused on other important management tasks.

3. WSARA Title II Policy Application Conclusions

Title II WSARA policies focus on evaluation of tradeoffs between cost, performance and schedule, prototyping, maintaining competition throughout a program's life cycle, addressing systemic problems, and terminating product lines. Throughout our initial research and program representative interviews, we determined that the acquisition process and policies already have procedures and rules concerning what Title II WSARA requires.

Additionally, not all programs fall in the same space and time within the acquisition process. Therefore, when a new requirement to ensure competition throughout a product's life cycle is implemented in a program in its latter (Operations and Support) phase of the acquisition process, this may lead to schedule delays. The research indicated that, in such programs, the TDPs are often out of their reach. New competition requirements likely require waivers if competition cannot take place, which may result in schedule overruns due to processing delays. This is one example of many possible scenarios where policy changes lead to delays or other tradeoffs within programs.

C. RECOMMENDATIONS

The quantitative findings indicate programs that are lower and more in control on average since the implementation of WSARA. However, a larger sample size of cost data from SARs or other sources would increase statistical significance. Although there is no direct causation identified, there is a clear correlation of the WSARA's impacts on Army MDAPs. We recommend continuing to implement WSARA policy requirements and lessening other acquisition reform to control for the WSARA cause and effect.

To say that each program is the same and thereby should maintain a pre-designated organizational structure at the PdM level and below would force programs to reorient themselves in a manner that is likely to be less capable and less effective than they currently are. PdMs must continually evaluate their organizational structure and procedures in order to determine how to best tailor their

programs to meet the requirements in accordance with where their program falls in the acquisition process and priorities established by their PEO and above.

PEO and above representatives should be responsible for establishing procedural and organizational priorities that are in line with policies and reforms. People respond to incentives and react according to that which is rewarded. When PEOs establish priorities and evaluate based on these priorities, it ensures PdMs focus on those priorities without needing to know each change to policy that occurs.

Our research found that policymakers may not be evaluating whether a policy reform is required prior to implementing a change. In other words, policy changes become more about a policymaker wanting to make his or her mark on history while responding to pressures from external forces, such as public criticism to fix military acquisitions. Thus, a change becomes implemented that requires reporting, waivers, and tracking, or all of these items, resulting in a potential detriment to effective program management.

Policymakers must evaluate the baseline acquisition process and its supporting policy by ensuring that reforms are not made when they are not needed. Further, reforms need not be repetitive in nature. When repetitive changes are made to policies, this is an indicator that incentives and priorities are mismatched. A new reform is not necessary. Rather, PEOs and PdMs need to understand what their priorities are and be managed through incentives to adhere to those priorities.

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