

Army Strong: Equipped, Trained and Ready

Final Report of the 2010 Army Acquisition Review

Chartered by the Secretary of the Army



January 2011

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE JAN 2011		2. REPORT TYPE		3. DATES COVERED 00-00-2011 to 00-00-2011	
4. TITLE AND SUBTITLE Army Strong: Equipped, Trained and Ready				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Secretary of the Army, Army Acquisition Review Board, 1400 Defense Pentagon, Washington, Dc, 20301-1400				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 246	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Army Strong: Equipped, Trained and Ready

Final Report
of the
2010 Army Acquisition Review

Chartered by the
Honorable John M. McHugh
Secretary of the Army

January 2011

PREFACE

The Army continues to need modern equipment for soldiers to be decisive on the unpredictable, asymmetric battlefield of today and tomorrow. This need for modern equipment will be even harder to fill amid the nation's economic difficulties. Our study found four challenges in meeting this requirement.

First, Army requirements and acquisition core competencies have eroded in the last two decades and are in urgent need of repair.

Second, the Army has reduced the number of qualified people essential to acquiring modern equipment. The number and qualifications of systems engineers, operations and cost analysts, and contracting officers, particularly those in uniform, are inadequate. While the ranks of oversight staff responsible for process are rising, the number of qualified, accountable professionals charged to develop and produce the product is dwindling. Program Executive Officers (PEO), who are charged with the development and procurement of systems in response to user's needs, are funding the development of requirements, analyses of alternatives and user's representatives (Training and Doctrine Command Capability Managers). These activities and the people who perform them must be funded from their base budgets. Hence, the problem lies not in a shortage of money for the existing workforce, but in how it is allocated.

Third, the whole acquisition process starts with requirements. The Army has been quick in dealing with urgent needs, bypassing the laborious acquisition process. However, the 'normal' process is anything but rapid. The current process is not collaborative, but sequential with multiple opportunities for oversight staffs to question and challenge requirements. The mean time to approve an Acquisition Category (ACAT) I system requirement is 15 months with an ACAT II taking 22 months and an ACAT III taking 18. When these requirement approvals and their associated acquisition milestones are not synchronized with the Program Objective Memorandum and budget cycles, program starts can occur two and three years after the operational need was identified. Further, program continuations can likewise be delayed...extending development time and cost.

Finally, Army acquisition has proved ineffective and inefficient, as demonstrated by the 22 major acquisition programs terminated since the end of the Cold War. In an attempt to not repeat past failures, additional staff, processes, steps and tasks have been imposed. While well intended, collectively these modifications are counterproductive. Department of Defense Directives and Army Regulations recognize different types and complexities of systems and call for 'tailoring' of the steps and tasks. However, current implementation of the regulations has resulted in most new developments, regardless of their simplicity, having to perform all the steps and produce all the documentation of the most complex, technically challenging development. Even with this laborious process, new weapon systems continue to enter engineering and manufacturing development prematurely with technological risk, leaving a legacy of program cost overruns, reduced quantities fielded and terminations. Technology development should be completed before Engineering and Manufacturing Development.

Our review calls for the Army to:

- Realign, resource and focus its requirements and acquisition professionals on their *raison d'être* and associated core competencies, i.e., Training and Doctrine Command's timely delivery of requirements; PEO and Program Manager delivery of products meeting the requirement on cost and on schedule; and Army staffs that are accountable for enabling the requirement to be met.
- Involve all stakeholders collaboratively in requirements development, development planning and acquisition solicitation, rather than just critiquing others.
- Realistically assess and manage risk, and follow more tailored evolutionary acquisition strategies with associated reductions in steps, time and documentation to provide new systems.
- Improve the number, quality and accountability of the people essential to the acquisition of equipment and systems needed for our servicemen and women to be equipped, trained and ready.

CONTENTS

Preface.....	iii
Executive Summary	vii
Acknowledgments	xxvii
I. Introduction	1
I.1 Charter.....	1
I.2 Membership	4
I.3 Review Approach.....	6
I.4 Interviews.....	7
I.5 Major Problems.....	12
II. Findings.....	29
II.1 Requirements Development Is Broken	31
II.2 Risk Management Is Deficient.....	39
II.3 Big 'A' Is Not Aligned.....	47
II.4 Requirements and Acquisition Resources are Inadequate	61
III. Recommendations.....	81
III.1 Requirements Development	83
III.2 Risk Management Not Risk Aversion	97
III.3 Align Organizations, Incentives and Accountability	113
III.4 Resources	123
IV. Implementation Of Recommendations	137
Appendix A. Additional Figures	155
Appendix B. Supporting Information	163
B.1 Lost Opportunities: Army DT&E 1995 – 2009	163
B.2 FLIR Special Task Force.....	165
B.3 Acquisition Workforce	169
B.4 Statutory Document Requirements	181
B.5 Regulatory Document Requirements.....	185
Acronyms	187
References.....	195

EXECUTIVE SUMMARY

“We need an agile system that rapidly develops, purchases, and fields innovative solutions for our soldiers. . . .” – Army Secretary John McHugh

The Secretary of the Army commissioned a study of the Army’s acquisition system by an independent panel. This study was to support a broader effort by the Army to develop an integrated business management system. It was also to address specific concerns that the Army’s acquisition efforts had become less effective and efficient since the end of the Cold War.

The terms of reference for this Army Acquisition Review stated that it “should provide a blueprint for actions over the next one to two years to improve the efficiency and effectiveness of the Army acquisition processes.” To help provide focus on specific areas of concern, the study charter specified a number of areas the panel was to examine. Specifically the review was to address and provide recommendations in the following areas:

- Requirements Processes: responsibilities, authority and required skills.
- Acquisition Work Force: manning levels, required skills, recruiting, education, training and career management.
- Organization/Policies: all involved Army organizations and other stakeholders, including the Office of the Secretary of Defense (OSD) and the Congress.
- Funding: realistic costing, management of the Program Objective Memorandum (POM) cycle and budget stability.
- Key Acquisition Processes: DoD 5000 Series, rapid acquisition, technology and system development, testing, contracting, evolutionary upgrades, life cycle sustainment, etc.
- External Relationships and Oversight: previous acquisition reform initiatives, Congress, federal acquisition regulations, OSD, etc.
- Acquisition Programs: lessons learned from successes and failures.

This Executive Summary highlights many of the panel’s recommendations to substantially alleviate the problems currently preventing effective, efficient and timely acquisition of materiel and services required by warfighters. The review panel found numerous essential actions, and it will take a concerted effort by the Army to implement these. The gravity and

scope of the problems necessitate comprehensive, urgent action if the Army is to improve significantly its acquisition of materiel and services.

The panel interviewed over 100 individuals with broad experience in the challenges of Army acquisition. These individuals included current and/or former: Deputy Secretary of Defense; Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L)); Director, Defense Research and Engineering (DDR&E); Director, Operational Test and Evaluation (DOT&E); Army Chiefs of Staff; Under Secretaries and Assistant Secretaries of the Army; Defense and Army Acquisition Executives; Training and Doctrine Command (TRADOC) Commanders; Army Materiel Command (AMC) Commanders; Army Program Executive Officers (PEO) and Program Managers (PM); and former Chief Executive Officers (CEO) of major defense companies. The panel also reviewed scores of prior acquisition studies; applicable laws, policies and regulations; and finally developed findings and recommendations.

Nearly all those interviewed for our review were unanimous that the current acquisition of materiel and services for the warfighters needs major surgery to improve its effectiveness. They also expressed the view that most of the problems could be remedied by the Army leadership.

“Acquisition process is ‘workman-like’...it does the job, but poorly.” – Former Assistant Secretary of the Army

“Too many people can say no.” – Former DUSD

“Schedule should be the first priority when responding to the immediate needs of soldiers in combat.” – LTG (USA)

“The analysis process is broken.” – Former VCSA

“We are rapidly equipping the current fight. The problem is that the current deliberate acquisition process won’t get us the 3-7 year solution.” – OSD Principal

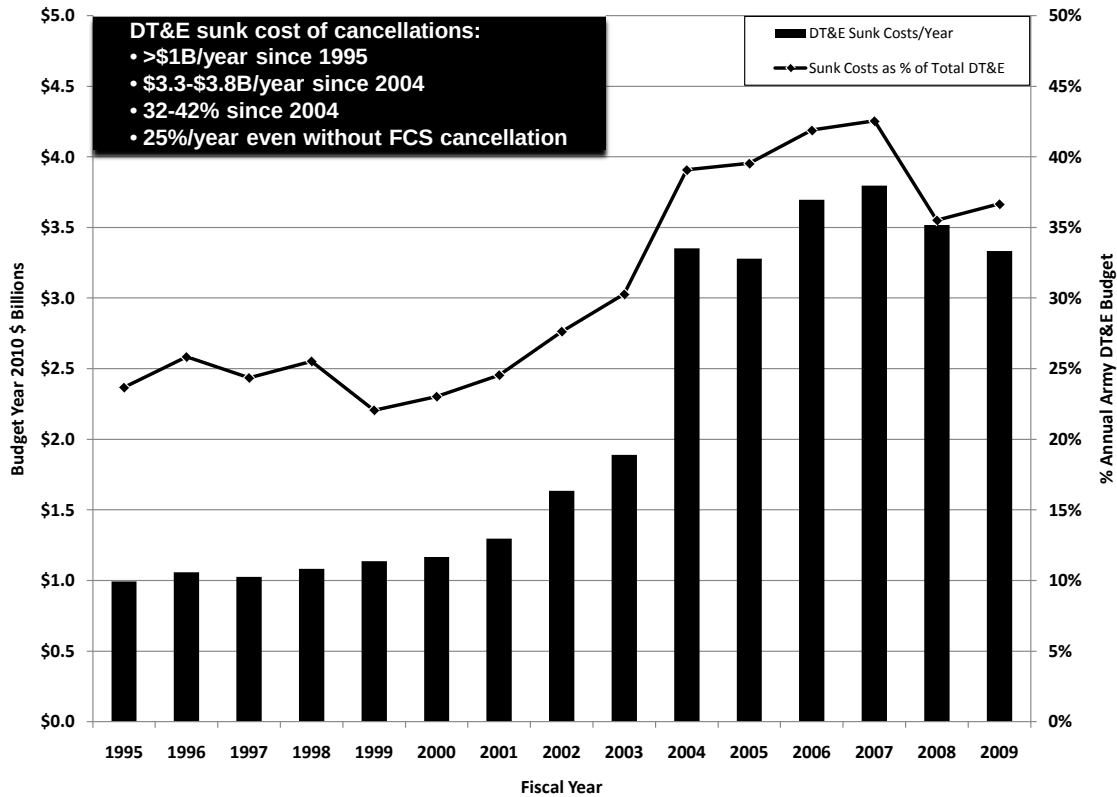
The Problem

The Army has increasingly failed to take new development programs of record into full rate production. From 1990 to 2010, the Army terminated 22 Major Defense Acquisition

Programs (MDAP) of record before completion. During the period 1990-2000 seven were terminated and 15 have been terminated since 2001.

This track record of too many cancellations, schedule slippages, cost over-runs and failures to deliver timely solutions to the warfighters' requirements is unacceptable. The Army cannot afford to continue acquiring materiel the way it has in the last two decades.

The Future Combat System (FCS) termination casts an enormous shadow over any debate about challenges in the Army acquisition system. Yet it is important to note that these challenges predate FCS. Even when we exclude funding spent on the now-terminated FCS program, the sunk costs of terminations amount to approximately 25% of available Development Test and Evaluation (DT&E) funding (that is, Research, Development, Test and Evaluation funding less Science and Technology funding) per year. Every year since 1996, the Army has spent more than \$1B annually on programs that were ultimately cancelled. Since 2004, including FCS, \$3.3B to \$3.8B, or 35% to 42%, per year of Army DT&E funding has been lost to cancelled programs. The Army cannot afford to continue losing funds in this manner.



Source: OASA(ALT) WARBUCS
Note: DT&E = RDT&E – S&T

Army DT&E Funding Lost on Cancelled Programs

The panel found the Army's documented reasons for cancellation to be too general and sometimes in direct conflict with the facts based on personal experience with many of the 22 programs and discussions with others familiar with them. There are many different causes that contribute to a program's cancellation, but it is also true that many cancelled programs shared several of the same problems. A few were cancelled because the threat changed; however, more common causes included:

- Overly optimistic forecast of funding available for Army modernization.
- Weak baseline, modeling, trade studies or analysis of alternatives.
- Unconstrained weapon system requirements.
- Underestimation of risk, particularly technology readiness levels.
- Failure to eliminate technological risk prior to Milestone B (MS B) approval.
- Program skipped or under-resourced pre-MS B prototyping.
- Too many programs started only to prove unaffordable in the budget and Future Years Defense Program (FYDP).

- Affordability reprioritization.
- Schedule slip.
- Requirements and technology creep.
- Cost overruns.
- Program restructured, quantities cut, unit costs skyrocketed and program support lost.

During the period when these programs were being cancelled, the Army experienced erosion in the core competencies of the personnel responsible for the development of requirements and the acquisition of systems and services. This was particularly true in the case of military operations and cost analysts in TRADOC; AMC; Office of the Assistant Secretary of the Army, Acquisition, Logistics and Technology (ASA(ALT)); and the Army Staff. The primary reasons for this erosion were the initiative begun in the mid-1990s to reduce acquisition personnel and the drive since 2001 to reduce the generating force and increase the operating force to cope with the Global War on Terror. Unfortunately, this has had unintended deleterious consequences on the Army's ability to acquire materiel and services.

As a result of these problems, Army leadership, OSD, Capitol Hill and industry have lost trust in the Army's acquisition processes and capability to effectively provide warfighters the equipment and services they require in a timely manner. Interviewees did express the view that, in spite of the shortcomings in the acquisition processes, today's Army is the best equipped in the world. To a large degree this can be attributed to supplemental appropriations and rapid acquisition processes employed during the last nine years. Those appropriations are not expected to be available in the future. Hence, the requirements, resourcing and acquisition communities must change the way they provide warfighters the capabilities needed to remain the best equipped Army in the world.

Compounding the problem is the Congressional Budget Office (CBO) forecast that servicing the interest on the federal debt will equal the DoD budget by 2018, which will likely result in defense budget reductions necessitating lower, more effective and more efficient expenditures for Army acquisition, logistics and technology.

Necessary Corrective Action

Actions that the Army must take in an expedited manner to correct these problems fall into four primary categories:

- Make the requirements process collaborative and timely.

- Emphasize an informed management of risk, rather than being so averse to risk that initiative is stifled.
- Refocus on core competencies, align acquisition organizations and enforce accountability by all stakeholders in acquisition.
- Provide adequate resources to restore core competencies in requirements development and acquisition workforces.

Make Requirements Process Collaborative and Timely

Some personnel interviewed expressed the view that a requirement should only state the operational need and not be constrained by either technology or cost. If such a requirement were approved, industry would be expected to meet it even if the technology was high risk and the cost of satisfying the requirement was high. The development of a requirement for materiel capability can originate in a number of places, but most frequently it originates with the warfighter as an Operational Needs Statement (ONS). TRADOC is responsible for writing the requirement, which is then validated and prioritized by the Army G-3 and approved by the Army Requirements Oversight Council (AROC). For Acquisition Category (ACAT) I and special-interest items, the requirements document must then be forwarded to the JCS for staffing and eventual Joint Requirements Oversight Council (JROC) approval. There are multiple reviews with challenges and questions at the Department of the Army (DA), Joint Chiefs of Staff (JCS) and OSD levels, requiring time-consuming restaffing. This heel-to-toe approach often results in the requirement going back to TRADOC repeatedly to answer questions or modify the document. This lack of a collaborative approach to requirements development results in a current mean time for approval of an ACAT I requirements document of 15 months. The average time for ACAT II systems is 22 months, and for ACAT III systems it is 18 months.

Army Regulation (AR) 71-9 provides for collaborative requirements development with an Integrated Capabilities Development Team (ICDT). Unfortunately, TRADOC has no authority to require participation, but can only “invite” those who choose not to participate and will later critique the requirement. This lack of authority has resulted in inadequate participation of personnel from organizations other than TRADOC during the development of requirements.

During the current Global War on Terror, an expedited requirements approval process has been developed for approval of an Urgent ONS (UONS) or a Joint UONS (JUONS) submitted

by warfighters. These UONS and JUONS have largely been met by rapidly accepting the submitted requirement, using developed technologies and employing supplemental appropriations. Unfortunately, there is no similar procedure for quiescent periods or discretionary funding to support requirements during those periods.

If approval of a requirements document, a Materiel Development Decision (MDD), MS A decision or MS B decision is not aligned with the DA POM and budget development schedules, there can be a delay of up to a year or more in receiving necessary funding to move out on a program.

Key Recommendations to Address These Issues:

- A TRADOC-led ICDT with personnel from the Army Staff (ARSTAFF) and Secretariat, AMC, Army Test and Evaluation Command (ATEC) and other Army commands should collaboratively develop requirements documents for AROC approval of most programs:
 - Amend AR 71-9 to give the TRADOC commanding general (CG) the authority to task non-TRADOC organizations for ICDT participation.
 - ICDT representatives must have the authority to speak for and commit their organizations.
- For key ACAT I programs, establish a Special Task Force (STF), chartered by either the Chief of Staff of the Army (CSA) or the Secretary of the Army, that is:
 - Co-chaired by a TRADOC Major General (MG) and an acquisition general officer (GO) or member of the Senior Executive Service (SES) technically qualified for the system pursued.
 - Conducted off-site, outside the Washington, D.C., area, for a finite period of performance.
 - Convened as necessary to prepare for the MS A and B decisions.
 - Organized and populated with experienced, qualified talent from the Army Secretariat, ARSTAFF, TRADOC, AMC, ATEC and other Army Commands with the authority to commit their organizations – Invite members of the JCS, DOT&E and OUSD(AT&L) as appropriate.
 - Tasked to collaboratively develop and provide to the Army Acquisition Executive (AAE), AMC and TRADOC a comprehensive, consistent set of requirements, acquisition milestone decision products and source selection documents.
 - Used to draft a Request for Proposals (RFP) and assess comments received.

- Prepared to provide some STF members to serve on the Source Selection Evaluation Board (SSEB) or Source Selection Advisory Committee (SSAC).
- Reduce the current practice of serial (saw-tooth) TRADOC-Army-Joint staffing and approval of requirements, acquisition and testing documents.
- CSA recommend JCS terminate the current Joint Capability Integration Development System (JCIDS) process

or

Require collaboration by J-8 and appropriate Joint Staff with the Army during the requirements development process.

- Institutionalize rapid acquisition in policy guidelines and amend AR 71-9 to support rapid acquisition in response to ONS from Combatant Commands (COCOM) during quiescent periods.
- Request rapid acquisition discretionary funding for ONS to support COCOMs during such periods.
- Synchronize TRADOC and Army requirements approval, MDD, MS A and MS B decisions to align with the DA POM and budget development schedules.

Risk Management – Not Risk Aversion

The Army acquisition culture has increasingly become risk averse, placing more attention on not repeating mistakes than on identifying and managing risk for the best outcome. The result is many cancelled programs; delays in fielding needed capabilities to the operational force; lost sunk costs in the billions along with the associated opportunity costs; the development of unnecessary documentation; counterproductive, costly government and industry overhead; and increasingly dissatisfied customers. Even with a laborious requirements development process, new weapon systems continue to enter engineering and manufacturing development (EMD) prematurely with technological risk resulting in cost overruns, reduced quantities fielded and terminations.

It is not a surprise that many of the myriad of previous studies on acquisition reform contained similar recommendations to improve the acquisition process. Unfortunately, in too many cases, attempts to implement the recommendations resulted in the ‘unintended consequences’ of adding more layers and obstacles to acquiring systems. This was often more counterproductive laws, policies and regulations which stifle initiative of the individuals and organizations responsible for the success or failure of a development program. Line

management accountability has been replaced by “Too many can say No, but too few can say Yes.” Moreover, many of those who can say “No” add nothing to the process, other than slowing it down.

The pre-MS B process has become bloated with numerous reviews and deliverables appealing to a growing collection of interests that add little value. There are too many staffers issuing ‘guidance’ or ‘direction’ who are not accountable for the impact they have on a program.

Although the DoD 5000 series advocates tailoring the acquisition strategy to what is most appropriate to the scope and nature of the program, the bureaucratic impediments to complying have not been removed; these incentivize risk aversion, not proper risk management.

Numerous acquisition studies and DoD directives have recommended competitive prototyping at the component, subsystem and even system level prior to EMD to reduce technical, schedule, cost and performance risk. Pre-EMD subsystem and system prototyping were a major benefit in many of the successful programs studied. Unfortunately, acquisition strategies too often omit this in order to shorten the schedule and lower development cost, only to result in more development time and cost due to technical problems during EMD that could have been prevented with competitive prototyping. Similarly, during development many programs do not invest sufficiently to reduce eventual life cycle costs.

Our interviews revealed that Technical Data Packages (TDP) are not being procured as much as they should be. Furthermore, during system development the government has the leverage to get a useful TDP at a fair price. If TDPs are bought after EMD, the government runs the risk of buying something that is inadequate for re-compete not just at the system level, but also the subsystem and component level. When armed with a sound TDP, the Army has been able to successfully break out subsystems and components, and achieve rewarding price competition during production.

The Technology Readiness Level (TRL) construct has too often been misunderstood or inconsistently applied. TRLs are intended to measure the state of technology maturity prior to proceeding past MS A and B. Unfortunately, TRL definitions and the reliability of TRL assessments have not been consistent. Adding properly defined Integration Readiness Level (IRL) and Manufacturing Readiness Level (MRL) criteria for use in determining readiness to

enter the EMD, and the production and deployment phases of acquisition would remove another risk area.

Counter to its purpose, Independent Research and Development (IRAD) has become near-term focused on what is needed to win the next contract, which is more a Bid and Proposal (B&P) activity. The Army needs visibility into the IRAD work by a given company. The Army should reinstitute on-site reviews of company IRAD efforts. They should not be a grading exercise; rather they should be an exchange of information by subject matter experts. Proprietary information must be respected by both the Army and industry. These exchanges can inform the Army of potential systems concepts and technology advances, and can inform industry of potential government requirements.

International Traffic in Arms Regulations (ITAR) restrict U.S. companies from domestic and foreign sale of their technologies. They are therefore a barrier to getting U.S. companies to bid on defense projects and to commercially and internationally advance their technologies. The end result is U.S. defense-related technology not remaining ahead globally. ITAR and the failure to remove items from the restricted lists when no longer valid are serious hurdles to leveraging commercial research, technology and products.

Key Recommendations to Address These Issues:

- Review, approve and manage programs by risk, not just scope and cost:
 - Focus pre-MS B resources on getting the requirement right and eliminating technology risk prior to MS B.
 - Restrict acquisitions entering EMD with technological risk to only ‘game changing’ military capabilities.
 - Encourage and fund competitive pre-MS B prototyping of systems, subsystems and components.
 - Expand use of fixed price and incentive fee contracts consistent with risk.
 - Expand the acquisition of TDPs during the development stage when the government has the most leverage and compete using the TDP during system acquisition and sustainment phases consistent with the risk-reward.
 - Limit documents to only those essential to approve a development program.
 - Adhere to TRL definitions to assess technological risk.

- Properly define and promulgate Integration Readiness Level (IRL) and Manufacturing Readiness Level (MRL) criteria for use in determining readiness to enter EMD and production.
- Give priority to vertical technology insertion (VTI) and horizontal technology integration (HTI) of proven advanced technologies via evolutionary acquisitions with growth capacity.
- Improve oversight of industry technology:
 - Reestablish the difference between IRAD and B&P.
 - Increase Army visibility into contractors' IRAD programs, but site reviews should be to exchange information, not just a grading exercise.
 - Build “high walls” around small, critical areas, rather than subjecting commercial products to ITAR restrictions.
 - Continue strong participation in the export control reform process.

Align Organizations and Accountability

Many interviewees expressed the view, real or perceived, that the traditional partnership between the ASA(ALT) and the Vice Chief of Staff of the Army (VCSA), which served Army acquisition well, has eroded in recent years, perhaps due in part to the heavy pressures of continuous combat deployments. Previously, AR 70-1 designated the VCSA as co-chair of Army Systems Acquisition Review Council (ASARC); General Order 3 dropped that responsibility from the VCSA and identified the ASA(ALT) as sole chair of the ASARC in 2002. The ASARC is the body that recommends actions to the AAE for final acquisition decisions. The Defense Acquisition Executive (DAE) and the AAE are the milestone decision authorities and sign the Acquisition Decision Memoranda, as appropriate to the ACAT classification of the program.

Capability Portfolio Reviews (CPR) are intended to conduct an Army-wide, all-components revalidation of requirements. The approach is to holistically examine, validate, modify or make recommendations to terminate requirements driving capability development, acquisition and sustainment across a series of portfolios. Having the VCSA and ASA(ALT) co-chair the first session of the materiel CPRs would further restore the traditional partnership discussed above. Codifying CPRs in an Army Regulation will give assurance that the process will be continued when leadership changes. The responsibilities and accountability of

participants in a CPR should be clearly defined. The CPRs should be expanded in the future to review the interdependencies across portfolios.

As explained in the Army Science and Technology Master Plan (ASTMP), the Army issues Army Technology Objectives (ATO) and priorities guidance to the science and technology (S&T), materiel and TRADOC communities on an annual basis. The Army S&T Working Group (ASTWG) is co-chaired by the Deputy Assistant Secretary of the Army, Research and Technology (DASA(R&T)) and the G-8 Force Development. The Army S&T Advisory Group (ASTAG), co-chaired by the ASA(ALT) and the VCSA, annually validates the ASTWG recommendations. The ASTWG and ASTAG schedules are not synchronized with the POM and budget schedules, resulting in a failure to properly fund priority programs in the POM and budget.

There is a lack of alignment among Battlefield Operating Systems (BOS), defined by FM 41-10; Warfighting Functions, defined by FM 3-0; TRADOC Centers of Excellence (CoE), defined by TRADOC Regulation 10-5-1; VCSA Capability Portfolios and PEOs. Better alignment of these stakeholders, their organizations and their methods for storing, retrieving and analyzing acquisition data will enhance transparency, coherence, productivity and efficiency.

A strong DA Systems Coordinator (DASC) organization staffed with Acquisition Corps military officers of grade and experience commensurate with their G-3 and G-8 peers is essential to restore the triad of the DASCs, System Synchronization Officers (SSO) and Program Analysis and Evaluation (PA&E) action officers. This triad effectively balanced budgets, requirements, priorities and executability, and kept PMs aware of issues developing in the ARSTAFF and the Army in the field. The panel considers this to be an 'inherently governmental function' best served by uniformed, skilled personnel. It is an important step in developing O-4 and O-5 rank officers to become PMs and TRADOC Capability Managers (TCM).

AMC Life Cycle Management Centers (LCMC) should be responsible for post fielding operational logistics. The Army needs to remove the confusion as to their mission and clarify their role in life cycle logistics vis-à-vis PMs. PMs should be responsible for acquisition logistics during development and through successful Initial Operational Capability (IOC). Operational logistics subject matter experts from the appropriate LCMC should be part of the

PM's office during development to assure the system is designed properly to reduce eventual sustainment costs, e.g., reliability, increased mean-time-between-failure, etc. PEOs and PMs were created principally to bring professionalism to the development, qualification, production and fielding of military systems, and to improve cost, schedule and performance. They should be refocused on this role. Asking them to also be operational sustainment experts is mission creep and a diversion of their management attention away from their primary responsibilities.

The aggregation of the Army Materiel Systems Analysis Activity (AMSAA), the Army Research Laboratory (ARL) and the Research, Development and Engineering Centers (RDEC) of the LCMCs into a Research, Development and Engineering Command (RDECOM) with a large headquarters has not added enough value to be continued. There is no evidence of major eliminations of redundant effort, significant leveraging of defense and commercial technology advancements or more products resulting from HQ RDECOM actions. The RDECs should report to their respective LCMC commanders with staff oversight of their efforts by a MG or SES 5 Executive Director for Research, Development and Acquisition (RDA) reporting directly to the CG AMC.

Every PM and PEO interviewed knew they are accountable for meeting cost, schedule and performance thresholds during development of a system. This was not the case with some staff officers and civilian employees in AMC, TRADOC and HQDA, who are not held accountable to act in concert with PMs to resolve issues, hold down costs and meet schedules. Similarly, many Integrated Product Teams (IPT) are also not held accountable for supporting PMs. The panel found no Army policy establishing the accountability of staff officers and IPT members in helping the PMs meet established costs, schedule and performance objectives.

Nearly all of the interviewees expressed the view that the Army requirements, resourcing and acquisition processes were ineffective and inefficient. Some went so far as to say that the Army acquisition process is broken. Former industry CEOs and others closely associated with industry indicated that the relationship with industry is strained because of poor communication between the two parties. They expressed the common view that Advanced Planning Briefings for Industry Days are not successful because competing companies are not going to ask substantive questions or make recommendations in the presence of competitors. They believe one-on-one meetings with the Army are essential and expressed the view that legal restraints to such meetings are overplayed by the Army.

Key Recommendations to Address These Issues:

- The VCSA should co-chair the ASARC with the ASA(ALT); ASARC will make appropriate recommendations to the AAE.
- Capability Portfolio Reviews:
 - The VCSA and the ASA(ALT) should co-chair Session 1 of the materiel CPRs.
 - Codify the conduct of CPRs in an Army Regulation.
 - Include a requirement to review the interdependencies across portfolios.
- Synchronize the ASTAG and ASTWG cycle with the POM submission cycle.
- Improve the alignment among the PEO structure, Equipping PEG, BOSs, CPRs and TRADOC Centers of Excellence.
- Rebuild the highly efficient and effective triad of the military DASC, SSO and PA&E Action Officer (AO) at the O-4/O-5 level, with 'knowledge authority' and locate in the Pentagon.
- Make PMs lead/accountable for acquisition logistics during development through successful IOC fielding and LCMCs lead/accountable for post-fielding operational logistics.
- Disestablish RDECOM and return the RDECs to the LCMC Commanders.
- Establish a MG or SES 5 Executive Director for RDA reporting directly to the CG AMC.
- CMO should promulgate policy and develop metrics for line and staff accountability in Army acquisition.
- Army leadership must improve communication with industry.

Provide Adequate Requirements and Acquisition Resources

The Army lost its single, independent and credible voice for operations research and systems analysis (ORSA), requirements, prototyping, experimentation and testing across the Army, at OSD and on the Hill with elimination of the Deputy Under Secretary of the Army for Operations Research (DUSA(OR)) in 2006.

AMC has placed the majority of its analytic capability in two organizations, AMSAA and Survivability and Lethality Analysis Division (SLAD) in RDECOM, and its Logistics Support

Activity (LOGSA) under the AMC G-3. AMSAA, the key analytical group for AMC, is a separate reporting organization in RDECOM, and the analysts of the SLAD are buried in the Army Research Laboratory under the Deputy CG of RDECOM. This organizational relationship does not provide AMC with a unified, effective analytic organization to conduct, coordinate, prioritize and supervise the quality of studies and analyses within AMC.

The Army should have an organic capability to lead pre-Milestone A development planning, including: systems concept formulation, exploration of promising advanced technology concepts, formulation and advocacy of advanced programs before there is a Program Manager assigned, and an honest broker for the prioritization of required technology programs. The Advanced Systems and Concepts Offices in the RDECs were created to do this, but have been either eliminated or marginalized to where they are incapable of performing their traditional, critical advanced concept development, parametric design and analysis, technology assessment and RDT&E planning functions.

A recurring complaint by interviewees was that the shortage of qualified system engineers and quality assurance personnel has been a serious deficiency in program development. Many of these personnel were lost in the reduction of acquisition personnel. The belief that the contractor could perform these functions while serving as a lead system integrator has not proven successful.

The acquisition of Army materiel requires analyses to determine materiel needs and subsequent analyses to conduct tradeoff determinations, cost-benefit analyses and analyses of alternatives (AoA). Within TRADOC, only 56% (52% Functional Area (FA) 49 and 59% 1515) of the required analysts are authorized. Compounding this problem, the fill of authorized military analysts is only 56%, meaning that only 29% of the required military analysts are on hand. In addition, AMSAA has a requirement for 15 military analysts, but is authorized only one. This compares to 31 required and 29 authorized in 1991. In the case of analyses of materiel systems, cost must be an independent variable and yet the Army has drastically reduced its cost analysis capability. Cost estimates of a potential program during MS B preparation require skilled analysts who use appropriate cost models to estimate futures costs. Such models with associated cost databases are not sufficient today.

Filling these critical shortages with qualified systems engineers, quality assurance personnel and analysts will take time. In the meantime Federally Funded Research and Development

Centers (FFRDC) and University Affiliated Research Centers (UARC) have these skills, which could be contracted to fill this critical void until qualified government personnel are available. These centers have no conflict of interest and can provide independent assessments because they would not participate as a member of the contractor team developing an approved program.

Because of the demand for the limited number of Acquisition Corps GOs, few complex ACAT I programs have been led by GOs. Past experience of successful programs has shown the importance of GO leadership during the development of the M-1, M-2/3, AH-64, UH-60, etc. Because of the importance of the Ground Combat Vehicle (GCV) to the Army, it is appropriate for it to be managed by a GO.

Most successful PEOs and PMs have spent the majority of their careers in a particular commodity area such as missiles, combat vehicles or aviation. Unfortunately, the Army made the decision some time ago to move some PMs and PEOs among commodities, which do not make use of their expertise in a particular skill set.

TCMs provide a user perspective balance to Army Acquisition Corps (AAC) PMs. TCMs should be operationally experienced and not members of the AAC. The Army Logistics University has a two-week resident Capabilities Development Course which provides excellent training for any new TCM. TCMs are rarely assigned to a single development program; rather they are assigned to work with PMs of a number of related programs. This is unfortunate in the case of a key ACAT I program like the GCV where an operationally experienced TCM is needed to provide the user perspective to the PM on a frequent, often daily basis. The panel also found that the majority of TCMs depend on reimbursement funding from PMs and PEOs for their expenses. This does not provide them the independence they need as the operational counterpart of PMs and PEOs.

The fast pace and system requirements of the wars in Iraq and Afghanistan have focused the AAC on meeting the demands of the operational force. As a result, AAC officers are not sufficiently knowledgeable of current tactics and threats, nor have they spent much time with their operational counterparts at Command and General Staff College (CGSC) and the Army War College (AWC). Outstanding field grade AAC officers with potential to serve as MDAP PMs could be assigned to S-3/G-3 or S-4/G-4 staff positions at brigade or division

levels in operational units for short tours (1 to 1.5 years), without reducing the host tactical unit's operational personnel fill.

Approximately 40% of both AMSAA and TRADOC Analysis Center's (TRAC) funding comes from reimbursement, often from PMs and PEOs, to conduct analyses on specific program issues. While much of this reimbursed work is important, it is not limited to the basic analyses required for: capability development; Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF); tradeoffs; AoAs and engineering analyses. This level of reimbursement denies both organizations the flexibility to address critical acquisition-related analyses, particularly as the demand for them is increasing. AMSAA and TRAC have each documented an annual requirement for \$10M above current mission funding for AoA analyses to cover this historical resource shortfall.

The Army engineering and force-on-force models used by AMC and TRADOC to conduct analyses are not adequate to analyze systems in stability operations and irregular warfare involving paramilitary forces and large numbers of noncombatants who can influence military operations. This weakness precludes the Army from conducting credible analyses of materiel in the operational environment in which it will be used to determine capability shortfalls and to assess and justify new materiel.

The G-8 needs to assess the capabilities, contribution to Army force effectiveness and costs of existing and proposed systems within portfolios, but it does not have an analytic tool to support this effort. The VCSA needs the same capability to support the conduct of CPRs. Even more critically, both the G-8 and the VCSA need analytic tools to aid in examining capabilities, contribution to force effectiveness and costs across capability portfolios. The Army does not have such tools and needs to develop and validate them to enable the conduct of credible CPRs and tradeoffs among portfolios to support POM and budget decisions, and to justify modernization investment strategies with OSD and the Congress.

During our interviews, funding instability was cited by many of the PMs and PEOs, as well as by industry contractors, as one of the major threats to meeting their program baseline cost, schedule and performance. The annual budget exercises within the Army and in the other Services often create the need for bill payers, and frequently ongoing major programs are taxed. During our fact-gathering, two potential actions were cited to mitigate this problem. In the 1970s, Army top leadership fenced the funding for the 'Big 5', thereby largely

protecting them from the bill payer exercise. The USD (AT&L), the 2006 Quadrennial Defense Report (QDR), the 2006 Defense Acquisition Performance Assessment Report and FY2006 National Defense Authorization Act all recommended a 'capital account' to fund ACAT ID baseline programs. In essence, this would fence the funding for approved ACAT ID programs. When DoD initiated a pilot program in FY2008 to explore this, the Army appeared uninterested.

It is extremely difficult to predict the future, so the Army should concentrate its development efforts and resources on those programs which the operational force will need in the next three to seven years, and restoring requirements development and acquisition core competencies.

There is no database to guide one to appropriate programs, issues, trends, solutions and successes in acquisition programs. The ASA(ALT) has some lessons learned and data, the various warfighting centers have some, and the testers have their own, but none are connected and provide a coherent description of what worked, what failed and why, and what is needed now. Hence, there is no realistic, formal way to track successes, analyze failures and develop 'best practices' and 'lessons learned' from past acquisition programs.

Key Recommendations to Address These Issues:

- Reestablish the position of the DUSA(OR) and staff the office with nine people, including three military analysts.
- Combine analytical capability within AMC (AMSAA, SLAD and LOGSA) into a single organization reporting to the AMC Command Group.
- Establish and resource Directorates for Advanced Systems (DAS) at the Aviation and Missile Research, Development and Engineering Center (AMRDEC); Communications-Electronics Research, Development and Engineering Center (CERDEC); Tank Automotive Research, Development and Engineering Center (TARDEC); and Natick Soldier RDEC.
- Increase the number of qualified systems engineering, cost estimating, quality assurance and ORSA (military FA 49 and civilian 1515) personnel in Army acquisition.
- Leverage FFRDCs and UARCs to make up for the shortfalls in the Army's systems engineering, quality assurance and analytic capabilities until the bench is replenished.

- Improve quality of program, project and product management by selecting:
 - A GO PM for GCV and similarly complex ACAT I programs.
 - Only PMs and PEOs with expertise and experience in their product lines.
- Improve qualifications of TCMs by:
 - Selecting a colonel level TCM with appropriate operational experience for each key ACAT I program.
 - Requiring attendance at the Capabilities Development Course or its equivalent.
 - Funding with TRADOC mission funding.
- Provide Army Acquisition Corps (AAC) members an opportunity for re-greening through:
 - Full resident participation in AWC and CGSC.
 - Short assignment of potential PMs to staff positions in operational units.
- Increase both AMSAA and TRAC funding by \$10M per year to conduct AoAs.
- Continue to resource the DA program for data collection and development of scenarios, models and simulations to support requirements development in stability and irregular warfare operations.
- Develop needed analytic portfolio management tools for the G-8 and CPRs.
- Fence the funds or fund with a ‘capital’ account six or less key ACAT I programs.
- Focus development and production on what the operational force needs fielded in the next seven years.
- Establish a Center for Army Acquisition Lessons Learned within the Center for Military History.

**The Funds Necessary to Implement This Report’s Recommendations
Are a Small Fraction of the Savings in Lost Sunk Costs**

Implementation of Recommendations

The panel recommends a Secretary of the Army chartered Special Task Force led by the Under Secretary of the Army and the Vice Chief of Staff of the Army be established to plan for and oversee expedited implementation of the recommendations in this report. Key recommendations are included in this Executive Summary; however, they can only be accomplished if the other recommendations in the report are also implemented.

The panel has provided an implementation plan, including all recommendations and suggested individuals or organizations responsible for implementation of each recommendation. The panel will be available to assist the Special Task Force in planning for implementation and is willing to assist the task force leaders in evaluating implementation on a periodic basis.

ACKNOWLEDGMENTS

The panel support team from the Office of the Assistant Secretary of the Army (Acquisition, Logistics, & Technology) includes:

Darry C. Johnson, Colonel, U.S. Army, Executive Officer

John R. Cason, Senior Acquisition Policy Advisor

Hye Sun Miller, Executive Assistant

The panel also received support from the following individuals from the RAND Corporation's Arroyo Center, a not-for-profit Federally Funded Research and Development Center: Bruce Held, Shara Williams, Dan Madden, Duncan Long, 2d Lt Kimberly Hale, Lauren Varga and Jessica Bateman.

I. INTRODUCTION

I.1 CHARTER

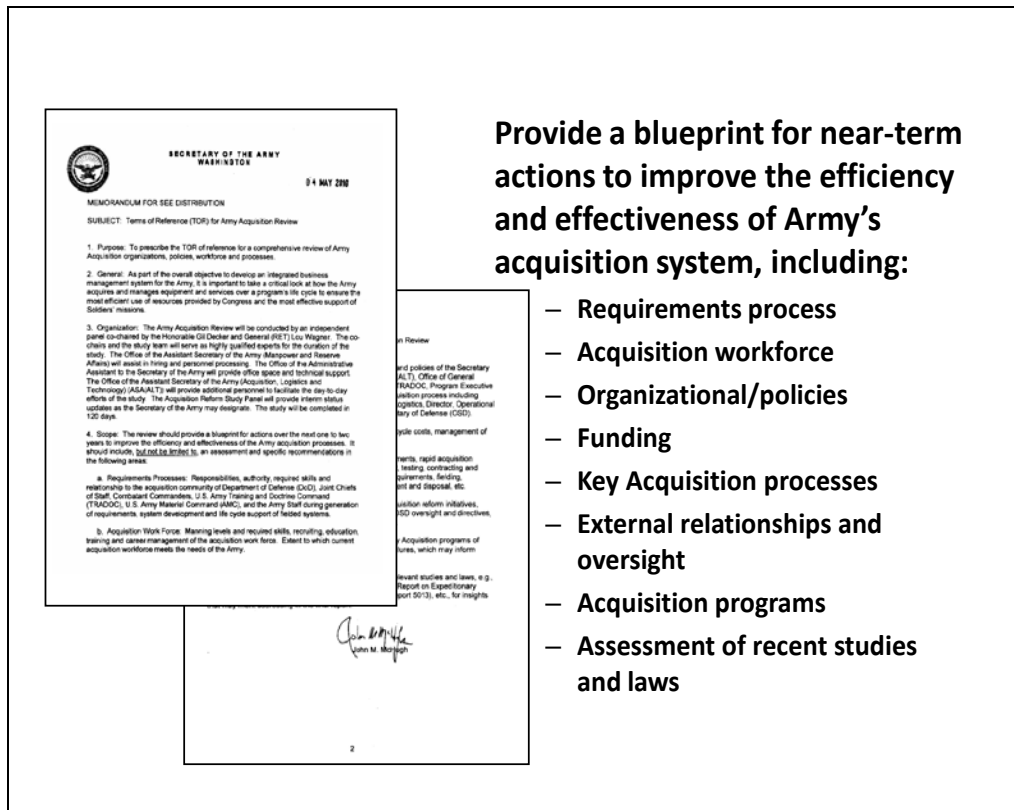


Figure 1. 2010 Army Acquisition Review Charter

In the spring of 2010 the Secretary of the Army, the Honorable John M. McHugh, chartered a study of the Army's acquisition system to be completed by an independent review panel. This study was to address concerns that the Army's acquisition efforts have become less effective and efficient since the end of the Cold War.

The Study Charter stated that the "review should provide a blueprint for actions over the next one to two years to improve the efficiency and effectiveness of the Army acquisition processes." To provide focus on specific areas of concern, the study charter specified a number of areas the panel was to examine more closely.

Because all military acquisitions begin by developing requirements for new materiel, the panel was asked to examine how the responsibility and authority for setting new requirements was assigned. It was also tasked to examine the relationships between the requirements developers and the broader acquisition community, not just in the Army, but in the Department of Defense (DoD) and on the Joint Staff. Importantly, the study charter also asked the panel to evaluate how well the skills and size of the requirements development community matched the tasks assigned to it.

Ultimately, the success of the Army's acquisition workforce will depend on the capabilities of the people who work within it. In light of this, the panel was asked to consider whether the numbers of Army acquisition professionals and their skill levels are appropriate for the responsibilities they bear. A related question posed to the panel is whether Army policy and practice encourages and effectively resources the recruitment of high caliber personnel, both military and civilian, to the Army's acquisition work force, as well as their continued skills improvement through education, training and career management that leads to experience-enhancing assignments.

The foundation of effective Army acquisition efforts is based on the laws, regulations and policies that govern how the Army develops requirements, resources, develops and procures materiel. The study charter also directed an examination of these documents. In many cases the Army is able to adjust regulations and policy to improve their effectiveness, and when that was possible, the panel was directed to recommend opportunities to do so. However, some legal requirements lie beyond the Army's direct influence. In these cases the Army leadership still needs to understand the impact of counterproductive statutes and regulations so that it can begin the process of requesting appropriate modification. Previous acquisition reform initiatives, Congressional and Office of the Secretary of Defense (OSD) oversight, and restrictions that are tied to competition and international implications are just a few such examples the panel was asked to look into.

Furthermore, because the implementation of laws, regulations and policies is expressed in the processes undertaken within the acquisition system, Secretary McHugh also asked the panel to consider and address the key processes that guide the flow of Army acquisition activities.

One key process that enables the research, development and procurement of Army materiel is the determination of the amount of funding required for each effort and the prioritization of funding requests. Because resource determination and allocation are so critical, the panel paid special attention to this particular process.

In addition, the way the Army organizes for acquisition and assigns responsibility and accountability among the various stakeholders is critical to overall organizational effectiveness in carrying out the Army acquisition mission. Therefore, the panel was tasked to examine this aspect of the acquisition system.

Finally, the study charter directed a short review of recent major Army acquisition programs to gain insight into the successes and failures that could provide lessons learned.

I.2 MEMBERSHIP

The Panel members are:

- **Gilbert F. Decker, Co-Chairman**
 - Former Assistant Secretary of the Army (Research, Development and Acquisition) and Army Acquisition Executive, Chair Army Science Board, Vice Chair Board on Army Science & Technology
- **Louis C. Wagner, Jr., Co-Chairman**
 - General, U.S. Army (Ret), former CG U.S. Army Materiel Command, U.S. Army DCSRDA, CG U.S. Army Armor Center
- **William H. Forster**
 - LTG, U.S. Army (Ret), former Military Deputy to the Assistant Secretary of the Army (Research, Development and Acquisition), CG OPTEC and PEO(Aviation)
- **David M. Maddox**
 - General, U.S. Army (Ret), former CINC U.S. Army Europe, CG TRADOC Analysis Command, TRADOC DCS for Combat Developments
- **George T. Singley III**
 - Former Principal Deputy Director Defense Research & Engineering, Deputy Assistant Secretary of the Army (Research & Technology) and PEO(Combat Support Aviation)
- **George G. Williams**
 - Former PEO (Missiles)

The Panel support team includes:

- Darry Johnson, Colonel, U.S. Army, Panel Executive Officer
- John Cason, Acquisition Policy Advisor, ASA(ALT)
- Hye Sun Miller, Executive Assistant

The Panel also received support from the following individuals from the RAND Corporation's Arroyo Center, a Federally Funded Research and Development Center: Bruce Held, Shara Williams, Dan Madden, Duncan Long, and 2d Lt Kimberley Hale

Figure 2. Our Panel Has Six Members

The study charter identified the Honorable Gilbert F. Decker and General (Ret) Louis C. Wagner, Jr., as the co-chairs of the study panel. Mr. Decker and GEN Wagner were selected

based on their deep experience with the Army and its acquisition system. The panel co-chairs identified the other four members of the study panel and Army leadership approved their appointment. Each of the additional members was likewise selected for the depth and breadth of their individual experience in various aspects of the Army acquisition system. The four additional members include:

LTG (Ret) William H. Forster, PhD

GEN (Ret) David M. Maddox

Mr. George T. Singley III

Mr. George G. Williams

Experience among the six panelists includes staff and leadership positions in industry, Defense Department and Army program management, science and technology, staff processes, requirements and combat development, and in operational units.

I.3 REVIEW APPROACH

- **Interviewed over 100 knowledgeable people, including current and/or former:**
 - DEPSECDEF, USD(AT&L), DDR&E and DOT&E
 - Army Chiefs of Staff
 - Under Secretaries and Assistant Secretaries of the Army
 - TRADOC and AMC Commanders
 - PEOs and PMs
 - CEOs of defense companies
- **Reviewed scores of prior acquisition studies, analyses, etc.**
- **Reviewed applicable laws, policies and regulations**
- **Developed findings and recommendations**

Figure 3. How We Approached the Review

The terms of reference for our review called for assessment and recommendations for improvement of the ‘Big A’ acquisition process. The Big A process starts with development of requirements, continues through development, procurement and fielding of systems and products that meet approved requirements, sustainment of fielded systems and products, and ultimate disposition of systems and products that have become obsolete.

Within this broad charter, we emphasized requirements through production and fielding with some review of sustainment.

We also emphasized identification of problems and recommendations for improvement that were within the Army’s purview to implement; however, we did some assessments of external factors, such as statutes, DoD regulations, etc., that were outside the Army purview to amend or change, but might be recommended for modification by the Army.

We used the above framework in our research of data such as:

- Existing laws and regulations
- Case studies of previous and current Army acquisition programs
- Previous studies on acquisition reform and improvement

A complete list of sources can be found in References.

I.4 INTERVIEWS

In our interviews of more than 100 experienced personnel, we prepared questions and issues and distributed them in advance to each person interviewed (see Figure 4). We used the same study framework in our interviews as we did in the data research.

We extend our appreciation to each person interviewed for their cooperation and candor.

Althouse, James, Colonel, U.S. Army, Military

Deputy, Edgewood Chemical Biological Center

Augustine, Norm, former Chairman and CEO of

Lockheed Martin Corporation

Bagwell, Thomas, Deputy Program Executive

Officer (PEO), Combat Support and Combat

Service Support

Barrie, Rob, Lieutenant Colonel, U.S. Army,

Product Manager (PM), Joint Air Ground Missile

Bartley, John, Major General, U.S. Army, Program

Executive Officer, Integration

Bauman, Michael, Director, Analysis Center, U.S.

Army Training and Doctrine Command

(TRADOC)

Beavers, Phil, Army Materiel Systems Analysis

Activity (AMSAA)

Benson, William, Colonel, U.S. Army, AMSAA

Bochenek, Grace, Dr., Director, U.S. Army Tank

Automotive Research, Development and

Engineering Center (TARDEC)

Bogosian, Paul, former PEO Aviation, U. S. Army

Aviation and Missile Research, Development and

Engineering Center (AMRDEC)

Bolger, Daniel, Lieutenant General, U.S. Army,

Deputy Chief of Staff, G-3/5/7

Brown, Brad, Director for Acquisition and Program

Management, Defense Acquisition University

(DAU)

Brown, Kirby, Deputy to the Commanding General

and Director of Capabilities Development &

Integration Directorate, Fires Center of

Excellence (CoE)

Brown, Robert, Brigadier General, U.S. Army,

Deputy for Acquisition & Systems Management

Carroll, Kevin, Interoperability Clearing House,

Chair, IT-Acquisition Advisory Council

Carter, Ashton, Honorable, Under Secretary of

Defense for Acquisition, Logistics and

Technology, and Defense Acquisition Executive

(DAE)

Casey, George, General, U.S. Army, Chief of Staff

of the Army

Chiarelli, Peter, General, Vice Chief of Staff of the

Army

Crain, William, Dr., AMSAA

Crosby, William, Brigadier General, U.S. Army,

PEO Aviation

Crutchfield, Anthony, Brigadier General, U.S.

Army, Aviation CoE

Davis, Scott, PEO, Ground Combat Systems

Dellarocco, Genaro, Major General, U.S. Army,

PEO, Missiles and Space

Dempsey, Martin, General, U.S. Army,

Commanding General, TRADOC

Drezner, Jeff, Dr., RAND Corporation

Dunwoody, Ann, General, U.S. Army,

Commanding General, Army Materiel Command

Edwards, Eric, Technical Director for U.S. Army

Aviation and Missile Research, Development and

Engineering Center

Edwards, Terry, Director, System of Systems & Systems Engineering, Office of the Assistant Secretary of the Army (Acquisition, Logistics and Technology) (ASA(ALT))

Fontaine, Yves, Major General, U.S. Army, Commanding General, U.S. Army Sustainment Command

Ford, Nelson, former Under Secretary of the Army, current President and CEO, Logistics Management Institute (LMI)

Foss, John, General (Retired), former Commanding General, TRADOC

Freeman, Marilyn, Dr., Deputy Assistant Secretary of the Army for Research and Technology

Fuller, Peter, Brigadier General (P), U.S. Army, PEO Soldier

Gansler, Jacque, former Under Secretary of Defense for Acquisition, Technology and Logistics

Gates, Susan, Dr., RAND Corporation
Generating Force Analysis Task Force

Gilmore, James, Dr., Director, Operational Test & Evaluation, Office of Secretary of Defense (OSD)

Giuliano, Lou, former Chairman and CEO, ITT Industries

Gonzales, Gregory, Colonel, U.S. Army, PM Unmanned Aerial Systems

Halverson, David, Major General, U.S. Army, Commanding General, Fires CoE

Hamre, John, Dr., former Deputy Secretary of Defense, current CEO of Center for Strategic and International Studies

Harrington, Edward, Deputy Assistant Secretary of the Army for Procurement

Harris, George, Major General, U.S. Army, Assistant to the Principal Military Deputy, ASA(ALT)

Hartzog, William, General (Retired), U.S. Army, President and CEO of Burdeshaw Associates

Held, Bruce, Dr., RAND Corporation

Hite, Ronald, Lieutenant General (Retired), U.S. Army, Emeritus Senior Advisor to Cypress International

Hogan, William, China Lake High Tech Consortium

Jefferson, Joseph, OASA(ALT)

Jette, Bruce, Colonel (Retired), U.S. Army, President and CEO of Synovision Solutions LLC

Justice, Nick, Major General, U.S. Army, Commanding General of Research, Development and Engineering Command (RDECOM)

Kaminski, Paul, Dr., former Under Secretary of Defense for Acquisition and Technology

Kendall, Frank, Honorable, Principal Deputy USD(AT&L)

Kern, Paul, General (Retired), U.S. Army, former Commanding General, Army Materiel Command (AMC), current Senior Counselor with The Cohen Group

Knudson, Ole, Colonel (P), U.S. Army, PEO, Missiles and Space

Kreider, Steven, Deputy PEO, Integration

Laux, Thomas, Deputy Assistant Secretary of the Navy – Air

Lawrence, Susan, Major General, U.S. Army, Commanding General, Army Network Enterprise Technology Command

Lemnios, Zachary J, Honorable, Director, Defense Research and Engineering, Office of the Secretary of Defense

Lennox, Robert, Lieutenant General, Deputy Chief of Staff, G-8

Linton, David, Co-Chief Operating Officer and President of Curtiss-Wright Flow Control Corporation

Love, Steve, OASA(ALT)

Lyons, Jayne, AMSAA

Martz, Joseph, Major General, U.S. Army, Director, Program Analysis and Evaluation, G-8

McCullough, Jim, Dr., Director of Defense Acquisition University-South

Melita, Tony, Melita Consulting

Mullins, Tom, Deputy Assistant Secretary of the Army, Plans, Programs, & Resources

Myles, James, Major General, U.S. Army,
Commanding General, Aviation and Missile
Command

Nance, William, Major General (Retired), U.S.
Army, President, Cypress International

Norsworthy, Levator, Acting Principal Deputy
General Counsel and Deputy General Counsel –
Acquisition, Office of the Army General Counsel

Oates, Michael, Lieutenant General, U.S. Army,
Director, Joint IED Defeat Organization

O'Neill, Malcolm, Honorable, Assistant Secretary
of the Army, Acquisition, Logistics and
Technology, and Army Acquisition Executive

O'Neil, Scott, Executive Director, Director for
Research and Engineering, Naval Air Warfare
Center Weapons Division

O'Reilly, Patrick, Lieutenant General, U.S. Army,
Director of Missile Defense Agency

Owings, Tim, Deputy Project Manager, Unmanned
Aircraft Systems

Phillips, William, Lieutenant General, U.S. Army,
Military Deputy to the ASA(ALT)

Pike, Barry, Chief of Staff, PEO Missiles and Space

Pillsbury, James, Lieutenant General, U.S. Army,
Deputy Commander, AMC

Pinson, Tracy, Director, Office of Small and
Disadvantaged Business Utilization, Department
of the Army

Price, Lee, Brigadier General, U.S. Army, PEO,
Command Control Communications-Tactical
(C3T)

Punaro, Arnold, Senior Member, Defense Business
Board

Pybus, Wimpy, Deputy Assistant Secretary of the
Army, Acquisition Policy and Logistics

Rabaut, Thomas, Senior Advisor, Carlyle Group

Raps, Susan, Deputy General Counsel for
Acquisition, OSD

Reynolds, Scott, Professor, DAU

Richardson, William, General (Retired) U.S. Army
Former Commander, TRADOC

Sando, Donald, Director for the Capabilities
Development and Integration Directorate,
Maneuver CoE

Schenk, Donald, Brigadier General (Retired), U.S.
Army, former Program Manager, Unit of Action,
PEO Ground Combat Systems

Shaffer, Al, Principal Deputy, Director, Defense
Research and Engineering

Smith, Roger, former Deputy Assistant Secretary of
the Navy, current President, RMax Technologies,
LLC

Snider, Jim, Dr. Associate Director for Aviation,
U.S. Army Aviation and Missile Research,
Development and Engineering Center

Solesbee, Carol, Colonel, U.S. Army, Assistant
Deputy for Operations, ASA(ALT)-SR

Sorenson, Jeffrey, Lieutenant General, U.S. Army,
Chief Information Officer, G-6

Spisak, Craig, Director of Acquisition Support
Center

Spoehr, Thomas, Major General, U.S. Army,
Director, Force Development, G-8

Spruill, Nancy, Dr., Director, Acquisition
Resources and Analysis, OSD ATL

Stein, Kurt, Major General, U.S. Army,
Commanding General, TACOM Life Cycle
Management Command

Streilein, James, Executive Director, U.S. Army
Test and Evaluation Command

Stevens, Rob, Nameplate Engineer, Ford Motor
Company

Stevenson, Mitchell, Lieutenant General, U.S.
Army, Deputy Chief of Staff, G-4

Strong, Randolph, Major General, U.S. Army,
Commanding General, Communications and
Electronics Command (CECOM)

Stroup, Ted, Lieutenant General (Retired), U.S.
Army, former Deputy Chief of Staff for
Personnel, current Executive Director of
Association of the United States Army (AUSA)'s
Institute of Land Warfare

Sullivan, Gordon, General (Retired), U.S. Army,
former Chief of Staff of the Army, current
President of AUSA

Thomas, Edward, Deputy Commander, CECOM
Thurman, Lawrence, OASA(ALT)

Tilelli, John, General (Retired), U.S. Army, former
Vice Chief of Staff for the Army, current CEO of
Cypress International

Vandiver, Edgar, Dr., Director, Center for Army
Analysis (CAA), G-8

Vane, Michael, Lieutenant General, U.S. Army,
Director, Army Capabilities Integration Center,
TRADOC

Vuono, Carl, General (Retired), U.S. Army, former
Chief of Staff of the Army

Walker, Karen, Executive Program Support
Analyst, ASA(ALT)

Westphal, Joseph, Honorable, Under Secretary of
the Army

Wiltsie, Douglas, Deputy PEO Intelligence,
Electronic Warfare and Sensors (IEW&S)

Figure 4. Interviewees

• <i>"We need an agile system that rapidly develops, purchases, and fields innovative solutions for our soldiers. . . ." – Army Secretary John McHugh</i> • <i>"Acquisition process is 'workman-like'...it does the job, but poorly." – Former Assistant Secretary of the Army</i> • <i>"The JCIDS process was a good faith effort. We cannot afford that long of a process in this era." – LTG(USAF)</i> • <i>"Too many people can say no." – Former DUSD</i> • <i>"In business, at the end of the day, speed is what matters." – Former CEO</i> • <i>The Life Cycle Management Commands have become 'Balkanized'!" – LCMC CG</i> • <i>"Fiscally constrain DOTE...make them pay for testing or restrain their ability to select any item for test." – SES PEO</i> • <i>"Contractor DASCs are truly weak...Get the DASCs back into the building!" – GO PEO</i>	• <i>"We need to enhance the role and reputation of TCMs." – CG TRADOC CoE CDID</i> • <i>"Schedule should be the first priority when responding to the immediate needs of soldiers in combat." – LTG(USA)</i> • <i>"The Acquisition Corps has really hurt the Army...it separated Acquisition from the rest of the Army." – Retired former CG TRADOC</i> • <i>"RDECOM is a failed experiment." – LTG(USA)</i> • <i>"The Analysis process is broken." – Former VCSA</i> • <i>"We are rapidly equipping the current fight. The problem is that the current deliberate acquisition process won't get us the 3-7 year solution." – OSD Principal</i> • <i>"We have not learned any new ways to go wrong." – Former CEO</i>
--	--

Figure 5. Some Quotes from Interviews

The panel spent hundreds of hours interviewing senior and midlevel professionals and experts, military and civilian, active and retired, operating and generating force, customers and suppliers. The panel is grateful to all those interviewed for their time, insight, and service. Probably none of those interviewed would agree with the entire suite of this panel's findings and recommendations, but there is a broad consensus about the scope and sources of the problems facing the Army's acquisition community.

The above quotes are snapshots of common themes and concerns among those interviewed. They reflect frustration with the lack of responsiveness of the acquisition system to current threats, pace of modernization, perceived divisions between the operating and generating force, and the challenge of streamlining an intractably bureaucratic system.

I.5 MAJOR PROBLEMS

- **The Army has increasingly failed to take new development programs of record into full rate production:**
 - From 1990 to 2010, the Army has terminated 22 Major Defense Acquisition Programs (MDAP) of record before completion
 - 7 terminated (1990-2000)
 - 15 terminated (2001-2010)
 - Terminations equal about 35-45% of Army DT&E TOA from FY2004-09
- **“Defense acquisition revolves around 15-year programs, 5-year plans, 3-year management, 2-year Congresses, 18-month technologies, 1-year budgets and thousands of pages of regulations” (BENS Report)**
- **Accountability and authority is widely diffused in increasingly complex decision structures and processes (QDR Independent Panel Report)**
- **CBO forecasts that servicing the interest on the Federal debt will equal the DoD budget by 2018:**
 - Looming Defense budget reductions necessitate lower, more effective and efficient expenditures for Army acquisition, logistics and technology
 - Army must get more capability from a declining Defense budget

Figure 6. Major Problems Hamper Acquisition

In reviewing the information and data from all sources, we concluded that there are four ‘big picture’ problems in Army acquisition. Three are past and current problems; the fourth is a future problem that will be largely driven by the nation’s fiscal issues.

These four problem areas cannot be cured by generalized, broad recommendations. Rather, they must be cured by addressing in detail the specific problems and recommendations at every stage of the acquisition process.

If the Army implements the recommendations of our report, it will greatly reduce terminations, delays and cost overruns of future programs, and improve the efficiency of requirements development, resourcing and acquisition.

During our review of the available data on terminated major programs of record, there were varying reasons stated for termination, often conflicting. However, during our interviews and review of available reports from Army records, OSD files, and congressional reports, there was general agreement that, whatever the reason, the rate of cancellation indicates flaws in budgetary forecasting, requirements determination, cost estimation and program execution.

Why is there such enduring dissatisfaction with DoD acquisition by leaders, workforce, customers and taxpayers? Succinctly, there are too many failed programs, the cost of equipping our military continues to rise and it takes too long to acquire the right equipment.

During Operation Iraqi Freedom, former Secretary of Defense Donald Rumsfeld, addressing the Tennessee National Guard preparing to go into Iraq without up-armored HMMWVs, said “You go to war with the Army you have. They're not the Army you might want or wish to have at a later time” (Ref 136). A recent BENS report, entitled *Getting to Best: Reforming the Defense Acquisition Enterprise* and chaired by Norm Augustine (Ref 264), observed, “The acquisition process is actually not a unified process: It better resembles a collection of band-aids layered over each other, each designed in its time to solve some specific problem, none undertaken in consideration of its eventual impact on the acquisition function as a whole. Defense acquisition revolves around:

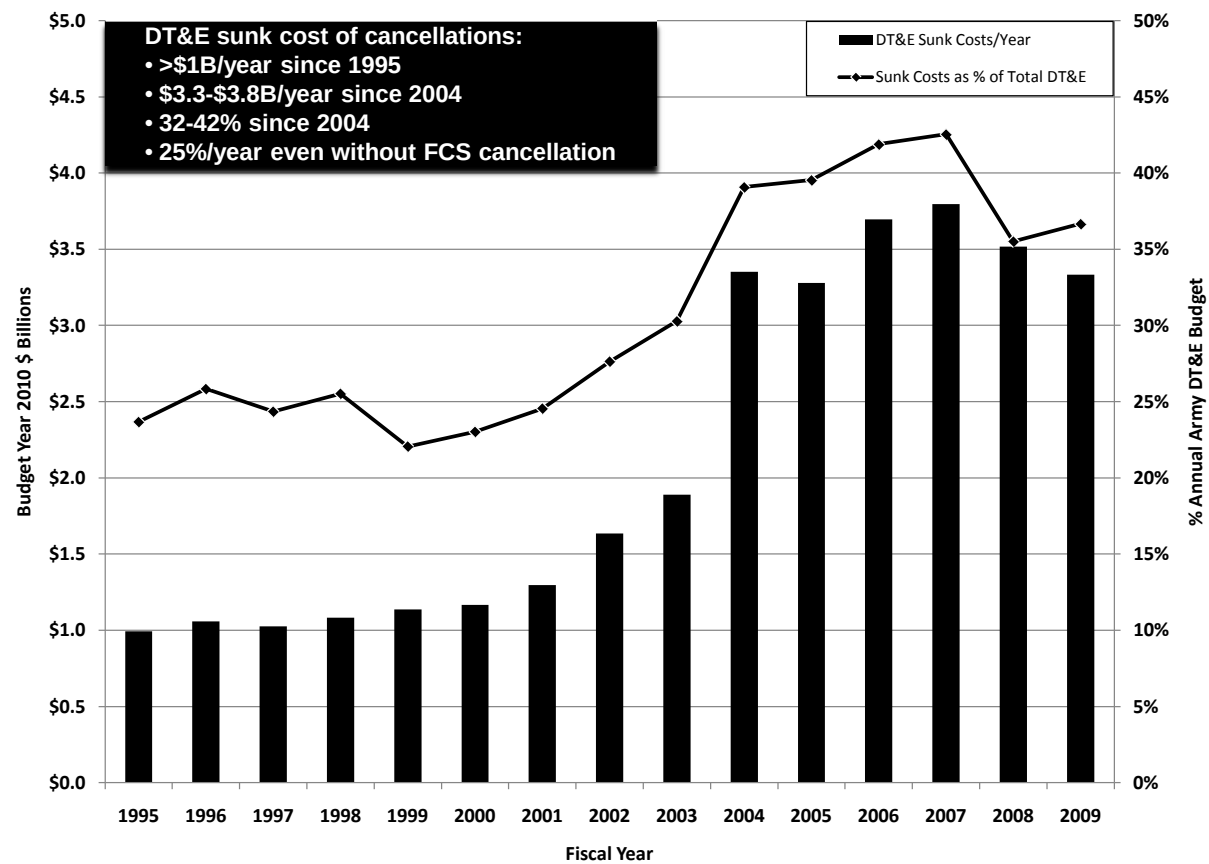
- 15-year programs,
- 5-year plans,
- 3-year management,
- 2-year Congresses,
- 18-month technologies,
- 1-year budgets, and
- thousands of pages of regulations.”

A key finding of the Quadrennial Defense Review (QDR) 2010 Independent Panel Report was that the Defense Department has been in a near constant state of reform since Goldwater-Nichols, but has produced more and more process and less and less line management accountability and authority (Refs 88 and 231).

It is forecast that by 2018, servicing the national debt will exceed the base defense budget (Ref 60). The rising deficit, rising entitlements and the end of supplemental budgets as we

withdraw from Iraq and Afghanistan are likely to result in draconian cuts in the discretionary federal budget, half of which is the defense budget. The U.S. Army should prepare for the possibility of major reductions in the defense budget over the next Program Objective Memorandum (POM) period. If the past is any prologue, Army research, development and acquisition (RDA) budgets will be reduced as force structure, training and quality of life are given higher priority. This will be compounded by the Quadrennial Defense Review (QDR) and independent QDR recommendations.

If the Army can implement the detailed recommendations of our report, particularly those related to streamlining line management accountability and authority, it will significantly mitigate these 'big picture' problems.



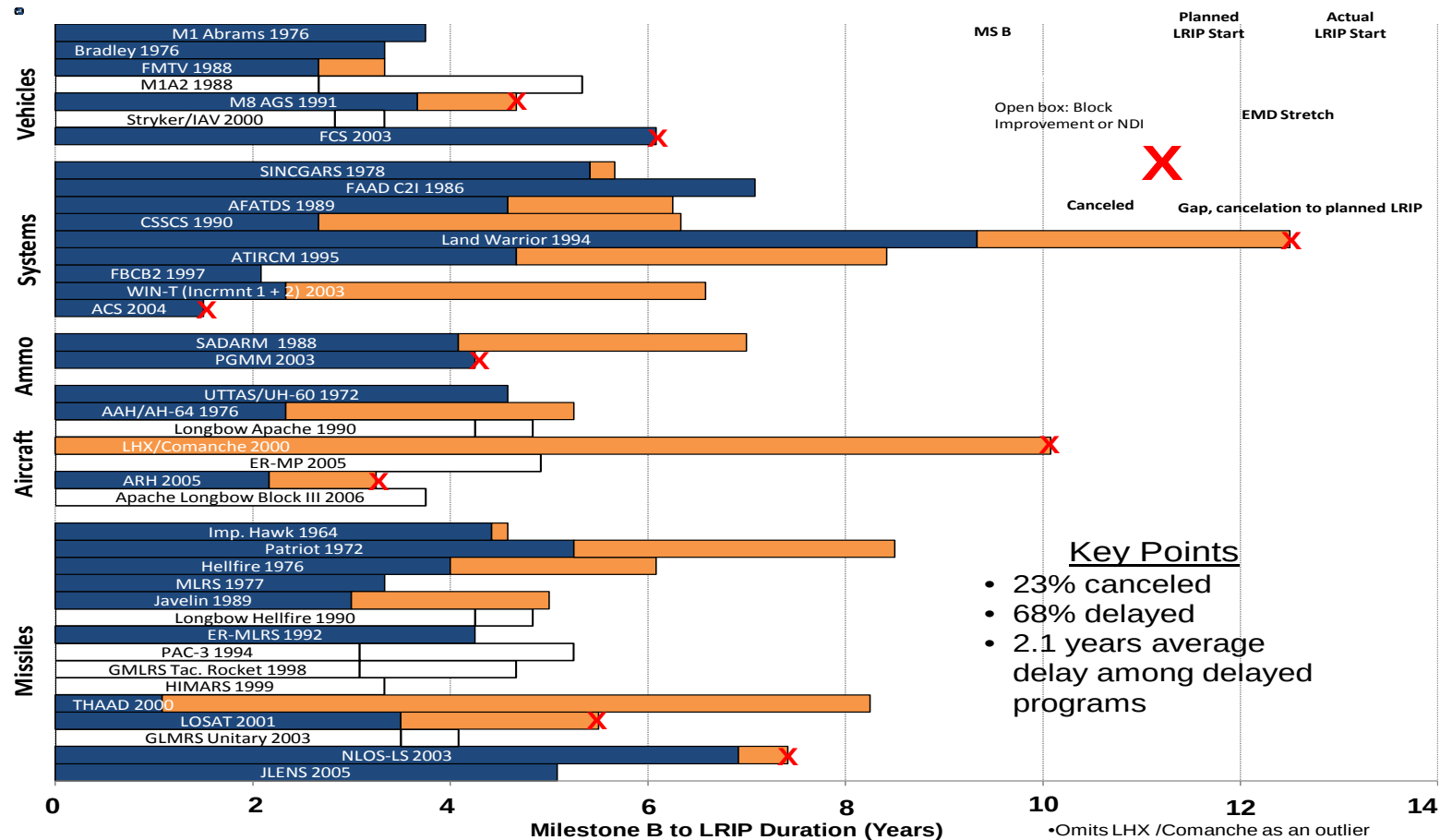
Source: OASA(ALT) WARBUCS
 Note: DT&E = RDT&E – S&T

Figure 7. Army DT&E Funding Lost on Cancelled Programs

Figure 7 shows the annual Army Development Testing & Evaluation (DT&E) funding (i.e., RDT&E minus S&T (6.1, 6.2 and 6.3) funding) for which there was no product produced as a result of the 22 ACAT I program terminations listed in Appendix B.1. All amounts are listed in Army Budget Year 2010 dollars. The vertical scale on the right shows the 'sunk cost' as a percentage of total Army DT&E funding for a given year and the scale on the left shows the actual funding in constant FY2010 dollars. This sunk cost is also an 'opportunity cost' since this funding was spent, never led to a fielded product and could have otherwise been invested in another successful program.

Owing to its sheer size, the now terminated Future Combat System (FCS) program can overshadow debates about challenges in the Army acquisition system; however, it is important to note that the Army's challenges predate FCS. Excluding the funding spent on FCS, the sunk costs have been approximately 25% per year. Every year since 1996, the Army has spent more than \$1 billion annually on programs that were ultimately cancelled. Since 2004, with FCS, \$3.3B to \$3.8B per year, or 35% to 45% per year, of Army DT&E funding has gone to cancelled programs.

We found the Army's documented reasons for cancellation to be too general and in conflict with the facts as we know them based on personal experience with many of the 22 programs and discussions with others in the Army who had worked on the programs. There are typically multiple causes for each program cancellation, and for each program conflicting explanations. Although there are many different causes that contribute to the cancellation of a program, the cancelled programs often shared several of the same problems. A few were cancelled because the threat disappeared. Yet the reason most often cited for program cancellation was tersely described as a 'change in priorities' or 'affordability'. The root causes for termination are discussed later in this report. But whatever the reason, the track record of too many cancellations, schedule slippages, cost overruns and failure to deliver timely solutions to warfighter needs is unacceptable. The Army cannot afford to acquire materiel the way it has in the last two decades.



Refs 179-211

Figure 8. 40 Army ACAT I Schedule Histories Show Program Schedule Slippage is a Problem

In addition to billions of development dollars lost due to program cancellations, too many major programs have experienced cost increases due to schedule slippage during development. Forty Acquisition Category (ACAT) I major programs were analyzed in September 2010, revealing 23% cancelled and 68% delayed. In Figure 8 above, the ACAT I programs are identified on the bar along with the year they started Engineering and Manufacturing Development (EMD). The solid blue bar indicates the original scheduled development time (from Milestone B to low rate initial production) as planned when the program was at Milestone B (MS B). The orange bar indicates the additional development time due to slippage. The blue bar plus the orange bar equals the actual length of EMD duration in years. A red X marks how many years after MS B the program was cancelled. Note that Figure 8 is not able to represent when a program reached low rate initial production (LRIP) *before* the planned date; this is the case for a small number of programs: the Extended Range Multiple Launch Rocket System (ER MLRS), Utility Tactical Transport Aircraft System (UTTAS), Forward Area Air Defense Command, Control and Intelligence (FAAD C2I), and M1 Abrams. Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS) has not yet reached LRIP. Its planned LRIP start was September 2010. Aerial Common Sensor (ACS) and FCS are omitted from the 2.1-year delay average because they were canceled before they reached Milestone C (MS C). Excluding the LHX/Comanche, the average delay across all programs, whether delayed or not, was 1.3 years. With LHX/Comanche included, the average delay was 2.4 years.

Figure 9 was produced by the Defense Acquisition University to describe the DoD acquisition process (Ref 124). On the reverse side of this chart *are eight pages of amplifying text in small font*. Following this process provides no guarantee that a new capability will be fielded to our soldiers and certainly not in a timely, responsive manner. In fact, even if one were to produce nothing, following the processes and reporting prescribed by this chart amounts to four years of planning, review and reporting effort.

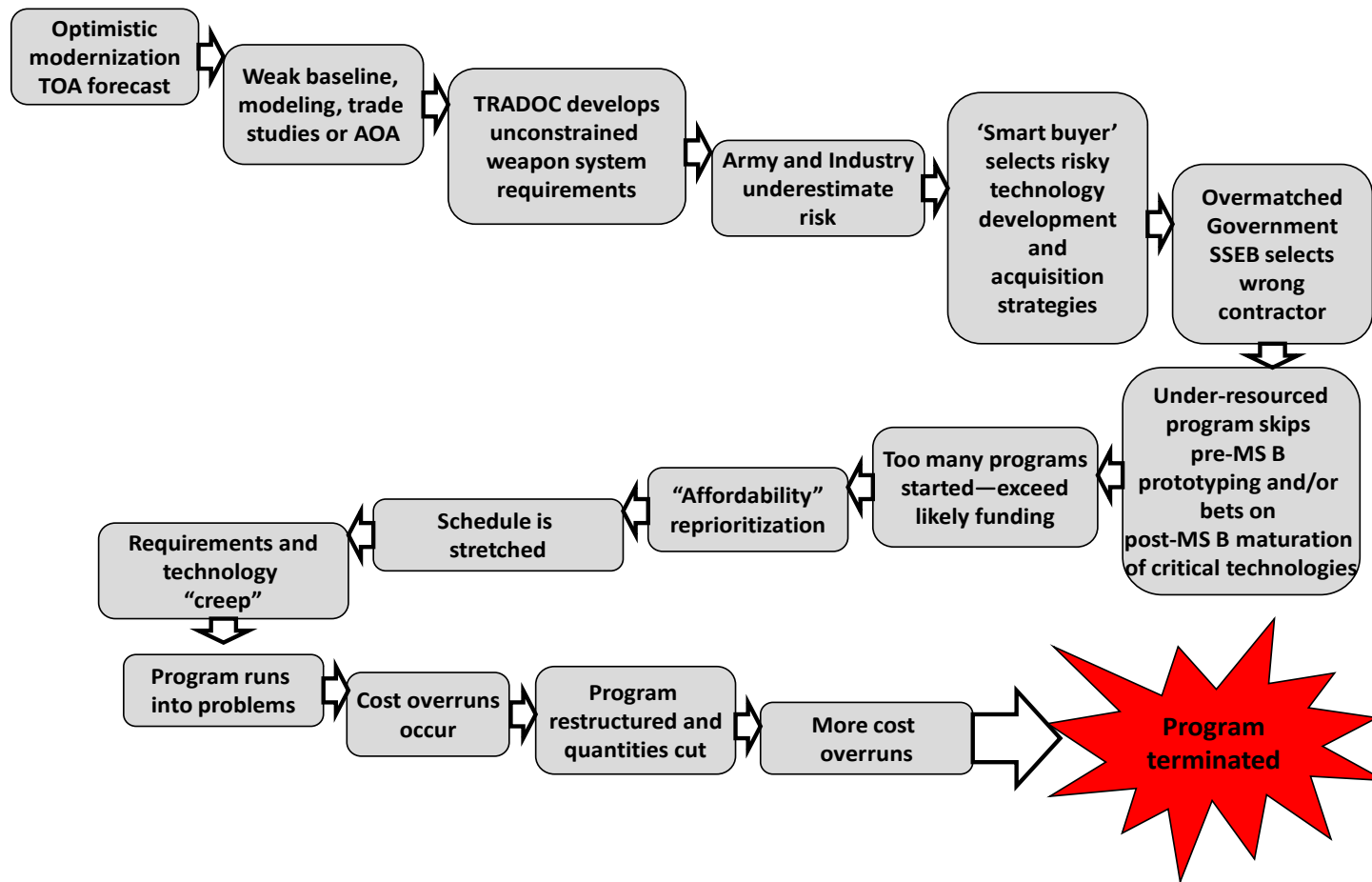


Figure 10. Too Often the Army Finds Itself in an 'Acquisition Death Spiral'

The path to program termination touches many of the stations on the 'Acquisition Death Spiral' illustrated in Figure 10:

- Army leadership and 'programmers' tend to optimistically assume that funding will get better in the longer term, but as the POM years become the budget and execution years, the Army receives less Total Obligational Authority (TOA) than forecasted and planned.
- The requirements analysis, modeling, trade studies and Analysis of Alternatives (AoA) for POM programs is weaker than needed due to many factors which will be discussed later in this study.
- Training and Doctrine Command (TRADOC) requirements are developed based on what the warfighter says he needs or even wants, without enough consideration of the real technical risk, likely available funding, sustainment burden and life cycle cost.
- In an environment where Congress and the Pentagon demand major improvements or innovations, compared to what can be provided by current or upgraded systems, the Army and industry overestimate benefits and/or underestimate overall program risk in order to justify a new system development.
- Due in part to a weakened 'smart buyer' capability in the Army RDA community, including Program Executive Officer (PEO) and Program Manager (PM) Offices, and to pressures to hold down development costs to fit within lower funding levels at the beginning of the budget and POM years; technology development, EMD and acquisition budgets and strategies fail or are inadequate to manage risk.
- Because, in part, there are fewer new development programs, there are fewer opportunities for Army 'smart buyers' to gain valuable Source Selection Evaluation Board (SSEB) experience. This, coupled with the 'brain drain' of experienced evaluators and compounded by Base Realignment and Closure (BRAC) actions, results in government evaluators, cost estimators, business managers and negotiators being overmatched by their industry counterparts and bidders.
- Because it takes so long to get to MS A, there is pressure to get the product to the warfighter soon and conflicting pressure to hold down front-end development costs in the early years of the POM. Consequently, the Army underfunds or eliminates Integrated Product and Process Development (IPPD), Six Sigma, systems integration labs and prototyping necessary to demonstrate and validate technology and systems risks are under control prior to entering EMD. Too often, technologies required to

provide the advertised major improvements, but not proven mature by MS B, are carried over to EMD with the expectation that they can be sufficiently matured in EMD.

- Because the cost of POM'd programs and the Army POM TOA are underestimated, more programs are started than can be afforded.
- As the POM out-years become the near-term years and the true EMD costs become known, 'affordability' concerns cause priorities to change and some programs get restructured, stretched or cancelled before the program EMD 'bow wave' is reached.
- When programs get restructured and schedules stretch, costs grow.
- Restructuring opens the program baseline to additional technological and requirement 'good ideas' that did not make it into the original baseline.
- Due to funding instability and improper risk management, as described above, the program runs into more technical and/or cost difficulty.
- Cost overruns surface.
- A program may get restructured, again repeating many of the aforementioned steps, but the development program may now have been going so long that the requirement is no longer valid or of sufficiently high priority to be justified.
- Any combination of the above can lead to program termination.

In the past fifty years there have been hundreds of well intended studies of the defense acquisition system by respected, accomplished experts, including the studies of Figure 11. There is remarkable consensus on what improvements are needed as reflected in Figure 11.

“We all know what needs to be done. The question is why aren’t we doing it?” David Packard		Packard Commission DEPSECDEF's DAPA BENS: Getting to Best Gansler Commission AMSAA Study Reno Study CNA AF Acquisition WSARA & HASC Panel							
Recommendations									
Acquisition System (Big A)									
Senior uniformed leadership needs to play a greater role in the definition and development of critical programs (e.g., VCSA's CPRs, VCSA as ASARC co-chair).					X		X	X	X
Establish close collaboration between acquisition, requirements and resource communities, and processes, beginning with ICD development and throughout the system's lifecycle. Integrate these three decision processes to the extent possible.		X	X	X	X	X	X	X	X
Requirements									
Conduct a thorough analysis of requirements at the front-end of the acquisition process, making tradeoffs early. Control requirements creep and optimistic estimates of technical feasibility.		X	X	X			X	X	X
Make schedule a critical factor (KPP) in requirement tradeoff considerations.		X	X	X				X	X
Use operational testing to understand capabilities and limits of programs, not to deliver pass/fail verdicts (e.g., use validated data from the development phase; establish an "operationally acceptable" category of T&E).		X	X	X					X
Acquisition Management									
Increase the number, quality and experience of systems engineers, cost analysts, ORSAs, and contracting officers using flexible personnel management authorities (e.g., Army Lab Demo program).		X	X	X	X			X	X
Key Leadership Personnel turbulence should be minimized (e.g., PMs should remain with a program from milestone B to C).			X	X					
Don't enter system development (past MS B) with immature technologies (e.g., below TRL 7). Defer immature technology to future blocks and prototype system and subsystems.		X	X	X					X
Use competition to the maximum extent possible throughout a system's lifecycle, both at the system and subsystem levels (e.g., buy the TDP).		X	X	X		X			X
Resources									
Stabilize funding to maximum extent practical (e.g., management contingency fund, high-confidence cost estimates, multiyear procurements).		X	X	X				X	X
References		43	66	264	58	279	238	97	266,122

Figure 11. Many Studies Make Similar Recommendations

It has been said “If Sisyphus had a job in the Pentagon, it would be acquisition reform” (Ref 164). Figure 11 illustrates the point. Studies ranging from the Packard Commission, written during the Cold War, to contemporary congressional reports largely agree on what is required to improve the acquisition system. David Packard’s question remains relevant, “Why aren’t we doing it?”

Blanks in Figure 11 indicate that the associated report did not address a particular recommendation, not that the study disagreed with the recommendation. WSARA (Ref 226) and the HASC Defense Acquisition Reform Panel Report (IMPROVE) (Ref 122) are treated together as representative of Congressional views.

- ***Big A Acquisition.*** It has long been recognized that requirements, acquisition and resource processes must be closely integrated to deliver the right systems, at the right time, at the right price to soldiers. The Goldwater-Nichols Act sought to streamline the acquisition system by reducing the number of management layers separating program managers from the civilian acquisition executives, and removing the Services’ uniformed leaders from the acquisition chain of command (Ref 228). Many recent studies, including congressional reports, have expressed a concern that the Services have gone too far in removing uniformed military leaders from the acquisition decision process (Ref 226). The resulting divide has disrupted the frank and timely evaluation of what the warfighter needs, and what is technically and fiscally realistic. Of particular note is that every study in Figure 11 stressed collaboration in acquisition between the civilian leadership and the military leadership. Successful acquisition management is contingent on stable, realistic budgets and capability requirements. Many of the studies surveyed recommended additional focus and involvement of senior military leadership to ensure that the Army’s investments are aligned with the Army’s priorities. The Army’s Capability Portfolio Reviews are an excellent step in this direction.
- ***Requirements.*** Most program cost and performance characteristics are locked in prior to Milestone A, when performance, schedule and cost trade space is largest and cheapest. Most previous reports reviewed underline the importance of quality, broadly scoped Analyses of Alternatives to support Army leadership decision making. Leaders need to carefully guard against the cumulative effect of incremental requirement increases (‘requirements creep’).

In a 21st century security environment characterized by asymmetric threats at multiple points along the spectrum of conflict, program schedule has taken on new significance. Cycle time between the fielding of new capabilities and the enemy's deployment of a counter has decreased dramatically. Yet even during the Cold War, time was an enemy, and the Packard Commission asserted that dramatic decreases in development schedules were achievable if Army leadership made schedule a priority on a par with performance.

'Fly before you buy' is a sound acquisition principle, but many of the studies reviewed cautioned against the Department of Defense Test & Evaluation community grading on purely 'pass/fail' criteria, where a pass requires 100% of all Key Performance Parameters (KPP) and Key System Attributes (KSA) be satisfied. This can lead to more expensive than necessary Army testing, retests or program terminations and restarts to fix the shortfalls. The "pass/fail" criteria contradict DoD Instruction (DoDI) 5000.02, which encourages incremental improvements, and recent Secretary of Defense guidance, which encourages a '75%' solution (Ref 109).

- ***Acquisition Management.*** The acquisition workforce has consistently been a source of concern among acquisition experts and in Congress. Systems engineers, cost analysts, Operations Research and Systems Analysts (ORSA) and contracting officers are often highlighted in the reviewed studies as elements of the acquisition and requirements workforce requiring special focus. The Army Laboratory Demonstration Program (Ref 10) has many of the authorities vital to effective workforce management:
 - Pay flexibility (bands) for new employees
 - Ability to promote between pay bands without public competition
 - A technical career track alternative to management
 - Greater flexibility in firing non-performers

Having developed the right workforce and leadership, leadership stability is frequently cited as an important characteristic of successful programs to ensure accountability and that the government has knowledge of programs comparable to its industry partners.

The reports reviewed and the acquisition literature in general is littered with admonitions against entering the EMD phase with immature technologies. Recent studies frequently highlight the need to understand system integration and manufacturing risk, in addition to technology risk.

Though many of the defense industry's characteristics make competition difficult, most previous reports strongly encourage DoD to sustain competition to the maximum extent possible. Competition costs money at the front end, but in the long run can save the government money and improve contractor performance. Most experts agree that competition throughout a program's life cycle requires careful front-end planning to ensure that the government has access to the Technical Data Packages (TDP) necessary to compete a program at a reasonable price. Program characteristics typically requiring consideration include economies of scale, structure of Operations & Support (O&S) costs, and steepness of the contractor's learning curve.

- ***Resources.*** As noted above, most of the reports reviewed highlight the importance of funding stability to a successful and efficiently run program. Program instability can lead to loss of critical personnel during the development process, or inefficient contracting vehicles in production, among other problems.

There is downside risk associated with each of the solutions proposed in acquisition literature and challenges associated with securing congressional support, but there is a general consensus that important opportunities have been missed. In a recent report the House Armed Services Committee noted that DoD had interpreted congressional guidance concerning multiyear procurements in too conservative a manner, and was missing opportunities to save taxpayers significant dollars (Ref 122).

II. FINDINGS

- **Requirements Development is Broken**
- **Risk Management is Deficient**
- **Big 'A' is Not Aligned**
- **Requirements and Acquisition Resources Are Inadequate**

Figure 12. Our Findings Fall into Four Categories

Consistent with the terms of reference within our charter, we gathered information from our data resources and from our interviews. As we began to analyze the information to develop findings, we found that our myriad of findings fell into four broad categories. These four categories provide the taxonomy for our detailed findings and recommendations and provide a consistent cross reference between findings and recommendations.

II.1 REQUIREMENTS DEVELOPMENT IS BROKEN

- Many still believe that Army requirements should be unconstrained by technology and funding
- The difference between Key Performance Parameters (KPPs) and Key System Attributes (KSAs) is often misunderstood
- The Army acquisition community is too often perceived as ‘shoppers’ of materiel rather than as participants in the development of technically and fiscally feasible requirements
- A deliberate, rigorous, yet tailorable process, involving collaboration among the requirements/operational, cost/benefits analysis, technology, systems engineering, testing, project management, sustainment and contracting communities does not exist and too often, this has been attempted in an uncoordinated, serial approach
- While AR71-9 calls for Integrated Capabilities Development Teams (ICDT) chaired by TRADOC to develop requirements, TRADOC can only “invite” participation by the Secretariat, ARSTAFF and other Army commands
- G-3/5/7 and G-8 practice an oversight role to the exclusion of a team participation role
- For ACAT 1 programs between MDD and MS B, Special Task Forces (STF), like the Second Generation FLIR STF, have been successful

Figure 13. Requirements Development Not Constrained or Collaborative

As personnel were interviewed, some expressed their view that a requirement should only state the operational need and should not be constrained by either technology or cost. If such a requirement were approved, industry would be expected to meet that requirement, even if the technology were high risk and the cost of satisfying the requirement was high. It is when technology maturity and cost are considered that requirements can be tailored to provide a capability that is both achievable and of operational benefit.

The difference between KPPs and KSAs is often misunderstood. KSAs are ‘tradable’ but just who can approve the recommended trade is often not clear. Furthermore, industry interprets

KSAs as required to win the competition. KPPs, which are part of the Capability Development Document (CDD), describe “those attributes or characteristics of a system that are considered critical or essential to the development of an effective military capability,” which, if not met, will cause the system not to be produced (Ref 51). Therefore, the number of KPPs needs to be limited. An example of the right approach is the Joint Direct Attack Munition (JDAM), which has three KPPs: hit the target; must work; and cost less than \$30K a round. KSAs are “attributes or characteristics considered crucial in support of achieving a balanced solution/approach to a KPP or some other key performance attribute deemed necessary by the sponsor” (Ref 51).

The Assistant Secretary of the Army, Acquisition, Logistics and Technology (ASA(ALT)), PEOs and Army Materiel Command (AMC) have a broader mission and capabilities than just procurement of products and services. Yet, the Army acquisition community is too frequently viewed by the requirements development community and Congress as 'shoppers' for materiel. This is indicative of the mindset that the warfighter writes the requirement, the G-3 validates and prioritizes the requirement, the G-8 and the Comptroller resource the proposed program and it is the job of the acquisition community to 'shop' for the best source to meet the need. This serial approach is counter to the collaborative development of requirements by the combat developer and resource and acquisition professionals.

The Materiel Solution Analysis Phase and the Technology Development Phase is supposed to be a deliberate, rigorous, yet tailorable processes involving collaboration among the requirements/operations, cost/benefits analysis, technology, systems engineering, testing, acquisition, sustainment and contracting communities. Too often in the past, this has been attempted in a serial or committee approach. Integrated Product Teams (IPT) have been weakened in practice to where they are in effect committees because the participants do not have the authority to speak for and commit their organization.

To provide improved requirements in a considerably faster time, they should be developed in a collaborative process considering the issues and questions of all stakeholders. Army Regulation (AR) 71-9 provides for this with the Integrated Capabilities Development Team (ICDT) (Ref 19). Unfortunately, TRADOC has no authority to require participation, but can only “invite” those who do not participate and who will later critique the requirement.

TRADOC develops requirement documents and, when approved by the 4-Star CG TRADOC, they are submitted to the Department of the Army (DA) G-3/5/7 for validation. It is often at this time that the DA staff (G-1, G-3/5/7, G-8, etc.) begins to review, question, and challenge the requirement, rather than being part of the development of the requirement document.

Some have confused task forces and ICDTs with the historically successful, Headquarters, Department of the Army (HQDA)-chartered Special Task Forces (STF). As can be seen by the Second Generation Forward Looking Infrared (FLIR) STF scope, composition, authority and deliverables contained in the tasking in Appendix B.2, HQDA STFs for key ACAT I programs were successful because they had all of the following key features:

- Chartered by either the Chief of Staff of the Army or the Secretary of the Army.
- Co-chaired by a TRADOC MG and an acquisition SES technically qualified for the system pursued, and at a grade no lower than that of the affected PEO and TRADOC GO.
- Conducted off-site, outside the Washington, D.C., area for a finite period of performance and re-convened as necessary to prepare for the MS A and B decisions.
- Populated with experienced, qualified personnel with requirements development, operations, threat, operations research and systems analysis (ORSA), cost/benefits analysis, technology, engineering, testing, acquisition, sustainment and contracting skills.
- Organized similar to a major weapon systems SSEB, with at least the following elements: operational suitability; technical including technology, systems engineering, life cycle sustainment and testing; program management; cost analysis; and contracting.
- Tasked to produce a coherent, consistent and comprehensive set of products needed to support the upcoming Milestone Decision to include, but not be limited to: resource constrained ICD/CDD requirement and modernization plan; Acquisition Strategy (AS) with KPPs and risk management decision criteria; Test and Evaluation Master Plan (TEMP); Life Cycle Sustainment Plan (LCSP); tradeoff analyses, to

include AoAs; baseline cost estimate; recommended Management Decision Package (MDEP); draft acquisition plan; and the draft Request for Proposals (RFP).

The need for skilled operations analysts is clearly shown in the Army Modernization Strategy, yet the number of civilian analysts has not grown and the number of military analysts has shrunk dramatically (Ref 1).

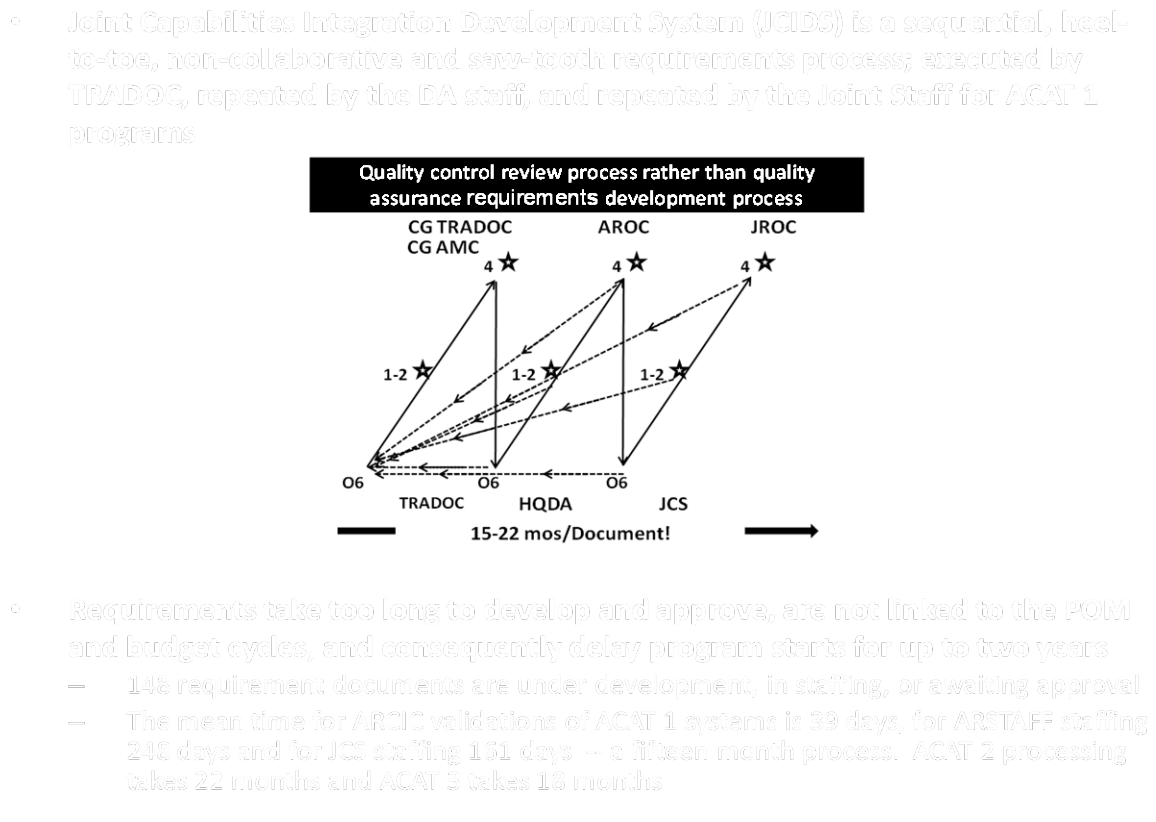


Figure 14. Requirements Development Not Collaborative

The Joint Capabilities Integration Development System (JCIDS) is a sequential, heel-to-toe, noncollaborative and saw-tooth requirements process; executed by TRADOC, repeated by the DA staff, and repeated by the Joint Staff for ACAT I and special interest programs. Once a requirement is approved by the commanding general (CG), TRADOC, it is submitted to G-3/5/7 at HQDA and is reviewed by the DA staff. Going through two reviews, as questions and issues are raised, it is returned to TRADOC for reconciliation. This process is repeated within Joint Chiefs of Staff (JCS) and DoD for ACAT I programs. This could be remedied if the reviewers were part of the development process from the beginning. AR 71-9 calls for an

ICDT to produce the requirement, and an ICDT could accomplish this coordinated, collaborative development. However, participation in the ICDT is voluntary; i.e., participants are “invited” without the authority for TRADOC to direct participation. Without the participation of the key stakeholders in the development of the requirement, the document is repeatedly graded and sent back to TRADOC for resolution. This grading process can be, and often is, repeated within HQDA and within JCS and DoD for ACAT I systems. The result is prolonged processing time. These organizations do not adequately participate in the development of the document to **assure** its quality but wait until it has been developed and approved in TRADOC to assess it and **control** its quality.

At the time of this report, 148 requirements documents are being developed or in staffing. The current mean time for TRADOC Army Capabilities Integration Center (ARCIC) validation of a requirement document is 39 days. The mean time for DA staffing is 248 days of which TRADOC takes 139 days to respond to both the 1-Star and 3-Star comments. For ACAT I and special interest items, the mean time for JCS staffing is 161 days, with TRADOC taking 56 days to respond to both JCS phase 1 and phase 2 comments. This results in an average of 15 months to staff a requirements document for ACAT I programs. The corresponding time to staff an ACAT II program is 18 months, and it is 22 months for an ACAT III program.

- **Rapid acquisition has been reasonably successful in quickly fielding critical materiel to combat forces, counter to the broken conventional process**
 - AR 71-9, December 2009, Chapter 6 provides a reasonable process for UONS approval or disapproval, but the process requires urgent and timely execution
 - Accepts UONS as the requirement statement
 - Requires immediate access to appropriated “no color” funds for this purpose
 - Requires mature technology and relies heavily on COTS and GOTS
 - Decisions to transition rapidly fielded equipment to programs of record, terminate, or retain only for current conflict made by TRADOC and HQDA G-3 Capabilities Development for Rapid Transition (CDRT)
- **No DoD nor Army policy for rapid acquisition (UONS) during quiescent periods**

Figure 15. Rapid Acquisition and Fielding Initiatives Fill Urgent Operational Needs (UON)

The Army needs a means to rapidly acquire materiel in a period of 2 to 24 months in response to warfighter urgent needs, ones that if left unfulfilled, will seriously endanger personnel and/or pose a major threat to ongoing or imminent operations. The urgency of these needs requires the use of proven technologies and acceptance of 75-80% solutions.

The Army has two organizations related to rapid acquisition: Rapid Equipping Force (REF), part of the Army Asymmetric Warfighting Office reporting to the G-3, and the Rapid Fielding Initiative (RFI), a component of PEO Soldier.

In August 2002, the REF was formed as a part of the Department of the Army Deputy Chief of Staff G-3/5/7, reporting directly to the Vice Chief of Staff Army. The REF works one-on-one with operational units to field innovative solutions for their immediate equipping needs. The REF assesses a unit's needs and provides off-the-shelf solutions, both government and commercial, to reduce risks to soldiers and help increase their effectiveness. The REF partners with industry, academia, senior leaders and Army acquisition and test organizations as it deploys teams of experts forward to evaluate deployed unit's needs and capabilities. To date REF has introduced almost 800 different types of equipment and provided more than 80,000 individual equipment items to deployed units worldwide.

PEO Soldier developed the RFI program in November 2002, when PEO Soldier representatives met directly with soldiers in Afghanistan to gather feedback about

inadequacies in equipment. RFI fields off-the-shelf equipment that enhances Soldier survivability, lethality and mobility. Currently RFI contains 73 items on its equipment list. The RFI list includes two types of equipment: (1) equipment every soldier receives, such as helmets, clothing items, ear plugs, visual language translator cards, and hydration systems and (2) equipment fielded to units, such as medical kits, spotting scopes, laser range finders, ammunition carriers and door rams. To date, more than 1.4 million sets of RFI equipment have been issued.

An essential capability of any rapid acquisition organization is immediate access to the necessary 'uncolored' funds. This has been accomplished during the Iraq and Afghanistan conflicts through the Iraqi Freedom Fund and with Overseas Contingency Operations (OCO) funds.

While the Congress provided DoD "Rapid Acquisition Authority" to reprogram up to \$100M, attempts by DoD to obtain a "Rapid Acquisition Fund" have failed. Without such funding, rapid acquisition will not be possible once OCO funding is terminated.

The Army's Capabilities Development for Rapid Transition (CDRT) committee, chaired by TRADOC ARCIC teamed with G-3 meets quarterly, to determine which systems acquired through rapid fielding should be terminated, retained in theater only for the current conflict or transitioned to programs of record. In the latter case, the system enters the traditional acquisition process with little to no credit for its operational experience.

The Army needs the capability to acquire equipment rapidly after the current conflicts in Iraq and Afghanistan end, but there is no Army or OSD policy to perform rapid acquisition in quiescent periods.

II.2 RISK MANAGEMENT IS DEFICIENT

- **22 ACAT I programs terminated since end of the Cold War – Root causes of troubled programs often stem from:**
 - ACAT I program pre-MS B activity and products up to and including draft RFPs were not developed in a collaborative, disciplined process involving the requirements, resourcing and acquisition stakeholders insuring coherence and consistency in all products
 - Reprioritization and restructuring induce schedule stretches that enable technology and requirements creep
 - Optimistic Technology Readiness Level (TRL) assessments result in program cost and schedule breaches and eventual termination
 - Technology integration and manufacturing readiness are often the overriding challenge
 - Support for the requirement can change with leadership changes
- **Acquisition culture has increasingly become risk averse, placing more attention on preventing mistakes than managing risk**
- **Risk aversion culture leads to insatiable oversight staff requirements, whereas risk management is fed by insight of highly qualified leaders and small staffs**
- **Statutory and regulatory requirements are so extensive (see B.4 and B.5 in Appendix B) that it takes an excessive amount of time and effort to proceed in a development program**
 - Too many people are involved in the process
 - Meeting the requirements is often a “heel to toe” process

Figure 16. Army Plagued by the ‘Acquisition Death Spiral

As was mentioned earlier in this report, our review studied 22 ACAT I programs cancelled since the end of the Cold War. Some of the major causes included:

- Pre-MS B activity and products up to and including the RFP were not developed in a disciplined process sufficiently involving the requirements, resourcing and acquisition stakeholders to insure consistency and coherence in all products required for milestone decision and selection of the best solution to the requirement.

- Reprioritization and restructuring induce schedule stretches that create opportunities for technology and requirements creep.
- Technology Readiness Level (TRL) assessments are optimistic or inadequate, resulting in technology risk not being eliminated prior to start of EMD, with consequent program schedule slippage and/or cost overruns.
- Technology integration, systems engineering and manufacturing readiness are often the overriding challenge.
- Support for a program is too often subject to change with a change in leadership, resulting in reprioritization and funding instability.

"The quest for excellence in defense management will be successful only if a new management philosophy can replace the old. Instead of concentrating on the things that are being done wrong and trying to fix them with more laws, more regulations, and more inspectors, DoD should concentrate on those things that are done right and use them as models."

– Packard Commission, June 1986 (Ref 43)

The Army acquisition culture has increasingly become risk averse, placing more attention on not repeating mistakes than on managing risk for the best outcome. Even with this laborious process, new weapon systems continue to enter engineering and manufacturing development prematurely with technological risk, leaving a legacy of program cost overruns, reduced quantities fielded and terminations. There is not only concurrency between EMD and production, but also between technology development and EMD. This results in many cancelled programs; delays in fielding needed capabilities to the operational force; sunk costs in the billions along with the associated opportunity costs; counterproductive, costly government and industry overhead; and increasingly dissatisfied customers.

The Anti-Armor Weapons System – Medium (AAWS-M) program provides an example where proper risk management, government subject matter experts and Defense Advanced Research Projects Agency (DARPA)/Army S&T investment enabled the Army to work through a technology risk that was underestimated at MS B. The AAWS-M program on several occasions was near termination because of two problems, an overly optimistic weight

KPP and an immature seeker focal plane array technology. Because of concern about overloading the infantryman, the original AAWS-M weight limit from the Infantry Center was 45 pounds. There were functional staffs who, during the development phase, wanted to cancel the program because an effective AAWS-M could not be provided at this weight; however, cooler warfighting and engineering heads prevailed and the system was eventually delivered at less than 50 pounds. Another example of managing risk, along with the importance of having qualified experts available in the DoD RDT&E community, was the seeker. The infrared focal plane array (IRFPA) technology bid by the winner of the EMD phase proved immature. The defect rate and yield of the production process for this technology proved unacceptable. Even though the technology assessment performed prior to EMD selection proved optimistic, Army and industry sensor technologists accurately diagnosed the production problem. The Army Night Vision Laboratory (NVL) technologists had joined DARPA years before to fund an IRFPA producibility technology program with industry. Hence, the Army was able to switch to suppliers with a proven advanced, producible IRFPA technology for the seeker. Because of this effort the Army now has the Javelin, a battle proven, superior anti-armor missile for the individual infantryman (Ref 147).

The pre-MS B process has become bloated with numerous reviews and deliverables appealing to a growing collection of interests that have diminishing value added. This hampers thoughtful trade studies, trustworthy cost and risk analyses, sound analysis of alternatives and sound MS A and B decisions. There are too many unaccountable staffs issuing 'guidance' or 'direction' that are not accountable for the impact they have on a program. In the past there have been too many paper Army Requirements Oversight Councils (AROC) and Army Systems Acquisition Review Councils (ASARC). As was pointed out in the Reno Report: "A 'paper' AROC denies the Army the ability to address recommendations in a deliberative, give-and-take challenge of what can be huge future investments" (Ref 238).

Although the DoD 5000 series advocates tailoring the acquisition strategy to what is most appropriate, given the scope and nature of the program, the bureaucratic impediments to complying have not been removed nor has proper risk management been incentivized.

- **Competitive prototyping prior to MS B can reduce technical risk, help refine requirements, improve the quality of cost estimates and enable better informed cost/performance trade-offs – usually leading to reduced fielding time**
- **Technical Data Packages (TDP), intelligently acquired when the Government has the leverage, are effective tools to enable risk reduction and price competition**
- **The Nunn-McCurdy Act, as amended by the Defense Authorization Act of FY2006, requires the costs of block changes and changes in procurement quantities to be added to Original System APB, triggering misleading breaches**
- **A number of programs entering formal Development Testing experienced early human factors/soldier-equipment interface problems, delaying formal test start for hardware/software fixes and requiring additional individual and crew training**
- **Company Independent Research and Development (IRAD) has become near-term, focused on what a company needs to win the next program contract and, in many cases, looks like Bid and Proposal (B&P) activity**
- **International Traffic in Arms Regulations (ITAR) are a barrier to export and to US technology remaining ahead globally**
- **Network and information systems acquisition is inherently different from weapon systems, yet the acquisition system does not adapt to these differences**
- **The Army lacks a sufficiently robust and trustworthy database on acquisition programs, workforce and lessons learned**

Figure 17. The Army Does Not Practice Sound Risk Management

Numerous acquisition studies and DoD directives have recommended competitive prototyping at the component, subsystem and even system level prior to EMD as a proven means to reduce technical, schedule, cost and performance risk. Pre-EMD prototyping was a major factor in the success of many of the programs studied, including, but not limited to the following: the Advanced Attack Helicopter (AAH, later Apache), the Utility Tactical Transport Aircraft System (UTTAS, later Black Hawk), the T700 engine, the T800 engine, the Main Battle Tank (MBT, later Abrams), the M9 Armored Gun System (AGS) and AAWS-M (later Javelin). Coupled with system integration laboratories and state-of-the-art advanced computing and simulation, prototyping is a powerful method to understand and eliminate

technological risk and mitigate engineering risk. Unfortunately, too often acquisition strategies omit this in order to shorten schedule and lower development cost, only to result in more development time and life cycle cost due to technical problems during EMD that could have been prevented with competitive prototyping.

Our interviews revealed that access to Technical Data Packages (TDP) is not being obtained as often as should be. With access to a sound TDP, the Army has been able to break-out subsystems and components successfully and achieve rewarding price competition during production. In addition, ownership of, or at a minimum, easy access to TDPs is necessary for compliance with U.S. statutes that require maintenance of organic core depot capabilities, for supporting items that have reached their terminal logistics date and for enabling modernization through spares. During system competitive phases the government has the leverage to buy or assure access to a TDP at a fair price, and should exercise this leverage.

The National Defense Authorization Act of 2006 (PL 109-63) amended the Nunn-McCurdy act by requiring costs of 'administrative changes' such as block improvement programs or procurement of additional platforms beyond the original basis of issue plan (BOIP) be added to the approved original program cost; thus Approved Program Baseline (APB) costs of a block upgrade or added quantities can result in a Nunn-McCurdy breach for an otherwise successful program (Ref 225). An example of this is an addition of \$2.5 Billion through FY2015 to buy 56 additional Apache 64D model helicopters required for use in current conflicts. The amended Nunn-McCurdy Act required that the \$2.5 Billion be added to the APB of the original Apache, which triggered reporting of a Nunn-McCurdy breach, even though the overall program was performing well (Ref 225). This is counter to the intent of the Nunn-McCurdy breach reporting requirement, creates unwarranted reporting and reviews, causes delays in deliveries of critical assets, creates wasteful program instability and is a disincentive to the intent of DoDI 5000.02, which strongly encourages an incremental upgrade approach.

A number of programs, including Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) modifications, entering formal developmental testing experienced early human factors/soldier-equipment interface problems, delaying formal test start for hardware/software fixes and requiring additional individual and crew training. This often is the result of not considering Manpower Personnel Integration (MANPRINT) issues until after MS B, rather than prior to MS A, or at the very beginning of modification, when these

can be considered in developing the Systems Engineering Plan and incorporated in the AoA. Problems noted include insufficient training, poor control and display layout and location, and inadequate contractor testing. The required modifications resulted in program schedule slips and cost growth.

Counter to its purpose, Independent Research and Development (IRAD) has become near-term focused on what is needed to win the next contract. The government no longer has visibility into the IRAD work by a given company since OSD eliminated IRAD on-site reviews.

The Arms Export Control Act regulates the export of goods and services to allies through International Traffic in Arms Regulations (ITAR) (Ref 57). ITAR contains the U.S. Munitions List, which broadly describes items and services subject to ITAR controls. All US-origin technology, whether incorporated in a military system or not, is subject to regulation and export control by ITAR, unless adjudicated otherwise by a Commodity Jurisdiction. If a technology or service is declared “US Only – Not for Export” under ITAR, then foreign military sale, direct commercial sale to any foreign entity and government-to-government transfers of the item are prohibited. Once designated “US Only – Not for Export,” items are rarely removed, even though technology progresses to a point where the listed item is of little value, widely available from foreign sources or no potential threat to U.S. defense forces.

The rigor of the ITAR, and the near-eternal restrictions on items in its Munitions List, may influence U.S. companies to withhold advanced technologies from DoD systems. These stringent export controls are a significant issue to U.S. industry and the President approved an “Export Control Reform Initiative” in August 2010 (Ref 266). The SecDef is the government lead for this effort, and has focused on two major tasks for DoD:

- Redacting the existing Munitions List to retain strict control of key technologies while relaxing controls on items or technologies more or less commonly available from foreign sources.
- Substantially reducing the cycle time for obtaining interagency agreement on the release of advanced technologies.

Initial results from these two efforts appear promising.

Many recent studies and assessments have concurred that the acquisition of information technology for combat systems, for enterprise systems, and for networks needs a different set of acquisition rules than DoDI 5000.02 which governs weapons systems and platforms. Among them are the HASC Committee Report on Defense Acquisition Reform March 2010 (the “IMPROVE report”) and the BENS report (Refs 122 and 45).

Like the Gansler Commission, our review found that the Army lacks a sufficiently robust and trustworthy database on acquisition programs, work force and lessons learned (Ref 58). Getting data on such basic questions as how many systems engineers the Army has and what are the trends in quantity and qualifications, proved impossible. We were also unable to get anything other than a gross estimate of the number of contractor personnel in the acquisition workforce. Major program lessons learned and programmatic histories (e.g., cost, schedule and performance variances from the program baseline) are scarce and/or unreliable. Those charged with requirements development, development planning, program management and milestone decisions, needs a robust, readily accessible database and associated analytical capability to extract relevant data.

II.3 BIG 'A' IS NOT ALIGNED

- **There appears to be confusion, unnecessary duplication and an erosion of confidence between the Army Secretariat and Service staffs in each other's ability to execute their 'Big A' responsibilities, as expressed in the HASC IMPROVE Panel Report, 23 March 2010**
- **Since 2002, the VCSA no longer co-chairs the ASARC with the ASA(ALT)**
- **Capability Portfolio Reviews (CPR), chaired by VCSA:**
 - Assess the status and continuing requirement for programs within the portfolio
 - Are a vital management practice to ensure Army Senior Military Leadership involvement in oversight of Army programs
 - Improve alignment of requirements, resourcing and acquisition
 - Do not currently examine interdependencies across portfolios
 - Are not currently supported by any analytic tools
 - Have the potential to improve the continuity of requirements across Army leadership changes
- **With the elimination of the DUSA (OR) in 2006, the Army lost its single, independent, and credible voice for ORSA, requirements, prototyping, experimentation and testing across the Army, at OSD and on the Hill**
- **There is a lack of alignment between Battlefield Operating Systems, defined by FM 41-10; with Warfighting Functions; defined by FM 3-0; with Centers of Excellence, defined by TRADOC REG 10-5-1; with JCIDS Capability Areas; with VCSA Capability Portfolios and with PEOs**
- **The Army 4-Star ASTAG and 2-Star ASTWG which approve the S&T vision, strategy, priorities and resource constrained plan are out of phase with the PPBES cycle and need to get in synch to be relevant**
- **PEO Soldier is encumbered by more than 70 different funding lines spanning multiple TRADOC Centers of Excellence and acquisition organizations**

Figure 18. Strategy, Plans, Priorities and Management Not Aligned

The HASC IMPROVE report states, “The Panel is concerned that the divide established in the Goldwater-Nichols Act between acquisition and the military service chiefs has become so wide that it hinders both the acquisition and requirements process.” Many of our

interviewees expressed this same concern regarding the Army. Although the Goldwater-Nichols Act clearly states that acquisition activities are the responsibility of the Service Acquisition Executive, this does not and should not preclude collaboration, teamwork, cooperation, and debate/discussion between the senior Army civilian and uniformed leadership.

Many interviewees expressed the view, real or perceived, that the traditional partnership between the ASA(ALT) and the Vice Chief of Staff of the Army (VCSA), which has served the Army Big A well, has eroded in recent years, perhaps due in part to the heavy pressures of continuous combat deployments.

Previously, AR 70-1 had the VCSA as co-chair of the ASARC. In 2002, General Order 3 dropped that responsibility from the VCSA and identified the ASA(ALT) as the sole ASARC chair. That change is reflected in the 2003 version of AR 70-1, 31 December 2003: "At each milestone review, the MDA [milestone decision authority] must have a balanced assessment of a program's readiness to proceed into the next acquisition phase. Review fora may be formal or informal at the discretion of the MDA. The Army Systems Acquisition Review Council (ASARC) is the Army's senior-level review body for all ACAT I and ACAT II weapon system and Command, Control, Communications, Computing and Information Technology (C4IT) programs. The ASARC is chaired by the ASA(ALT)." The ASARC advises the Army Acquisition Executive (AAE). It is the Defense Acquisition Executive (DAE) and the AAE who are the milestone decisions authorities for acquisition and sign the acquisition decision memorandum. In the early stages of program development, getting the requirement, priority and quantities right is paramount and this can be orchestrated best by the VCSA.

The VCSA's Capability Portfolio Reviews (CPR) are a valuable means of assessing status, priorities and needs of the elements within each portfolio, and provide senior military leadership oversight of complex, but interrelated, capability areas. The CPRs would be even more valuable if provided analytic support that could address and assess interdependencies across portfolios. CPRs are intended to "...conduct an Army-wide, all components revalidation of requirements. The approach is to holistically examine, validate, modify, or make recommendations to terminate requirements driving capability development, acquisition, and sustainment across a series of portfolios we define, but roughly align to those defined by DoD" (Refs 31 and 250).

The Aviation CPR is widely acknowledged by the senior Army leadership as the model CPR. Central to its success was the collaboration and agreement within the Aviation community as to what their desired plan was and what decisions they needed out of the CPR. There is a long tradition in the Aviation community of the Aviation Branch Chief/CG Aviation Center of Excellence (CoE), CG Aviation and Missile Life Cycle Management Command (LCMC), the Aviation Applied Technology Directorate, Army Special Operations Aviation, G-3/5/7 Aviation Task Force and PEO Aviation working through issues, developing priorities, formulating a coherent resource constrained modernization plan and speaking with one voice.

The majority of CPRs are organized by function. There is no analytic tool that shows comparative system contributions to that function and their associated cost. Therefore, a ranking of systems, and the ability to assess the capability gaps and the advantage of adding a new system to the portfolio is lacking. Such a tool is not available to the G-8 or VCSA. Further, there is no tool(s) to compare systems contributing to multiple portfolios and to examine contributions and tradeoffs among portfolios needed for POM/budget decisions and system justifications with OSD and the Congress.

In the past, the analytic support and backup for the VCSA's and other Army Staff (ARSTAFF) reviews and decision bodies came from the Deputy Under Secretary of the Army (Operations Research) (DUSA(OR)), but this position was eliminated in 2006. The DUSA(OR) was the spokesman for Army studies, analyses and testing within the Army and with DoD. With the elimination of this position, the Army lost its single independent voice across the Army, in the JCS, at OSD and on the Hill for ORSA, requirements, prototyping, experimentation, and testing. Historically, the DUSA(OR) was a trusted, respected, honest broker for the veracity of analyses, testing results and documentation presented at acquisition milestone and requirement reviews, e.g. ASARC, Defense Acquisition Board (DAB), AROC, etc. The DUSA(OR) sat on the ASARCs and was the major player in resolving disconnects between Army developers, users, and testers and between the ARSTAFF and OSD and Congressional staffs. As a Deputy Under Secretary, he looked across all functions without partiality and had the knowledge, experience and stature to see all sides of an issue and guide the relevant parties to a resolution.

In addition, the DUSA(OR) was the leader of Army analysts and evaluators as well as analysis. The loss of this position has contributed to the deterioration of Army independent

analysis and downgrading of the functional career. The DUSA(OR) office, consisting of nine people, including three military analysts, supported all acquisition boards, councils, and committees and was responsible for the rigor, thoroughness and overall quality of Army analyses including test and evaluation results. Specifically, the mission of the DUSA(OR) office was (Ref 291):

- Managing the Army Study Program, the Model Improvement Program, and the Simulation Technology Program.
- Establishing policy for operations research and systems analysis activities for Department of the Army analytical support services.
- Supporting the ASARC, Defense Acquisition Board, and similar systems acquisition review committees.
- Providing policy and program direction for the Army Officer Operations Research Education Program.
- Approving test-related documentation for the Department of the Army and forwarding it to the Office of the Secretary of Defense.
- Serving as principal Department of the Army interface with the Director, Defense Research and Engineering, and the Director, Defense Operational Test and Evaluation.
- Providing policy and oversight for Army Contracted Advisory and Assistance Services.

Military and civilian ORSA capabilities and competencies have deteriorated across the Army with the elimination of the DUSA(OR) and the consequent downgrading of the functional career manager role.

There is a lack of alignment between Battlefield Operating Systems (BOS), defined by FM 41-10; Warfighting Functions, defined by FM 3-0; TRADOC Centers of Excellence, defined by TRADOC Regulation 10-5-1; JCIDS Capability Areas; VCSA Capability Portfolios and

with PEOs. Better alignment of the stakeholders, their organization, and how they store, retrieve and analyze Big A data will enhance transparency, coherence, productivity and efficiency. We first noticed this misalignment in searching for a trustworthy database to guide us to appropriate programs, issues, trends, solutions and successes. As is explained later in the next section, entitled “Requirements and Acquisition Resources Are Inadequate,” we found none. Therefore, there is no realistic, formal ‘corporate’ way to track successes, analyze failures and develop ‘best practices’ and ‘lessons learned’.



Ref 20

Figure 19. Annual ATO Development, Review, and Approval Process

The Army Science and Technology Master Plan (ASTMP) shows another disconnect (Ref 20). As explained in the ASTMP, the Army annually issues Army Technology Objectives (ATO) and priorities guidance to the S&T, materiel and TRADOC communities. The Army S&T Working Group (ASTWG) is co-chaired by the DASA(R&T) and the G-8 FD. The Army S&T Advisory Group (ASTAG), co-chaired by the ASA(ALT) and the VCSA, annually validates the ASTWG decisions. As shown in Figure 19, the ASTWG and ASTAG schedules are not synchronized with the POM build and approval cycle. The 2-Star Army S&T Working Group (ASTWG) does not conclude its efforts until the August timeframe; therefore, the 4-Star level ASTAG cannot validate the portfolio and/or change priorities in time to provide direction until late September or October. Both bodies need to complete their efforts much earlier in order to prioritize and influence the Army RDT&E budget submission and the POM. The process has become very bureaucratic, is in need of synchronization with the POM and budget development cycles and is at risk of losing its relevancy to Army Planning, Programming, Budgeting, and Execution (PPBE) decisions.

PEO Soldier is gravely encumbered by 76 different funding lines and 468 products spanning multiple TRADOC Centers of Excellence and acquisition organizations. This counterproductive bureaucracy engenders program funding and requirements instability and delays clothing, weapons and individual equipment to our deployed and deploying soldiers.

- With the creation of the RDECOM and the ACC, and the expansion of PEO life cycle responsibilities, LCMCs are becoming marginalized
- There are concerns that AMC is considering transferring HCA authority from the LCMC CGs to the ACC
- Depots, Directorates of Logistics and Integrated Materiel Management Centers' (IMMC) functions/responsibilities are best located at the LCMC, not the Sustainment Command
- RDECs perform a vital role as 'smart buyers', provide qualified technical matrix support to the PEOs and source selection boards
- PEOs and PMs are the RDEC's major customer - they have the funding and desire to select the matrix support source that best meets their needs
- RDECOM provides insufficient value added to justify a staff of 332 (290 DAC, 36 officers, 6 enlisted) and an additional management layer between its customers and the RDECs and ARL
- AMSAA and Survivability/Lethality Directorate (SLAD) are divided and subordinated in RDECOM with LOGSA reporting to AMC G-3, significantly eroding their technical competence and their impact in the requirements and acquisition process
- The remaining Advanced Systems and Concepts Offices (ASCOs) are marginalized

Figure 20. Organizational Layering, Overlapping Missions and Low Value-Added Oversight Are Unaffordable

"1. Clear command channels. A commercial program manager has clear responsibility for his program, and a short, unambiguous chain of command to his chief executive officer (CEO), group general manager, or some comparable decision-maker. Corporate interest groups, wishing to influence program actions, must persuade the responsible program manager, who may accept or reject their proposals. Major unresolved issues are referred to the CEO, who has the clear authority to resolve any conflicts."

-Packard Commission, June 1986 (Ref 43)

This excerpt from the Packard Commission report outlines this enduring best practice for eliminating low value added oversight, organizational layering and overlapping missions. Rather than putting the onus on the PM to convince functional staffs that their product meets their standards, the onus should be on the functional to persuade the PM to address

their concerns. If the PM declines to meet the functional staff's concerns, the functional staff would have to convince the PEO to take action. This essentially shifts the burden of proof.

In 1969, the Defense Science Board (DSB) Task Force on Research and Development Management found: "It is time that DoD got lean and hard at the top and through middle management with experienced and professionally oriented people who need policy and objectives for guidance and not procedures" (Ref 73).

More recently, the Center for Strategic and International Studies' "Beyond Goldwater-Nichols" report decried defense acquisition's top-heavy, process-focused staffing and complex processes (Ref 164):

"Even though there are fewer new programs in platforms and overall systems, defense acquisition is encumbered by a top-heavy, process-oriented acquisition process. USD(AT&L) currently has 1,500 personnel (500 billets and about a thousand contractors) and program managers face a seemingly endless number of Integrated Product Team (IPT) and sub-IPT meetings. A recent DSB Task Force... concluded that today's acquisition process was "an extremely complex system requiring many inputs from many organizations with many people who can say 'no' but few who can say 'yes'."

"Every time there is a shortfall in a study, more Headquarters DA staff is created; most of the time with no value added." – Army PEO

We found that the Army has created counterproductive, stifling acquisition organizational layers with overlapping missions performing low-value-added oversight that is often not accountable for its role in affecting poor acquisition results. With the supplemental budgets ending, DoD seeking to reduce its overhead and infrastructure costs by at least \$100B in the POM years, and the failure of so many programs at such a high opportunity cost, the Army cannot afford these organizational layers, positions or processes that are low-value-added or hinder increased productivity. The growing overlap and duplication of effort between RDECOM, the LCMCs and the PEO/PM office structure must be ended.

With the creation of the RDECOM and the aggregation of all RDEC scientists and engineers into RDECOM; the creation of Army Contracting Command (ACC) with LCMC professional

contracting personnel integrated into it; and the expansion of PEO logistics responsibilities, the LCMC Commander has far less authority and assets for life cycle support of the commodity-oriented PEOs and PMs at his location. As one LCMC CG put it, “the LCMCs have become ‘Balkanized.’”

The commodity/branch-oriented LCMCs have served a fundamental purpose in Army Acquisition, whether known as “commodity commands,” “system commands” or “LCMCs.” These commands are oriented to the same products, technology and battlefield functions as the PMs/PEOs/warfighters supported, and provide very cost-effective and product-tailored staff, technical, logistics and contracting support. As such, the LCMCs provide multi-functional, matrix support to PEOs, PMs and the corresponding TRADOC warfighting CoEs and logistics support to fielded systems. Aggregation of the technical, logistics and potentially the Head Contracting Authority (HCA) from each of the Life Cycle Management Commands into two or three separate single function commands, such as RDECOM, Contracting Command and Sustainment Command will not increase the efficiency of Army Acquisition management, but decrease it. The life cycle sustainment mission requires system-oriented engineers, contracting officers and item managers and rightly belongs at the LCMCs in direct support of co-located PMs and their developing and fielded systems. Otherwise, PMs/PEOs will create their own fast-paced and responsive customer-based/contractor-supported life cycle support team to the detriment of legacy systems.

There are concerns that some executives at AMC HQ also want to migrate the LCMC Head of Contracting Authority (HCA) function to the ACC. Some interviewees asserted that there are discussions underway to transfer the depots and inventory control function to Sustainment Command. All this is ill advised, considering that the LCMC CG has the local, commodity and mission area knowledge, access and expertise and works directly with a corresponding TRADOC CoE.

Should this transfer of functions occur, the LCMC CG, the on-site commander who knows the warfighting products’ support needs and technology best, will have meager assets to support his commodity in development, in production and in the field. This migration of functions and responsibilities away from the on-site commander to three separate commands is centralization by support function and process, rather than by combat capability and product. Given the diversity of Army needs – small arms and individual equipment to Mine Resistant Ambush Protected (MRAP) vehicles to Apache helicopters – this split authority

cannot be as effective for our soldiers as the LCMC model and will lead eventually to consolidation of most important functions under the PEO/PMs, with consequent expensive PM/PEO staff growth and a necessarily reduced focus on getting new capabilities to operating forces.

Some of this LCMC capability erosion was evident during our interviews when concerns were expressed that it was difficult for PEOs, PMs and TRADOC to get quality expertise matrixed to support them. In many of those instances, they reverted to contractor support. HQDA and TRADOC specifically need LCMC technical support for ICDTs per AR 71-9, and for HQDA STFs and SSEBs (Ref 146).

In examining the issues above, we determined that RDECOM, the aggregation of the technical functions of each LCMC and the Army Research Laboratory (ARL) and Army Materiel Systems Analysis Activity (AMSAA) into one command headquarters at Aberdeen Proving Ground, MD, provides insufficient value-added to justify the HQ RDECOM staff of 332. It has created another management and oversight layer between AMSAA, ARL and RDECs and their customers. Also, it has not significantly reduced duplication of effort across the RDECs, improved matrix support to the PEO/PMs, or improved the productivity AMSAA, ARL or the Army Research Office (ARO) (Ref 63).

The Army needs a critical mass of analytical talent. AMC has placed the majority of its analytic (ORSA) capability in two organizations (AMSAA and the Survivability and Lethality Analysis Division (SLAD)) in RDECOM and its data collection and development in a separate reporting organization, the Logistics Support Activity (LOGSA). In addition, the analysts of the SLAD are buried in the Army Research Laboratory under the Deputy CG of RDECOM. The AMSAA, the key analytical group for AMC, is a separate reporting organization in RDECOM and LOGSA reports to the AMC G-3, significantly eroding their impact and authority in the requirements and acquisition processes. At a time when the Army has a shortage of analysts, it cannot afford to pigeonhole and piecemeal out analytical assets. This organizational relationship does not provide AMC a unified, effective analytic organization (like the Center for Army Analysis and TRADOC Analysis Center (TRAC)) responding to the AMC Command Group to conduct, coordinate, prioritize, and supervise the quality of studies and analyses within AMC.

The root causes for troubled and terminated programs usually stem from the developmental planning period from before MDD to Milestones A&B. This phase of acquisition was also cited by the Weapons System Acquisition Reform Act (WSARA) of 2009 for special focus as a critical time to “address systemic problems in major defense acquisition programs” (Ref 226). In response to this deficiency, OSD has established the new position of Director for Systems Engineering.

In addition to a timely and productive requirements development capability, Army acquisition must have its own organic capability to:

- Lead pre-Milestone A advanced systems concept formulation, explore promising advanced technology concepts, and conceive and advocate advanced programs before there is a Program Manager assigned;
- Serve as an honest broker for the prioritization of required technology programs.

The Advanced Systems and Concepts Offices (ASCO) (in some cases called Directorates for Advanced Systems) at the RDECs were created to do this, but have been either eliminated, relegated to RDT&E planning shops or otherwise marginalized. To some extent this is the result of the acquisition personnel cuts starting in the mid-1990s. They are incapable of performing most of the developmental planning functions to include, but not limited to: critical advanced concept development, parametric design and analysis, technology assessment and RDT&E planning functions. This RDEC organic capability is a critical source of: innovation; ‘smart buyer’ talent; developmental planning; analytical and engineering expertise for the collaborative development of sound requirements and acquisition strategies; and competent source selections.

- **PEO/PMs understand they are accountable for meeting their program baseline cost, schedule and performance**
- **DA, AMC, ATEC and TRADOC staffs, committees and IPTs are not being held accountable for their impact on a program baseline, execution and outcome**
- **There is no Army policy on 'Big A' line and staff accountability**
- **DAU lacks a course on staff and management accountability**
- **There has been a significant growth in the number of contractors performing 'gray area' and inherently Governmental jobs**

Figure 21. Accountability is Lacking

Every PM and PEO interviewed knew their mission, clearly understood their responsibilities and was focused on meeting cost, schedule and performance thresholds – including immediate responsiveness to warfighters' readiness needs. The PMs have assumed many of the LCMCs' post-fielding logistics responsibilities, blurring accountability. Some staff officers and civilian employees at AMC, TRADOC, Army Test and Evaluation Command (ATEC) and HQDA looked at IPTs as committees and study groups without the accountability to review and act in concert with the PM to resolve issues, hold down costs and meet schedules. In some cases the activities of these staff and IPT groups in asking for more data and more time to review it seriously affected program execution and resulted in program cost growth. The panel found no Army policy establishing the accountability of staff officers and IPT members in helping the PMs meet established costs, schedule and performance objectives. Defense Acquisition University (DAU) lacks a course on staff and management accountability. Even the short film on accountability is no longer used.

Of even more concern to this review panel is the growing number of contractors performing "gray area" and what would appear to be inherently governmental jobs, such as serving as Department of the Army System Coordinators (DASC) for the ASA(ALT). The DASC position is a high-responsibility position, representing the PM and the ASA(ALT) in the Pentagon, preparing principal staff officers for systems reviews, writing 'read aheads' for ARSTAFF principals, representing the system PMs on IPTs and alerting OASA(ALT) principals and their PMs of HQDA issues with acquisition programs, especially 'bill payer' drills that can result in program slips or kills. These staff actions should define DASC duties as 'inherently governmental', and service as a DASC is outstanding preparation for project management duties. Yet 19% of the serving DASCs are contractors and should not be in such

key acquisition assignments. Filling DASC positions with contractors also precludes using the positions to grow and train military and DA civilians for positions as Project, Assistant Project, and Product Managers.

Compounding the DASC issue and limiting their effectiveness is their location in leased facilities away from the Pentagon. The DASCs must make a significant effort to meet with their G-8, G-3/5/7 and OASA(ALT) counterparts to keep up with Pentagon priorities and budget actions. Some do not make this effort and their programs suffer accordingly.

II.4 REQUIREMENTS AND ACQUISITION RESOURCES ARE INADEQUATE

- **While the missions associated with Capability Development have significantly increased, the required and authorized Capability Development manpower in TRADOC has remained relatively constant; the:**
 - Authorized civilian and military percentage of requirements for FY2010 is only 57%
 - Fill rate of the authorized military in capability development is only 72%
 - No qualified PhD-level scientists to understand technology and properly interface with the Acquisition Corps
- **The increased need for analyses to determine materiel needs and to conduct trade-off determinations, cost-benefit analyses, and analyses of alternatives has occurred with:**
 - No significant increase in the number of authorized civilian (1515) analysts
 - A decrease of 55% of authorized military (FA 49) analysts

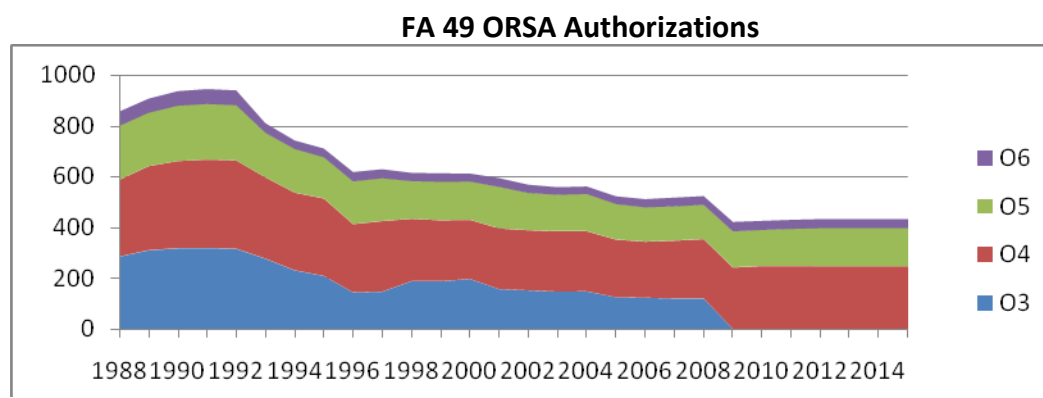


Figure 22. Declining Analytic Capability in a Time of Increased Demand

While the missions associated with capability development (Capability Based Assessments, cost/benefit Analyses, AoAs, development of requirement documents, etc.) have significantly increased, the required and authorized manpower associated with capability development in TRADOC has remained relatively constant. However, the authorized civilian and military percentage of requirements for FY2010 is 57%. Further, the fill rate of the authorized military in capability development is only 72%. While capability development requires an

understanding of technology and the ability to professionally interface with the Army Acquisition Corps, TRADOC has no qualified PhD-level scientists to perform this function.

The acquisition of Army materiel requires analyses to determine materiel needs and subsequent analyses to conduct tradeoff determinations, cost-benefit analyses, and AoAs. This increased need for quality Army analysis has occurred without any increase in the number of authorized civilian (1515) analysts and a decrease of 55% of military (Functional Area (FA) 49) analysts. These military analysts provide the context and understanding of analytic results of military conflicts.

- **Within TRADOC, only 56% of the analysts required to perform these analyses are authorized (53% FA 49 and 58% 1515). Compounding this problem:**
 - The fill of authorized military analysts is only 56%, meaning only 29% of the required military analysts are on hand
 - Approximately 40% of civilian analysts in TRAC, as well as AMSAA, are funded by reimbursable work, which precludes their availability for required trade-off, cost benefit and AoA analyses
- **AMSAA has a requirement for 15 military analysts but is authorized only 1. This compares to 31 required and 29 authorized in 1991**
- **The Army is critically short qualified cost analysts, while affordability is receiving increased emphasis**
- **The required and authorized number of operations research (1515 and FA 49) and cost analysts at TRADOC's ARCIC and Centers of Excellence is not consistent and needs to be reconciled**
- **The Army Modernization Strategy, published by G-8 on 23 April 2010, clearly states the need for skilled operations analysts in developing requirements, yet the Army analytic and requirements development communities are critically short skilled Operations Research/Systems Analysts (ORSA) and Cost Analysts**

Figure 23. More Cost and Operations Research Analysts Are Needed

While only 72% of the personnel required to perform the capabilities development process within TRADOC are authorized, only 56% (53% FA 49 and 58% 1515) of the required analysts are authorized. Compounding this problem, the fill of authorized military analysts is only 56%, meaning only 29% of the required military analysts are on hand.

AMSAA has a requirement for 15 military analysts but is authorized only 1. This compares to 31 required and 29 authorized in 1991. Forty percent of AMSAA's and TRAC's funding for civilian analysts is resourced through reimbursable work, often by PEOs and PMs. This will preclude both organizations from conducting the necessary tradeoff, cost-benefit, and AoA analyses and creates a perception of conflict of interest.

In the case of analysis of materiel systems, cost must be an independent variable and yet the Army has drastically reduced its cost analysis capability. This critical shortage was

highlighted in the Reno Report, *Reforming the Requirements and Resourcing Processes in Support of Army Institutional Adaptation*, but has not been acted on (Ref 238).

At a time when Army claims it is network-centric and cyber warfare is critical, the Signal CoE has only two 1515 and no FA 49 analysts required, but none authorized. The Intelligence CoE has two 1515 and two FA 49 analysts required, but only one FA 49 authorized. The required and authorized number of analysts differs by CoE from 0 to 22 required military and 1 to 43 required civilian analysts. The number authorized varies from 0 to 11 military and 0 to 23 civilian analysts. While the numbers should not necessarily be identical, no rationale could be found for the differences. Most Capability Development Integration Directorates (CDID) lack an adequate number of analysts to perform their mission and the inadequacy of personnel fill made the problem even worse. A consistent rationale would help determine the appropriate analytic capability necessary to perform the studies and analyses required within TRADOC. Cost analysts are essentially nonexistent within TRADOC.

- **There is wide spread customer, industry, employer and employee dissatisfaction with the AAC**
- **The Operating Force is critical of the AAC military for insufficient ‘greening’ and lack of experience with the current way the Army fights**
- **The acquisition workforce has been undervalued by Army**
 - Hardest hit include system engineering, quality assurance, contracting, cost estimating, ORSAs and military DASCs
 - The Army fails to exploit AAC member development through assignments to DARPA, NASA and National labs
 - The military acquisition workforce has declined by 19% since 1994, despite an increase of 149% in R&D and Procurement budgets
 - Only 38% of the uniformed acquisition workforce have engineering degrees
 - The Army is scheduled to receive 5,385 of the 20,000 acquisition billets directed by the SECDEF, of which 1,600 will be serving a contracting function
- **TRADOC Capability Managers (TCM) are inadequately resourced to be proper counterparts to their PEO/PM**
- **The Army lacks the database-informed processes and information systems necessary to have even the most basic understanding of the status and trends of acquisition workforce requirements, supply and qualifications**

Figure 24. Requirements and Acquisition Workforce is Under-Resourced and Undervalued

In many of our interviews – with industry leaders, operational commanders, some acquisition leaders and senior Department of the Army leadership – the panel noted a generalized dissatisfaction with the Army Acquisition Corps (AAC). The dissatisfaction did not appear to be directed at a specific PM, PEO or weapons area, but was more like “they are out of touch with the real world of Army operations”; “they don’t understand what’s happening to the defense industry”; “they are looking for a perfect, spec compliant solution to a problem I have today”; “I can’t wait ten years for a new ____.” The separation of the AAC from the rest of the Service following Goldwater-Nichols is widely seen as having contributed to the acquisition system’s lack of responsiveness to current operational needs.

From an industry perspective, too few PMs understand corporate finance and how industry is run, both of which are critical to understanding the incentives and disincentives the PM

has available to acquire the best results from industry. We found no evidence that DAU offers PM courses focusing on this issue. Compounding this problem, PMs often cannot turn to their contracting officers for insight because even contracting officers receive little education on this critical issue.

The dissatisfaction with the AAC now is compounded by nearly ten years of constant combat, irrelevance of many major weapons systems to the current Middle East/Central Asia Area of Operations and apparent delays in fielding relevant equipment to the forces in combat. There is also the sense that the AAC is out of touch with the real conflict and does not understand the way the Army now fights.

Conversely, Army leadership attention has been on force generation for the current fight and has undervalued and reduced acquisition and key acquisition support, while RDA budgets have increased by 149%.

- Hardest hit have been the personnel groups most useful to establish sound requirements and completing acquisition programs: ORSAs, systems engineers, contracting staffs, cost estimators, quality assurance and military DASCs. An important consequence is the loss of corporate memory and knowledge of best practices for the Materiel Solution Analysis Phase and SSEBs.

The DoD's Systems Engineering capability has been a regular source of concern for Congress, and has recently been highlighted as a source of concern by a National Defense Industry Association (NDIA) study (Ref 166). Other surveys of industry have highlighted concerns over the quality of program planning. That even the defense industry is expressing these concerns should raise a red flag.

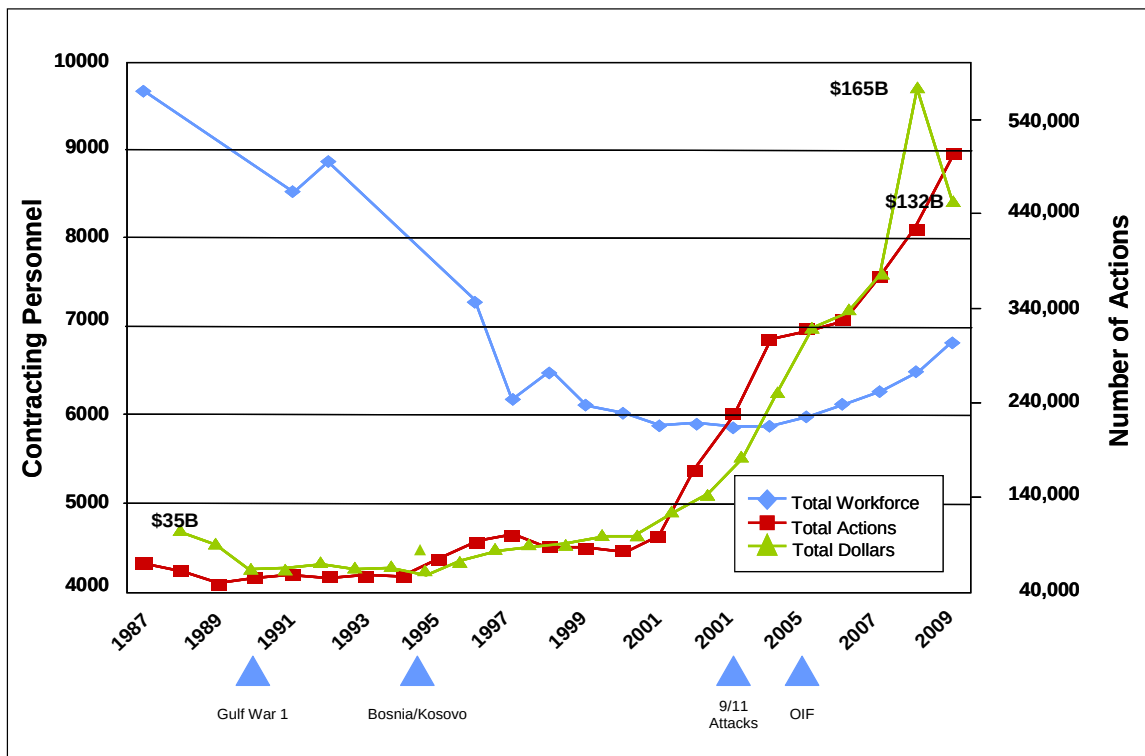
The NDIA study argued that the reduction in DoD's systems engineering capabilities following BRAC and various rounds of acquisition "reform" left DoD without sufficient knowledge to evaluate the quality of industry's proposals and decisions in ongoing programs. Given the perception that DoD lacked the capacity to evaluate the realism of proposals or the quality of ongoing systems engineering work, industry was presented with strong incentives to reduce their own investments in development planning systems engineering, and have subsequently lost capacity as well.

- Compared to the other Services, the Army is underrepresented in DARPA, NASA and the National Labs.
- The overall military acquisition workforce – the workforce crucial to articulating military relevance to contractors – has declined by 19% since 1994 despite the acquisition budget more than doubling.
- The Army is scheduled to receive 5,385 of the 20,000 acquisition billets directed by the Secretary of Defense (Ref 82). This is already eroding because of current and pending DoD budget reductions.

The contracting workforce will be substantially improved by the addition of 5,000+ billets resulting from the Gansler Commission's recommendations. However, the Army must address the shortfalls in other areas – particularly the shortfall in military DASCs; experienced systems engineers in the RDECs, in PEOs and PM offices, and analytic capability in TRADOC ARCIC, CoEs, TRAC and in AMSAA. In this high-tech, systems-integrated world, only 36% of PMs have engineering degrees. Six PEOs and nine Deputy PEOs of the 12 Army PEO organizations (including the Joint PEO for Chemical and Biological Defense) have engineering degrees. Only 38% of the uniformed Army acquisition workforce have engineering degrees.

TRADOC Capability Managers (TCM) are to provide a user perspective balance to AAC PMs. They should be operationally experienced and not members of the AAC. The Army Logistics University has a two-week resident Capabilities Development Course and there is an equivalent course at the Army Force Management School. The Army Logistics University course provides knowledge about capabilities development, JCIDS and ICDTs and is an appropriate course for TCMs. However, not all TCMs attend. Further, TCMs are often assigned a multitude of programs which limits their ability to properly interface with their PMs. For key ACAT I programs, a Colonel with operating force experience related to the appropriate capability need should be assigned as the TCM with only this program. This is often not the case today. Further TCMs are often funded by PEO/PMs, rather than with TRADOC mission funding, which, as a minimum, creates the perception of a conflict of interest,

Currently the Army lacks insight into how many systems engineers it needs, or even how many it currently has on hand (current coding implies an implausibly low 24). The DoD has only recently begun to track systems engineers (equivalent to the Systems Planning, Research, Development and Engineering–Program Systems Engineer (SPRDE-PSE) Defense Acquisition Workforce Improvement Act (DAWIA) category), and is currently undertaking a competency assessment of that DAWIA category. Refining the definitions for DAWIA categories and improving reporting compliance among relevant commands is an important step toward strategic, data-driven workforce management. Unfortunately the lack of historical data renders the goal of data-driven workforce decisions unobtainable in the short term (see Appendix B.3).



Ref 240

Figure 25. Army Contracting Workforce Has Declined Since 1987

Army contracting workload grew by 500% since 2000, contracting complexity increased, and government regulation burgeoned, but the contracting workforce only increased by 16%. As explained in the Gansler Commission report, a handful of military contracting officers with insufficient training shouldered the Army's contingency contracting mission, augmented heavily by the U.S. Air Force, which maintains a far larger corps of contracting officers for far fewer dollars obligated (Ref 73).

Starting in 2001 there was a rapid rise in service contracts. In FY2010, service contract expenditures were over \$55 billion (Ref 55). Contracting for services has been very diffuse, with no common standards or guidelines. Congress has mandated DoD to improve this situation (Ref 226). A good first step is the establishment of DASA(Services) within ASA(ALT). There is inadequate policy and guidance, along with education and training of the Army workforce who will contract for and manage service contracts. The Gansler Commission addressed the needs for expeditionary contracting, including the post-award management of services contracts by the Contracting Officer Representative (COR).

Notwithstanding the Gansler recommendations, the DAU has ineffective, short offerings for the education and training of personnel involved in services contracting.

Workforce decisions are largely made at the local organizational level. Rough DoD-wide acquisition workforce goals seem based on the use of 1998 as a benchmark. While in some respects this is a reasonable approach given the dearth of reliable historical data, it is not an acceptable long-term corporate strategy.

The ability of the Office of the ASA(ALT) (OASA(ALT)) and AMC to discipline the personnel requirements process is further undermined by subordinate organizations' ability to hire as many contractors as they have money for, regardless of validated requirements. While the ability to hire contractors is an important flexibility, recent Army efforts at developing systemic data on the size of the contractor workforce must play an important role in future total workforce shaping decisions.

The Army's Civilian Workforce Transformation (CWT) component of the Army Campaign Plan includes critical elements to making data-driven workforce decisions. The Army's Acquisition Workforce is much further ahead in the development of a career lifecycle management system than the civilian workforce at large, but several CWT goals remain relevant, including the integration of requirements determination, allocation and resourcing processes.

Currently OSD guidance has established acquisition workforce growth goals (supply). Developing greater insights into the changing workload (demand) of the acquisition workforce will only become more important as budget realities drive programmatic changes. Whereas the Army has continuously improved its data on the acquisition workforce, it lacks any clear metrics for evaluating workforce demand beyond locally generated requests. Ongoing competency reviews appear to be on track to establish appropriate criteria for evaluating the quality of individual acquisition workforce members. Unfortunately, there do not appear to be metrics for evaluating the quality of personnel being recruited into the Army Acquisition Workforce.

- **Counter to the guidance and intent of Goldwater-Nichols, Packard Commission and DA Pamphlet 70-3**
 - Army normally assigns experienced, more senior Project Managers at MS B, yet assigns junior, less qualified PMs to manage the pre-MS B activities when many of the critical decisions affecting program success are made
 - The Army sometimes assigns Colonel-level Project Managers responsibility for multiple Major Defense Acquisition Programs (MDAPs), then assigns less qualified LTC-level Product Managers to manage each MDAP
 - The grade and experience of PMs assigned to major programs are often low compared to the program priority, scope and risk, e.g., O-5 Product Manager for JAGM (~\$1.6B RDTE), O-4 Product Manager for Paladin PIM (~\$560M RDTE), O-6 Project Manager for GCV (\$7.6B in RDTE), etc.
- **PMs and PEOs have neither the capability nor the funding to manage post-fielding sustainment**
- **There is an experience drain due to personnel reductions and aging of the workforce, which has seriously depleted the pool of talent with proven experience in the establishment and conduct of SSEBs and SSACs, and management of complex programs**

Figure 26. Knowledge, Skills and Abilities Do Not Match Assignments

The issues facing acquisition managers are compounded when the Army fails to follow its own guidelines and the guidance and intent of previous reforms, for example:

- Choosing a Lieutenant Colonel (LTC) Product Manager in lieu of a more experienced Colonel (COL) Project Manager to initiate a large, complex project with substantial technical risk and lead it through Milestone B is shortsighted and inappropriate. Even though program funding may be low in this phase, important actions include: getting the program office staffed properly; establishing the correct acquisition strategy, including competition or sole source decisions; working with senior civilian department managers to establish high quality matrix support; assigning specific tasks to AMC and other supporting organizations; and managing the formative technology program through MS B. These actions are not appropriate for LTC-level product managers of major programs. The success or failure of an acquisition program may often be determined prior to assigning a COL-level Project Manager at MS B because

major decisions reflecting personnel and technology have already been made (see Figure 39).

- The Army has on occasion assigned COL-level Project Managers the responsibility for several Major Defense Acquisition Programs (MDAP) with a LTC-level Product Manager managing each. This can lead to the problems discussed above and is an apparent violation of the Goldwater-Nichols requirement that there be only one reporting level between an MDAP PM and his Service Acquisition Executive – Product Manager, to Project Manager, to PEO, to AAE is one layer of management too many from the MDAP Manager to the AAE (Ref 43). More importantly, it means major Army acquisition programs are not getting the leadership and management merited, particularly in the critical, formative years.
- These problems and challenges for less experienced product and project managers are compounded when these officers are assigned to manage multi-billion dollar, high-visibility projects such as the Joint Air to Ground Missile (JAGM) system. This joint Army-Navy program with an estimated total development cost of approximately \$1.6B is managed by an Army LTC. While this LTC is an extremely talented individual, there is a question as to his credibility with the Navy, OSD, and the Hill because of his rank. The Ground Combat Vehicle (GCV), the linchpin of future Army ground combat systems, with an estimated development cost of greater than \$7B, is managed by a Colonel. The M2 Bradley Fighting Vehicle development was managed by General Officer Program Managers. The Paladin Product Improvement, with a total development cost of approximately \$560M, is managed by a Major.

PM core competencies are being diluted by mission creep. An example of assigning responsibility without resources is the increase in responsibility for post-fielding support now being assigned to PMs. Sustainment is not a skill set prerequisite for existing PMs and they can only get the people and expertise to do life cycle sustainment by taking logisticians away from LCMCs that have and are performing a majority of that mission today – or by hiring outside contractors. PMs should be trained for and keep their expertise focused on setting up and managing programs through development and into sustained production. After initial fielding, the matrixed logistics personnel supporting the PM in his acquisition logistics role are better used in the LCMCs to sustain fielded systems.

Army Acquisition now has to cope with an experience drain because of past reductions in personnel and more than 20 years of Goldwater-Nichols interpretations that limit the inflow/outflow of personnel into the acquisition force and its supporting elements. Experienced engineers and managers are retiring, and the middle level that should replace them is not as robust and experienced in acquisition as in the past 20 years. This lack of experience in the workforce affects not only the PM offices and the management of ongoing programs, but also the supporting LCMCs, depleting the pool of talent and experience essential to supporting SSEBs and Source Selection Advisory Councils (SSAC).

- **30% to 60% of the funding for capability development (COEs and TCMs) is provided by the PEOs/PMs**
- **Approximately 40% of AMSAA and TRAC funding is provided by conducting analyses for which they are reimbursed, often by PEOs and PMs – as additional acquisition-related analytic tasks are required, neither organization has the necessary manpower to perform them**
- **AMSAA and TRAC have inadequate resources to conduct the required analyses of alternatives (AOAs) and have documented and requested \$20M annually to perform them**
- **Funding instability is often cited by industry and PMs as the major threat to meeting their program baseline schedule, cost and ultimately performance**
 - The Army fenced the funding for the 'Big 5' programs of the '70s, minimizing perturbations
 - USD(AT&L), 2006 QDR, 2006 DAPA Report, and FY2006 NDAA (HR 1815, Section 1004) recommended a "capital account" to fund ACAT ID baseline programs
 - Properly resourced upfront, Integrated Process and Product Development (IPPD) cost reduction measures will generate high life-cycle return on investment
 - Multi-year contracts for production also reduce instability

Figure 27. Funding Inadequate for Requirements Analysis and Sound Acquisition

While TRADOC is responsible for capabilities development, between 30% and 60% of the budget for TRADOC CoEs is funded by PEOs and PMs. A PEO stated that he paid TRADOC for the development of requirements. TCMs, who should represent the user to ensure that PEO/PM actions are consistent with user needs, are funded by PEOs and PMs. TRADOC's

base budget does not include the necessary funding for capabilities development. There is a clear perception that there is a conflict of interest.

Approximately 40% of both AMSAA's and TRAC's funding comes from reimbursement, often from PMs and PEOs, to conduct analyses on specific program issues. While these efforts are important, they are not the basic mission analyses required for capabilities development, DOTMLPF, tradeoff, AoA, and engineering analyses. This level of reimbursement precludes both organizations from having the flexibility to address critical acquisition-related analyses, particularly as the demand for them is increasing.

On 5 October 2010, AMSAA and TRAC documented the annual shortfall of resources since 2003 to perform materiel acquisition analyses, particularly in support of analyses of alternatives. These funds have been obtained through ad hoc, unfunded requirements money in the year of execution and also from PEOs and PMs. AMSAA and TRAC documented an annual requirement of \$10M each above current mission funding to cover the historically recurring resource shortfall for acquisition analyses. They also recommended the establishment of a centrally managed fund for Army AoAs and associated materiel acquisition analyses. This is particularly critical as the demand for AoAs has increased.

The Army has a propensity to churn priorities and cancel programs that run into difficulties on the assumption that the new program will not run into difficulties...and they inevitably do. Unless the requirement is no longer valid or the issues are catastrophic and nonrecoverable, sometimes it is wiser to stick with the program you have and work out the problems. Churning of acquisition program priorities and funding profiles creates costly instability and damage to program baselines, and erodes confidence and trust in the Army Big A community.

During our interviews, funding instability was cited by many of the PMs and PEOs, as well as by industry contractors, as one of the major threats to meeting their program baseline cost, schedule and performance. The annual budget exercise within the Army and in the other Services often creates the need for 'bill payers,' and sometimes ongoing programs are taxed. During our fact gathering, three potential actions were cited to mitigate this problem.

- In the 1970s, Army top leadership 'fenced' the funding for the "Big 5," thereby immunizing them from the bill payer exercise. The Under Secretary of Defense,

Acquisition, Technology and Logistics (USD (AT&L)), the 2006 Quadrennial Defense Report (QDR) (Ref 87), the 2006 Defense Acquisition Performance Assessment Report (Ref 66) and Section 1004 of the FY2006 National Defense Authorization Act (Ref 225) all recommended a “capital account” to fund ACAT ID baseline programs. In essence, this would “fence” the funding for approved ACAT ID programs. DoD initiated a pilot program to explore the use of capital accounts to stabilize funding and requirements for selected major acquisition programs as part of the DoD push for risk-informed investment strategies. From concept definition through LRIP (up to 5 years), the pilot programs were to meet the agreed-upon semi-annual cost, schedule and performance metrics. Program funding would not be increased/decreased in program or budget development without prior approval from the USD(Comptroller) and USD(AT&L). Changes to performance requirements must be approved by the Vice Chairman of the Joint Chiefs of Staff and USD(AT&L). In FY2008, the Services nominated the following pilot programs: Army - General Fund Enterprise Business System (GFEBS); Air Force – Combat Search & Rescue Block 0 (CSAR-X); and Navy – Joint High Speed Vessel (JHSV).

- Integrated Product and Process Development (IPPD) has been shown to improve program design development, production and sustainment, as well as reduce life cycle costs. This stems from considering producibility and initiatives like Six Sigma during technology development and EMD. By following an evolutionary development strategy and incrementally improving the system over time, technical, schedule and cost risks are reduced. Unfortunately, when programs are planned, programmed, and budgeted, there is considerable pressure to either not include or under-resource these initiatives because funds are needed to meet current need and the program stability and life cycle cost savings downstream.
- The Army has had good success in reducing system and subsystem costs and maintaining funding stability by multi-year contracting; however, most of the recent multi-year buys have been for small items and upgrades to existing systems. Documented savings for multi-year contracts range from approximately \$75K per tank (3%) for the M1A2 system enhancement program (SEP), to 13% for 120mm tank training ammunition, to 27% for a recent TOW missile buy.

- **For Army systems, O&S costs are ~15 times development costs; yet, the Army consistently under-resources the pre-MS C effort that would reduce O&S costs**
- **Correctly forecasting and funding OMA, especially with the pending end of the Iraq and Afghanistan wartime supplemental budgets, is critical to avoid drastic cuts to weapon systems like those that occurred following Operation Desert Storm**
- **The Army Modernization Plan, 23 April 2010, is:**
 - Thorough and detailed
 - Fully funded in terms of the Army's 2011 budget request and Future Years Defense Program (FYDP)
 - Optimistic, given likely DoD and Army budget reductions in the next 3-7 years.

Figure 28. Analysis, Planning and Management of Life Cycle O&S Cost Are Inadequate

"Of the \$100 billion identified by the military departments, approximately \$28 billion – will be used over the next five years by the Army, Air Force, Navy and Marine Corps to deal with higher than expected operating costs..."

"Frankly, using the savings in this way was not my original intent or preference, but we have little choice but to deal with these so-called 'must pay' bills - and better to confront them honestly now than through raiding investment accounts later."

– Secretary of Defense Robert Gates, January 6, 2011 (Ref 108)

The Army needs to find a way to better forecast O&S costs and invest upfront in smart strategies to reduce life cycle costs. Otherwise 'resource informed requirements' are not possible. This will become even more important as the Iraq and Afghanistan Supplementals expire. The Army historically has had a propensity to reduce acquisition funding in order to fund O&M funding shortfalls, which year in and year out are poorly and under-forecast. This component of funding instability will only get worse with the expiration of current supplemental budgeting to fund the war. The Army must improve its O&S cost forecasting, planning, POM and budgeting and design lower ownership costs into new systems.

A recent Government Accountability Office (GAO) report (Ref 309) stated:

"DoD lacks key information needed to effectively manage and reduce O&S costs for most of the weapon systems GAO reviewed—including life-cycle O&S cost estimates and complete historical data on actual O&S costs. The services did not have life-cycle O&S cost estimates developed at the production milestone for five of the seven aviation systems GAO reviewed, and current DoD acquisition and cost-estimating guidance does not specifically address retaining these estimates. Also, the services' information systems designated for collecting data on actual O&S costs were incomplete, with the Army's system having the greatest limitations on available cost data. Without historic cost estimates and complete data on actual O&S costs, DoD officials do not have important information necessary for analyzing the rate of O&S cost growth for major systems, identifying cost drivers, and developing plans for managing and controlling these costs. At a time when the nation faces fiscal challenges, and defense budgets may become tighter, the lack of this key information hinders sound weapon system program management and decision making in an area of high costs to the federal government."

As new technologies are incorporated in systems, new cost relationships and cost estimating tools need to be developed.

The 2010 Army Modernization Plan is very thorough. It calls for three major areas of effort:

- Develop and field new capabilities, leveraging technologies harvested from the Army's Science and Technology program.
- Continuously modernize equipment to meet needs through upgrades.
- Conduct responsible drawdown and reset of equipment.

There is an extensive list of programs to be pursued within all three of the major areas of effort. The Army's 2011 budget request of \$31.7B and the Army's Future Years Defense Program (FYDP) submission fund the entire list.

Unfortunately, there is no clear analysis of priorities among the extensive program list, given the likelihood that the DoD and Army budgets and FYDP may be reduced, perhaps substantially, over the FYDP period.

- **The Army lacks constructive models and simulations that represent the human, social and behavioral aspects of stability operations and irregular warfare involving paramilitary forces and nonmilitary combatants who can influence military operations or to analyze the impact of degrading C3 networks**
 - TRAC has developed the Cultural Geography Model as an initial means to assess this environment
 - Scenarios and data representing these types of conflicts are not adequate
 - These weaknesses preclude the Army from conducting credible analyses of materiel in these operational environments
- **DOD is sponsoring a Human Social Culture Behavior (HSCB) Modeling Program to conduct research necessary to develop these tools, and DA is supporting collection and analysis of stability operations and irregular warfare (IW) data and IW modeling incorporating social and behavioral science theories**
- **Modern materiel cost estimating relationships and associated tools to support development, production, and O&S cost estimates are needed by the Army**
- **Analytic tools are needed to conduct credible capability portfolio reviews and trade-offs across portfolios to support POM and budget decisions**

Figure 29. Analytic Tools are Inadequate for Informed Requirements and Resource Decisions

The Army has a series of engineering models used by AMC and force-on-force models used by TRADOC to conduct analyses of proposed systems in major combat operations (MCO). These models are not adequate, however, to analyze systems in stability operations and irregular warfare involving paramilitary forces and large numbers of noncombatants who can influence military operations. The Army also lacks adequate models to analyze the impact of degrading C3 networks, particularly in these environments. This deficiency is caused in part by social scientists historically not being involved in the development of Army warfighting models.

The Army also lacks scenarios in which Army systems are operating in these types of environments. Compounding this problem is the fact that the Army has not collected and archived the data associated with such operations, so even after appropriate models are developed, the necessary data needed to feed them is not available. In an Irregular Warfare Analysis and Modeling Briefing to the VCSA on 28 April 2010, the findings of a gap assessment of DoD's analytic capability relevant to the irregular warfare (IW) operating

environment reported that 35 gaps exist within 56 areas of required analytic capabilities with 34 caused or compounded by a lack of credible IW data and 20 pertaining to social science (lack of knowledge, data and algorithms). As of the April 2010 briefing, one gap had been fully funded and six had been partially funded. On 1 July 2010, a follow-on briefing was presented to the VCSA requesting \$15.8M annually over the POM, with \$9.3 for data and \$6.5 for model development. This request was approved.

This lack of models and simulations with the proper underlying algorithms, scenarios, and relevant data precludes the Army from conducting credible analyses of materiel in the operational environment in which it will be used to determine capability shortfalls and to assess and justify new materiel.

Recognizing this deficiency, TRAC has developed the Cultural Geography Model as an initial means to assess this environment. DoD is sponsoring a Human Social Culture Behavior (HSCB) Modeling Program to conduct research necessary to develop these tools and, as mentioned above, DA is supporting collection and analysis of IW data and IW modeling incorporating social and behavioral science theories.

With the reduction in the number and quality of cost analysts, the Army has also failed to develop new cost-estimating relationships and the associated tools necessary to provide accurate development, production and O&S cost estimates for new materiel programs. With the introduction of new technologies and the increased use of computers, software and sensors in our systems, the Army lacks the new and current cost relationships necessary to make credible cost estimates. An example is the dependence upon weight as the key driver in estimating costs for the new Ground Combat Vehicle.

The G-8 does not have any quantitative analytic tool to assess the capabilities and costs of existing and proposed systems within portfolios. The VCSA lacks the same capability to support the conduct of capability portfolio reviews. This inhibits the ability to quantitatively assess the relative value (cost/benefit) of the components of a portfolio and to assess the relative value of a new, proposed system in that portfolio. Even more critical, both the G-8 and the VCSA lack analytic tools to aid in examining capabilities and costs among capability portfolios. Without such tools, the Army does not have the capability to properly assess systems that contribute to multiple portfolios and to examine the comparative value of different portfolios in providing the Army its essential warfighting capability. Such tools are

necessary to conduct credible capability portfolio reviews and, moreover, to conduct tradeoffs among portfolios to support POM and budget decisions. The ultimate capability of such tools is to examine how to better allocate resources among different mixes of portfolios. The existence of such tools would greatly enhance the Army's ability to justify modernization investment strategies with OSD and the Congress.

III. RECOMMENDATIONS

- **Make Requirements Process Collaborative and Timely**
- **Risk Management– Not Risk Aversion**
- **Align Organizations and Accountability**
- **Provide Adequate Requirements and Acquisition Resources**

Figure 30. Our Recommendations Fall into Four Categories

III.1 REQUIREMENTS DEVELOPMENT

- **A TRADOC-led Integrated Capabilities Development Team (ICDT) with personnel from the Army Staff and Secretariat, AMC, ATEC and other Army commands should collaboratively develop requirements documents for AROC approval:**
 - Amend AR 71-9 to give the TRADOC CG the authority to task non-TRADOC organizations for ICDT participation
 - ICDT representatives must have the authority to speak for and commit their organizations
- **For key ACAT I programs, establish a Special Task Force (STF), chartered by either the CSA or SecArmy, that is:**
 - Co-chaired by a TRADOC MG and an acquisition GO/SES technically qualified for the system pursued
 - Conducted off-site, outside the Washington, DC area, for a finite period of performance
 - Convened as necessary to prepare for the MS A and B decisions
 - Organized and populated with experienced, qualified talent, from the Army Secretariat, ARSTAFF, TRADOC, AMC, ATEC and other Army Commands with the authority to commit their organizations – Invite members of the JCS, DOT&E and OUSD(AT&L) as appropriate
 - Tasked to collaboratively develop and provide to AAE, AMC and TRADOC a comprehensive, consistent set of requirements, acquisition milestone decision products and source selection documents
 - Used to draft RFP and assess comments received
 - Prepared to provide some STF members to serve on the SSEB or SSAC

Figure 31. Requirements Development Must Be Collaborative and Consistent

Once TRADOC has determined that a materiel solution is needed to satisfy a gap derived from a Capabilities-Based Assessment (CBA), TRADOC should establish and lead an Integrated Capabilities Development Team (ICDT) with mandatory participation of personnel from the appropriate organizations. This team should develop, through tradeoff analyses and coordination, a fully supported, resource informed materiel requirement document ready for AROC approval.

- AR 71-9 should be amended to give the TRADOC commander the authority to task rather than “invite” participation by the Secretariat (ASA(ALT), DASA(Cost and Economics), ARSTAFF (G-1, G-3/5/7, G-8) and other Army Commands (AMC, ATEC)

on ICDTs with the authority to speak for and commit their organizations. Include an appendix with the role and responsibility of each of the participating organizations. Prior to MS A, G-1 MANPRINT and ARL Human Resources Engineering Directorate (HRED) should participate on the ICDT to ensure that human performance requirements are identified and MANPRINT metrics are included in the Systems Engineering Plan. MANPRINT factors (manpower, personnel, training, human factors, safety, soldier/system survivability, and health hazards) should be considered and included in the AoA. This early consideration of MANPRINT requirements will reduce, if not eliminate, the current serious implications in system development.

While an ICDT is adequate for the development of requirement documents for most programs, future key ACAT I programs should be provided an STF chartered by either the Chief of Staff of the Army or the Secretary of the Army, which is:

- Co-chaired by a TRADOC MG and an acquisition GO/SES technically qualified for the system pursued
- Conducted off-site outside the Washington, D.C., area, for a finite period of performance, and reconvened as necessary to prepare for the MS A and B decisions
- Organized and populated with experienced, qualified personnel from the JCS (J-8), Secretariat (ASA(ALT) and DASA(CE)), ARSTAFF (G-1, G-3/5/7, G-8), and other Army Commands (AMC, ATEC) to address requirements development; threat; cost/benefit analysis; technology, systems engineering, life cycle sustainment and testing; program management requirements; costs; and contracting. STF members must have the authority to speak for their parent organization, as well as provide their parent organization's approval of the work product.
- Tasked to produce a coherent, consistent and comprehensive set of products needed to support the upcoming Milestone Decision to include but not be limited to: resource constrained ICD/CDD requirement and modernization plan; Acquisition Strategy with KPPs and risk management decision criteria; TEMP; LCSP; tradeoff analyses to include AoA; baseline cost estimate; recommended MDEP; draft acquisition plan; and draft RFP

- Following release of the Draft RFP, the STF will assess comments received and following release of the final RFP, some STF members may serve on the SSEB or the SSAC.

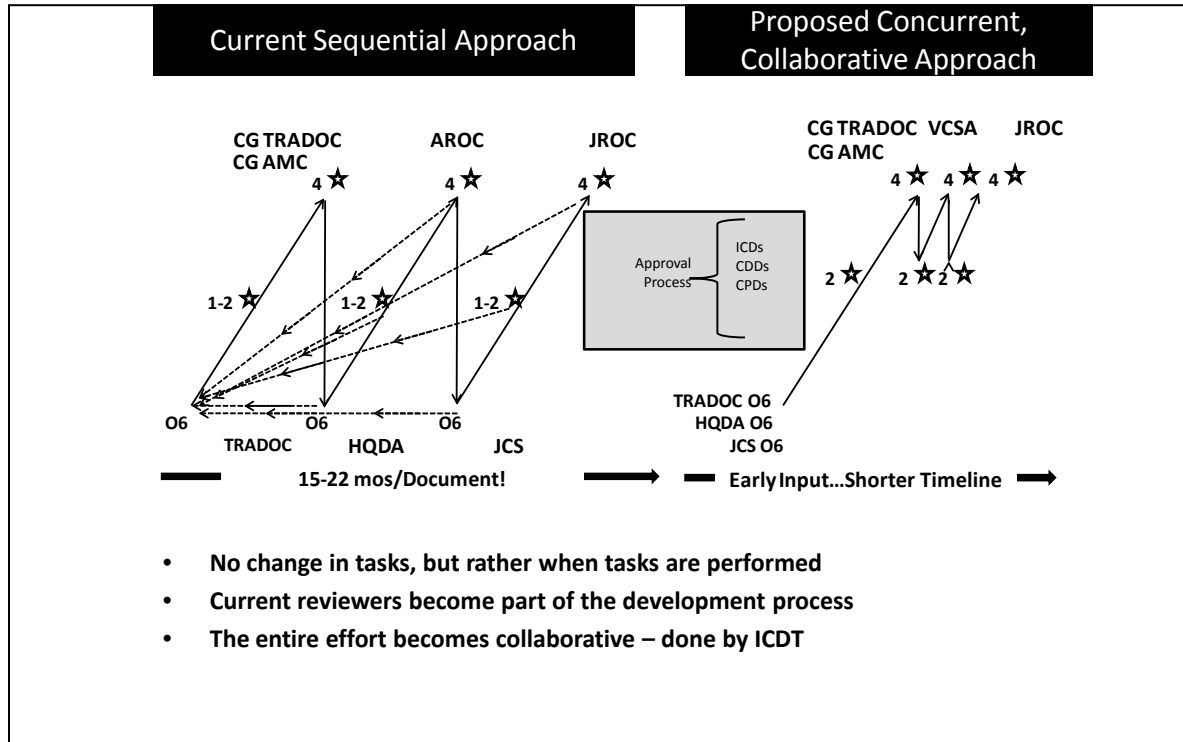


Figure 32. Make the Requirements Process Concurrent and Collaborative

As was shown in Figure 14, the current implementation of the Joint Capabilities Integration Development System is a sequential, heel-to-toe, non-collaborative and saw-tooth requirements process; executed by TRADOC, repeated by the DA staff, and repeated by the Joint Staff for ACAT I and special interest programs. Going through two reviews at both DA and JCS for ACAT I programs, the requirement document is repeatedly returned to TRADOC for reconciliation as questions and issues are raised.

Those organizations, which currently review the requirement document, should participate in its development as members of the ICDT. These participants must have the authority to speak for their organizations. Questions and issues must be raised and resolved during the development of the requirement and not after it has been developed and approved by CG TRADOC.

This concurrent, collaborative requirement development would not change the tasks to be performed, but would change when they are accomplished. Hence, when the document is submitted, it should be ready for approval since the reviewers were part of its development. This changes the process from a sequential **quality control** process to a collaborative, concurrent **quality assurance** process. The result would be better requirements developed in a timely manner.

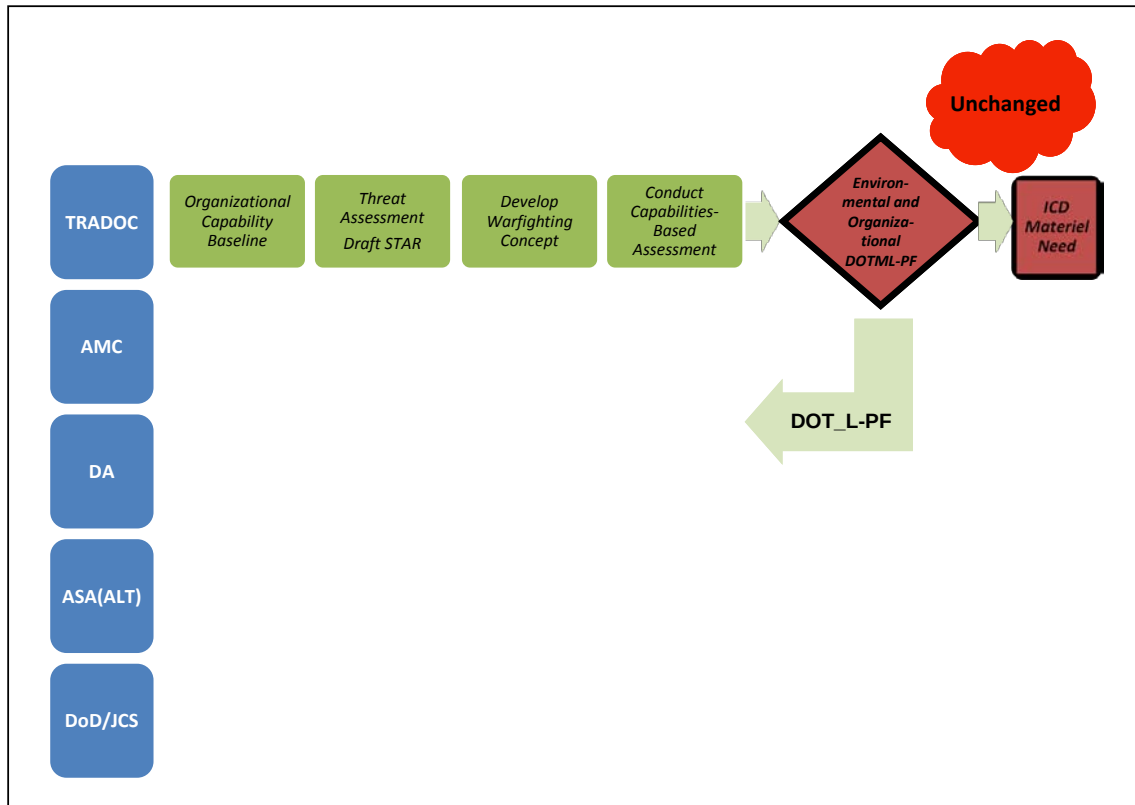


Figure 33. Make Requirements Process Collaborative and Timely – Traditional Requirements Development and Approval Process

TRADOC currently has organization-based capability baselines. As the threat changes and/or when a new warfighting concept is developed, a CBA is conducted to determine if the Army has any deficiencies or gaps in its ability to accomplish this capability. These unfilled needs are then assessed with a DOTMLPF filter to determine if the need can be satisfied by other than a materiel solution since a materiel solution is often the most costly and time-consuming alternative. If the need can only be filled by a materiel solution, TRADOC develops an Initial Capabilities Document (ICD) describing the operational need; i.e., what capability needs to be developed. This process does not need to be changed.

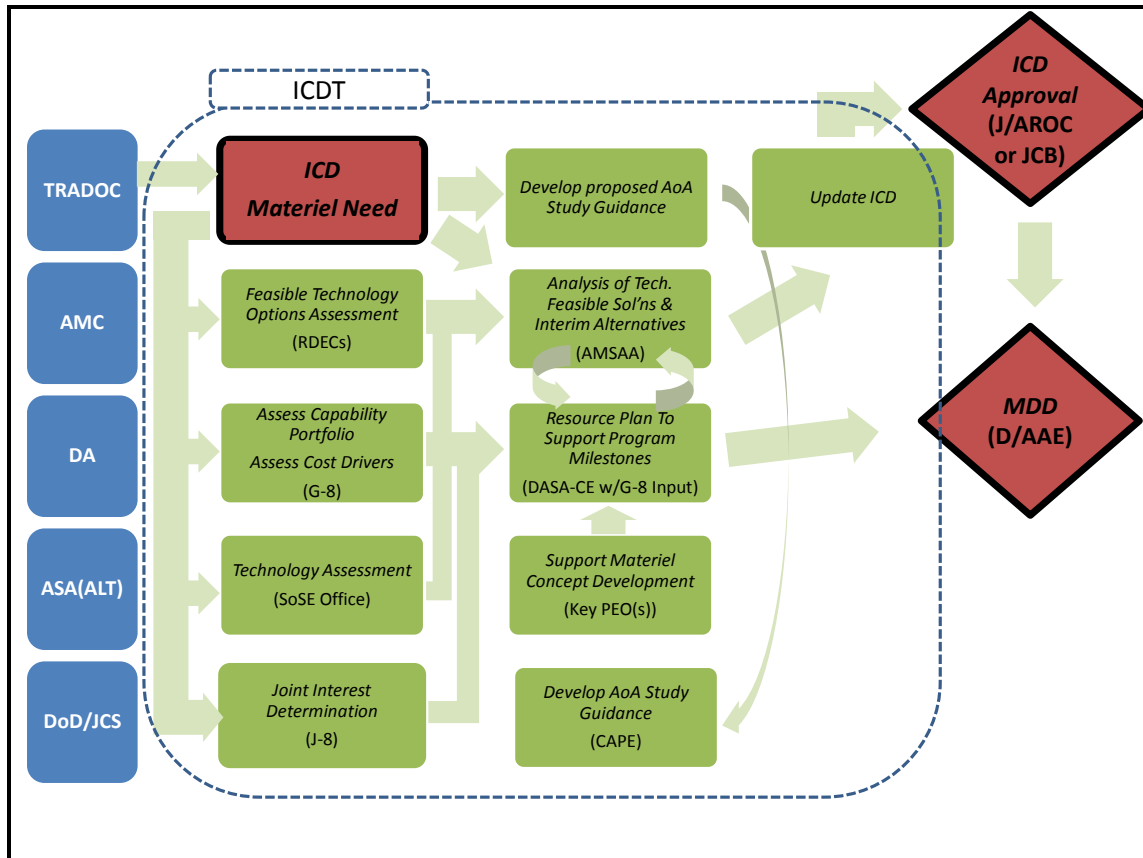


Figure 34. Make Requirements Process Collaborative and Timely – ICD to MDD

As was shown in Figure 14, the current requirements process is saw-toothed and sequential rather than done concurrently in a collaborative process. As a result, the current process takes an average of 15 months to 22 months to obtain an approved ICD. After approval by the 4-Star TRADOC commander, it can, and often is, returned by HQDA to resolve issues or questions that could have been surfaced and resolved during the initial development of the ICD in TRADOC. Again, JCS and OSD often have had the ICD related to ACAT I and special-interest items returned to TRADOC after having been approved by the 4-Star VCSA.

Preparation for a materiel development decision must be collaborative and concurrent. Once TRADOC determines that a materiel need exists (ICD), this need should be compared to the capabilities in the Army's associated portfolio by the G-8 and initial affordability guidance regarding the availability of funds for such a solution should be provided.

ASA(ALT) and the appropriate RDEC and AMSAA should assess the availability and maturity of technologies that feasibly might be appropriate in developing a solution to the need established in the ICD.

DASA (CE) and G-8 should develop a resource plan outlining the funds needed and available for the development of a materiel solution.

Proposed study guidance for the analysis of alternatives should be prepared by TRADOC and forwarded to CAPE in OSD where the AoA study guidance is developed.

The J-8, as the JCS gatekeeper, determines those systems that are of joint interest and therefore require JCS staffing. Those designated as 'JROC interest' require JROC validation and approval. Those ACAT II and below systems designated 'Joint Capabilities Board (JCB) interest' require JCB validation and approval.

TRADOC must assess these concurrent and collaborative actions, the guidance on cost and the analysis of applicable technology maturity, and collaboratively update the ICD – precluding the need for repeated questioning and challenging at HQDA and JCS. The updated ICD would be forwarded to the AROC for approval, and it and the resource plan should be submitted to the acquisition authority for the decision to initiate a development program (MDD).

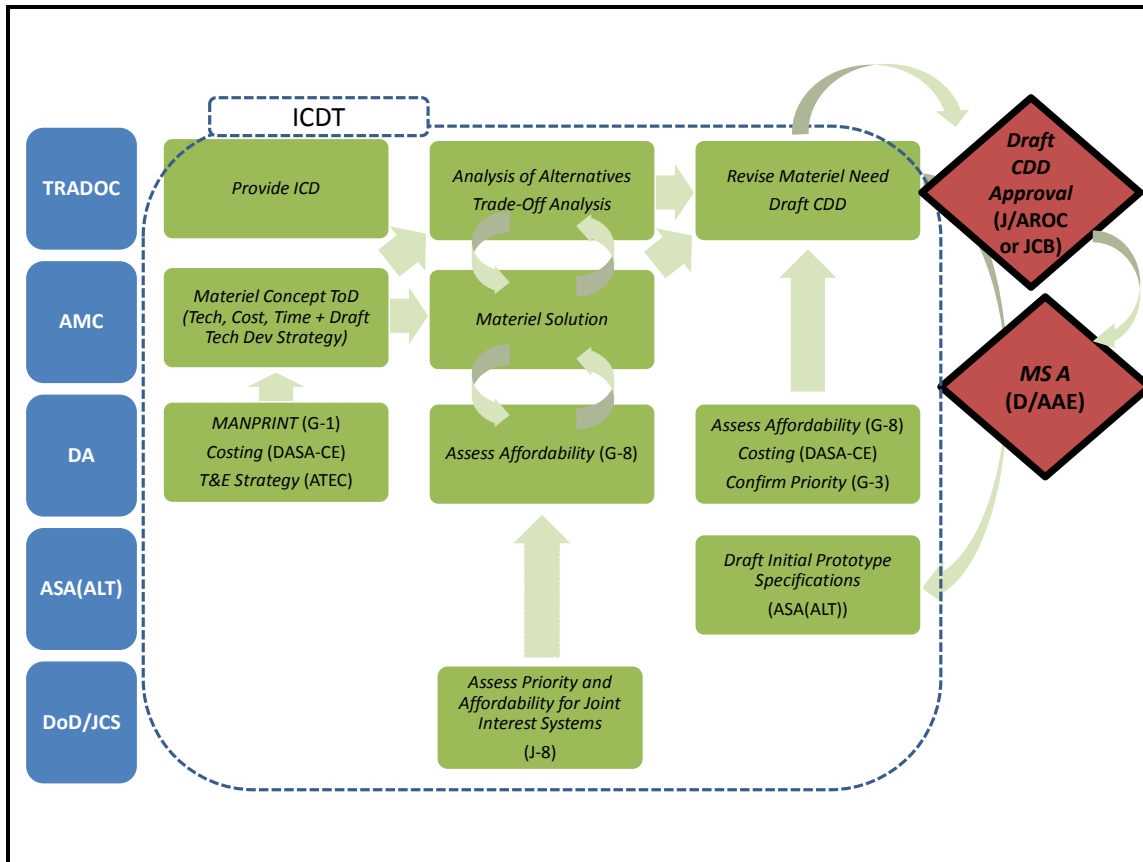


Figure 35. Make Requirements Process Collaborative and Timely – MDD to MS A

Once a materiel development decision is made by the acquisition executive, TRADOC establishes the ICDT. Our proposal provides TRADOC the authority to have AMC, G-1, G-3/5/7, G-8, DASA-CE, ATEC, and ASA(ALT) participate in the requirements development. The interaction between AMC and TRADOC should occur collaboratively rather than with completed products being passed between organizations, as sometimes occurs today. As AMC is developing the materiel solution, G-1 MANPRINT and ARL HRED develop human performance requirements and MANPRINT metrics for the Systems Engineering Plan. They also provide MANPRINT considerations for inclusion in the AoA; DASA(CE) and G-8 provide an initial cost estimate and appropriate cost drivers; and ATEC provides initial testing requirements. The materiel solution is analyzed with AMSAA's engineering models, and TRADOC (TRAC) conducts tradeoff analyses. G-3 confirms priority and G-8 confirms affordability.

The tasks and who performs the tasks remain the same. However, when the tasks are performed changes and the degree of collaboration is significantly increased by having a

team (ICDT) develop the necessary products. Organizations outside TRADOC and AMC have a responsibility to review requirement documents and make sure that they are consistent with the priorities and constraints of their organization. Today those reviews are performed after documents are developed, with questions and challenges being sent back to the originators of the requirement documents. These organizations would participate as members of the ICDT with representatives having the authority to speak for their organization so that the priorities and constraints are addressed and incorporated in the original document. This participation would be required, not be by 'invitation'. The result of this change will be better requirement documents produced and approved in significantly less time.

The result of the AoA, with MANPRINT and testing considerations, and confirmed priority and affordability, is an approved draft CDD ready for a MS A decision at HQDA.

J-8 should participate for JROC interest and JCB interest systems since they require JROC or JCB validation and approval.

Since a MS A decision will result in contracting for prototype development, AMC would develop the specifications for the contract.

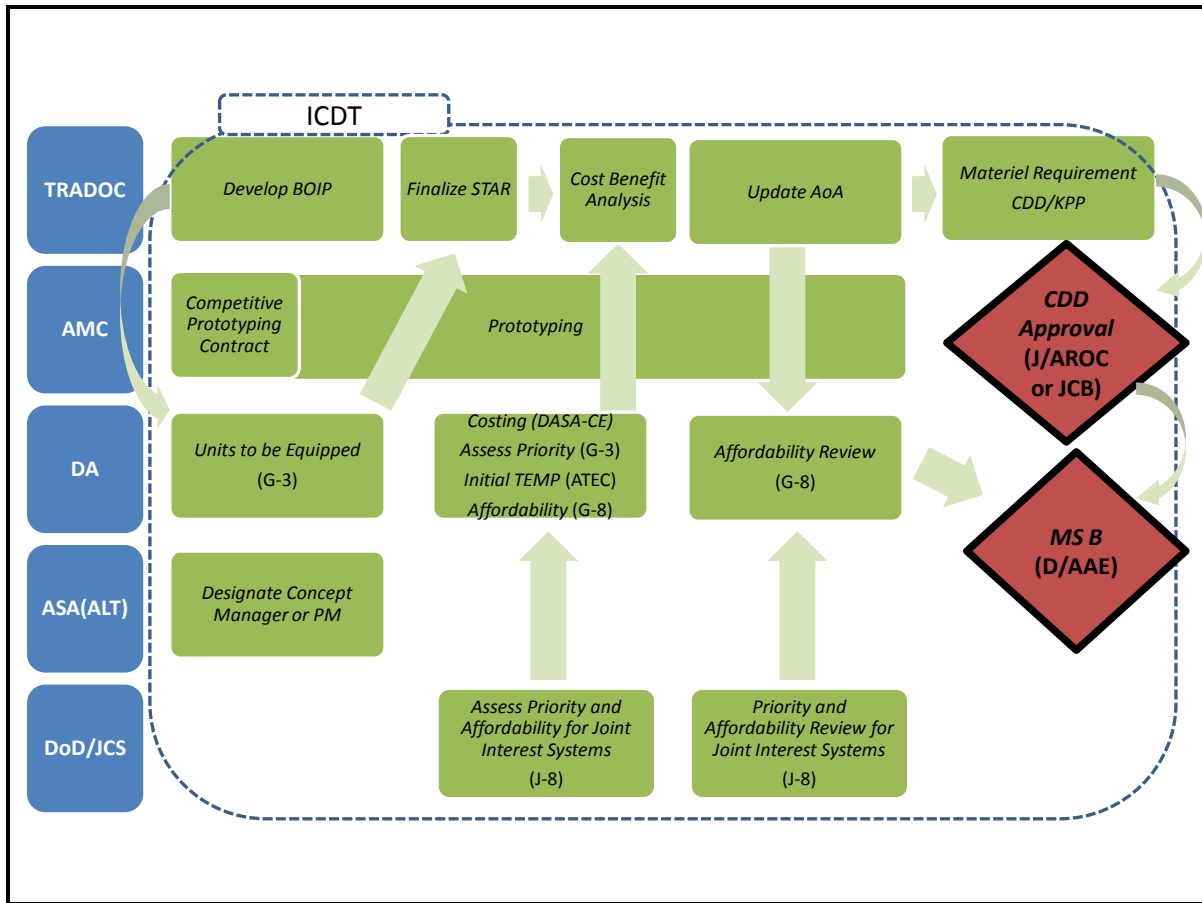


Figure 36. Make Requirements Process Collaborative and Timely – MS A to MS B

Following MS A approval, the Technology Development Phase begins and includes: technology risk reduction; determination and maturation of an appropriate set of technologies to integrate into the full system; demonstration of critical technology elements on prototypes; complete preliminary design; identification of an affordable program or increment of military-useful capability; demonstration that technology is examined in relevant environments; identification and assessment of manufacturing risks; and provision for competing teams for prototyping at the component, subsystem and maybe even system level prior to or through MS B. Some of the key products of this phase are: System Threat Assessment, validated CDD, KPPs, Acquisition Strategy, System Performance Specification, Source Selection Plan and RFP.

Once the MS A decision has been made, AMC prepares the contract for competitive prototype development. Concurrently, TRADOC determines the basis of issue for the system (how many of each type of unit should be provided) and G-3 determines which units should

be equipped (how many units should be provided with the system). This establishes the quantity to be purchased by increment. The subsequent affordability review uses the quantity to be purchased by increment (today's equivalent of an Army acquisition objective) to assess affordability of the program. TRADOC finalizes the system threat assessment report (STAR) and conducts a cost benefit analysis examining the cost of the system in relation to its operational contribution on the battlefield. With the results of the cost-benefit analysis, the knowledge gained by the competitive prototyping, and the cost input from DASA(CE) for the system and G-8 for the program, the analysis of alternatives is updated. This interactive, collaborative process can result in modifications to the requirement. If the stated capability can only be met with immature, very expensive technologies, the issue can be resolved as to whether a modification of the requirement would provide an acceptable, timely, and still needed enhancement. Further, if the system cost is not deemed affordable, again the issue can be resolved if a modification of requirements still provides an improved capability and if the initial system can be designed so that added enhancements can be added later as improved technologies become available. Designing the system with the necessary growth capacity is essential in these cases. A limited number of KPPs and KSAs, with their threshold and objective values to enable developer/contractor tradeoffs, should be established. The result of this process should be a requirement document (CDD) that will provide a meaningful capability and is both achievable and affordable. These issues need to be resolved in the development of the CDD and not through staffing of the CDD after it has been developed.

J-8 should participate for JROC interest and JCB interest systems since they require JROC or JCB validation and approval.

After MS A, and certainly by MS B, a PM should be assigned. Prior to assigning a PM, a Concept Manager from the RDEC Directorate of Advanced Systems should be assigned.

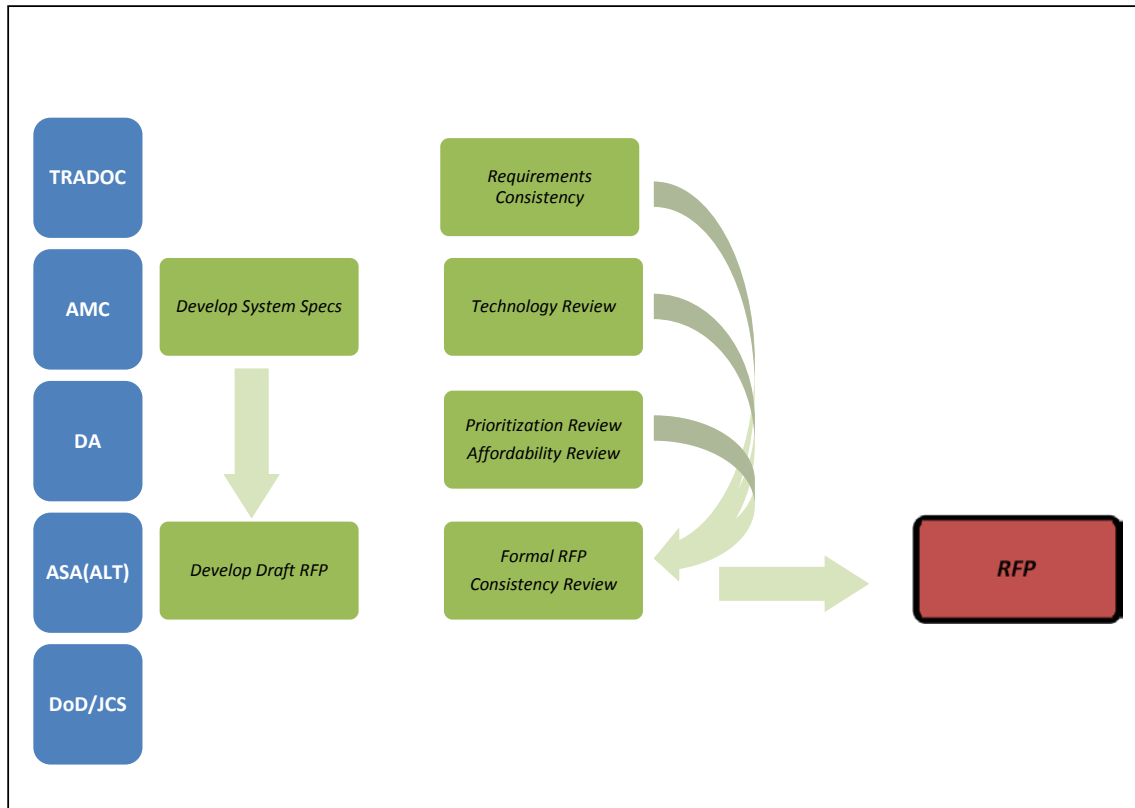


Figure 37. Make Requirements Process Collaborative and Timely – MS A and MS B to RFP

After MS A, a contract needs to be awarded for the competitive development of prototypes, and after MS B, a contract needs to be awarded for engineering and manufacturing development. In order to award these contracts, the PM prepares the draft RFP, but again the process of producing the RFP should be collaborative and concurrent with involvement by TRADOC to insure consistency with the requirement, with AMC for consistency with the previous technology assessments, and with the G-1, G-3/5/7, and G-8 to insure consistency with previous MANPRINT, priority, and cost estimates. These reviews should not be following the development of the RFP, but be part of that development.

- **Reduce the current practice of serial (saw-tooth) TRADOC-Army-Joint staffing and approval of requirements, acquisition and testing documents**
- **CSA recommend JCS terminate the current JCIDS process**
or
Require collaboration by J-8 and appropriate Joint Staff with the Army during the requirements development process
- **Institutionalize rapid acquisition in policy guidelines and amend AR 71-9 to support rapid acquisition in response to ONS from COCOMs during quiescent periods**
- **Request rapid acquisition discretionary funding for ONS to support COCOMs during such periods**
- **Synchronize TRADOC and Army requirements approval, MDD, MS A and MS B decisions to align with the DA POM and budget development schedules**

Figure 38. Make Acquisition More Timely

The development of requirements must be done in a concurrent, collaborative process by the capabilities development, resource, acquisition and testing organizations. This process, led by TRADOC, must involve representatives with the authority to speak for and commit their organizations, from the G-1, G-3/5/7, G-8, ASA(ALT), DASA(CE), AMC, ATEC and other affected Army commands. This process should be performed by ICDTs, or by STFs for key ACAT I systems. This will drastically reduce, if not eliminate, the return of documents to TRADOC to resolve issues and answer questions. Participation by appropriate JCS and OSD staff should be requested.

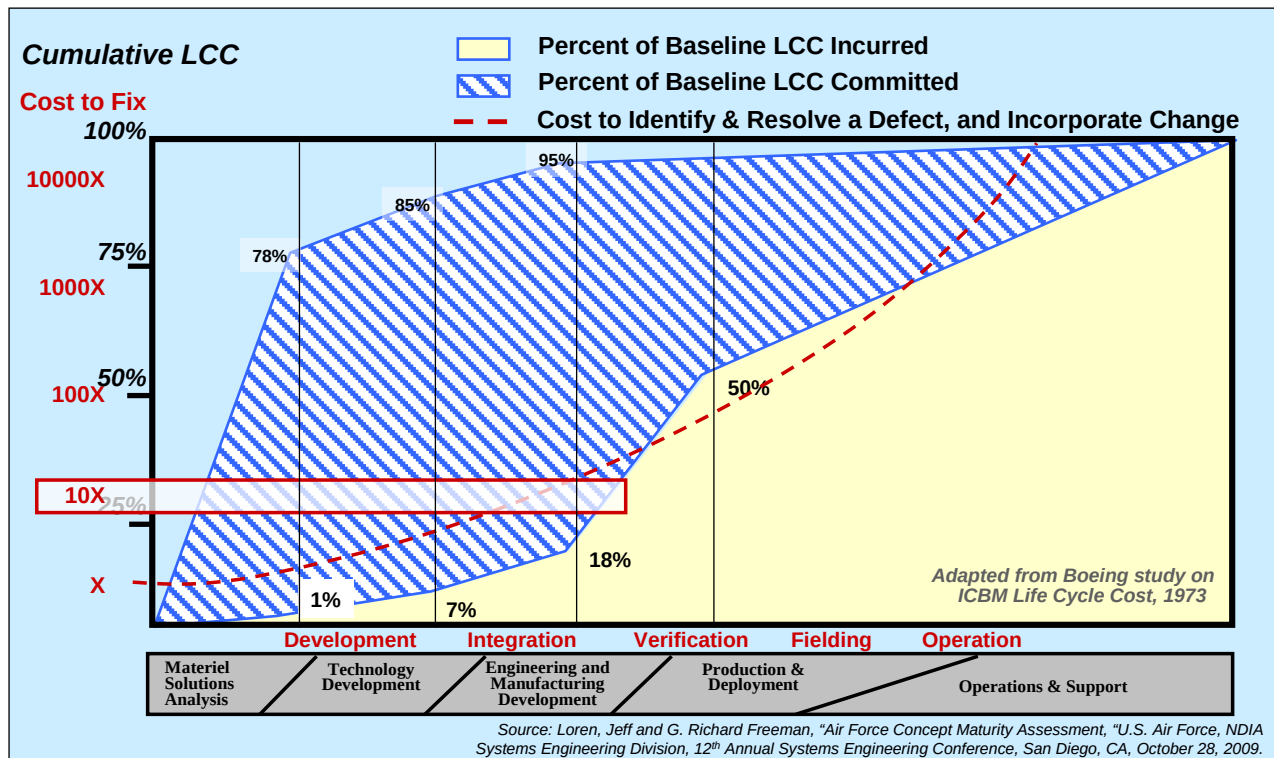
The current saw-tooth (JCIDS) process is taking 15-22 months for approval. Part of this time is being consumed within JCS and OSD. Requirement reviewers at this level need to participate in the development to reduce or eliminate that staffing time. GAO and others have been critical of the slow, layered JCIDS process. It is recommended that the Chief of Staff of the Army (CSA) request participation by appropriate JCS and OSD staff in requirements development. If not, the current process is not aiding in the establishment of requirements and should be eliminated.

To enable the continuation of support to operational commanders in providing materiel to fill urgent needs, policy should be developed and promulgated in AR 71-9 to continue rapid acquisition in quiescent periods. This will require concurrence in OSD and the Congress.

Rapid Acquisition is only possible when 'uncolored' funds are available. DA should solicit support from OSD and the Congress to provide such funds. DA should develop a rigorous set of guidelines and criteria that would be followed by the Army in executing Rapid Acquisition projects.

Acquisition decision points (MDD, MS A and MS B) establish resource requirements for materiel development. When these decisions are not synchronized with the Army's POM and budget cycles, the related program can be delayed for at least a year. This is particularly true for MDD when the necessary resources need to be identified in the POM. TRADOC needs to develop and the DA staff need to approve requirement documents to be available for Milestone decisions, and these Milestone decisions need to be scheduled to align with the POM and budget cycles.

III.2 RISK MANAGEMENT NOT RISK AVERSION



Ref 144

Figure 39. Early Decisions Largely Govern Overall System Life Cycle Cost

In order to reverse the Army acquisition termination, schedule and cost overrun track record of the last two decades, the Army must significantly improve the productivity, efficiency and responsiveness of the Big A investment. The panel strongly recommends the Army focus pre-MS B resources on getting the requirement right and managing risk better for more stability, rapid tech insertion, reduced 'requirements/technology creep' and reduced sustainment burden. Weapon systems history shows that by MS B, only about 10% of the acquisition cost has been incurred yet the decisions made pre-MS B determine about 70-80% of what the acquisition costs will be (Refs 128 and 144).

- **Limit the number of KPPs and KSAs**
- **Establish threshold and objective values for KSAs to enable trade-offs**
- **Obtain initial system cost parameters from G-8 and DASA(CE) prior to MDD**
- **Include MANPRINT metrics and considerations in Systems Engineering Plan and AoA**
- **Involve test community in developing and costing test strategy before MS A**

Figure 40. Focus Pre-MS B Resources on Getting the Requirement Right

The number of KPPs should be restricted to only those which if not met would cause program cancellation and should be limited to 3-7 for a given program, but not more than 10. Schedule, cost and sustainment/RAM should be KPPs unless specifically waived by the Acquisition Executive. KSAs again should be carefully limited, but should include threshold and objective values to enable tradeoffs by developers/contractors, without having to have the CDD changed.

Prior to MDD and with the initial ICD, an initial estimate of technology cost drivers and of affordable program costs should be developed and provided by G-8 and DASA(CE) as members of the ICDT, or STF for selected ACAT I systems.

As part of the ICDT and prior to MS A, the G-1 MANPRINT and ARL HRED should develop and provide human performance requirements and MANPRINT metrics for the Systems Engineering Plan and provide MANPRINT considerations as input to the AoA.

Again, after MDD and prior to MS A, ATEC must develop the T&E Strategy in concert with the AoA so key operational factors can be identified, data can begin to be developed from multiple sources during system development, and costs and time required for T&E can be identified.

Type	Description	Overall Risk [Tech-Integ- Program]	Acquisition Strategy	Contract Type	Requirement	Color of \$	Approver	MDD - MS B	MS B - C	Maximum DoDI5000.2 Info Requirements
1	Existing system, NDI w/ ECPs for safety, RAM & LCC	Low [L-L-L]	ECP	FP	CCB [Safety, RAM, Life-Cycle Sustainment]	Procurement	PM/PEO	~3-6 mos.	½ - 2 yrs	ECP w/ATP
2	Existing system, development w/ block improvement	Low - Mod [L-L-M]	2 Step	FPIF or CPIF	I/CDD	RDT&E	PEO/SAE	1-2 yrs	1.5-3 yrs	TDS, STAR(U), AS, APB (U), CARD(U), SEP, TEMP, LCSP(U)
3	New system, to improve an existing capability w/produced tech & better engineering	Low -Mod [L-M-M]	2 Step	FPIF	I/CDD	RDT&E	ACAT II /IC= PEO/SAE ACAT ID = DAE	1-2 yrs	3-5 yrs	AoA, TDS, STAR, CARD, AS, APB, SEP, TEMP, LCSP
4	New system providing a new, innovative capability with developed, proven technologies	Mod [M-M-M]	Subsystem Proto + Dev	CPIF	I/CDD	RDT&E	ACAT II/IC = SAE ACAT ID = DAE	2-5 yrs	4-6 yrs	AoA, TDS, STAR, CARD, AS, APB, SEP, TEMP, LCSP
5	New system for early adoption of technologies yet to complete development	High [H-H-H]	System Proto + Dev	CPIF	I/CDD	RDT&E	ACAT II/IC = SAE ACAT ID = DAE	4-8 yrs	4-6 yrs	AoA, TDS, STAR, CARD, AS, APB, SEP, TEMP, LCSP
RA	Rapid Acquisition									
	J/ACTD	Mod-High	J/ACTD	Varies	ONS	6.3-6.7	PEO/SAE	~2-4 yrs	N/A	ACTDP
	REF	Low-Mod	Rapid Proc	FPIF	UONS	Proc/OMA		~3-18 mos	0	Varies
	RFI	Low	Rapid Proc	FPIF	JUONS	Proc/OMA		~3-6 mos	0	Varies

Figure 41. Manage Acquisition By Program Risk, Not Just Scope

Tailoring the acquisition strategy, as well as the review and approval of programs, should not simply be governed by how big they are, but also by their inherent risk and urgency. In pursuit of a sound risk management and a tailored approach to requirements, to the PPBE system and to acquisition, our review identified six acquisition models/types that differ in risk, development time and cost. The attributes for Types 2-5 in the matrix in Figure 41 are assessed at MS B. The review, reporting, decision level and grade of the PM should be tailored accordingly. All types should not exceed 5 years from MS B to MS C. If a new system is required, a Type 3 acquisition strategy should be selected unless the PEO/PM and TRADOC can provide a compelling justification with supporting analysis for other than Type 3.

- **Type 1** – Non-developmental item (NDI), a low-risk approach to continuously improving the safety, Reliability, Availability and Maintainability (RAM), sustainment and affordability of an existing system with engineering change proposals (ECP). The system manufacturer submits an ECP to the PM, who quickly evaluates it and the Acceptance Test Plan (ATP). If the PEO/PM's Configuration Control Board (CCB) deems it worthy and procurement funds are available, typically a fixed price modification to the existing production contract is made. From PM receipt of the ECP to implementation of the modification normally takes from 9 months to 2.5 years. Because there are no decision reviews above the PEO who has the resources, this is a rapid, lean and effective approach to continuously improve the safety, sustainment and life cycle costs of an existing, stable system. This has been successful on many programs, including the Apache program, an exemplar of which is illustrated in Figure A.1 in Appendix A.
- **Type 2** - Existing system with block improvement. This approach is low to moderate risk and can be either fixed price incentive fee (FPIF) or cost plus incentive fee (CPIF), depending upon the extent that technological risk has been eliminated before block improvement development. This has been successful on many programs, including block III of the Apache, as illustrated in Figure A.2 in Appendix A (Ref 54).
- **Type 3** - New system providing improved performance of an existing capability with developed, produced technologies (government off the shelf (GOTS) and commercial off the shelf (COTS)) and/or better engineering. A FPIF contract would be typical considering the low technical risk associated with this approach. This has been successful on many programs, including the Stryker program, which is a design variant

of the USMC Light Armored Vehicle (LAV) (see Figure A.3). The Light Utility Helicopter (LUH) UH-70 Lakota is another successful example. As demonstrated in the recent termination of the Armed Reconnaissance Helicopter (ARH) program, even this low-moderate risk approach can fail if it turns out that instead of the proposed design being based on COTS and GOTS, the design in development requires technologies, components and subsystems that are not already developed, qualified and in production.

- **Type 4** - New system providing a new, innovative capability with developed, proven technologies. The Army has chosen this moderate-risk acquisition approach for the new GCV program. One of the most successful applications of this strategy UTTAS, later designated the UH-60 Black Hawk, which made extensive use of competitive prototypes and eliminated technological risk prior to EMD. Typically, a CPIF EMD contract would be selected for this type of acquisition due to the technical and systems engineering risk. See Figure A.4 in Appendix A for an illustration using the Javelin missile.
- **Type 5** - New system for early adoption of advanced, yet-to-be-produced technologies, some of which must complete development after the system enters MS B. As demonstrated in the termination of the Comanche helicopter and Future Combat System (FCS) programs, this acquisition approach can be high risk and prone to many of the troubles described in the acquisition death spiral discussed in Figure 10.
- **RA** - Rapid acquisition. This is an essential 'go to war' rapid acquisition and fielding track. The enemy gets a vote and will not wait for the one-size-fits-all Big A system to act. There should be different acquisition decision and execution processes for rapid fielding initiatives based on requests from Combatant Commands of expeditionary forces versus deliberate initiatives based on QDRs or future forecasts. Task Force ODIN was a successful rapid acquisition. It delivered a counter-Improvised Explosive Device (CIED) capability in theater quickly. In cases where rapid acquisition is required, UONS, JUONS, or ONS should be accepted as the requirement, and only currently available, mature technologies should be used. Testing should be limited to assuring safety of the system, effective soldier/system interface, and acceptable operational availability and effectiveness. The current Capabilities Development for Rapid Transition (CDRT) process should be continued to determine which systems

acquired through rapid fielding should be terminated, retained in theater only for the current conflict or transitioned to programs of record. In the latter case, the system enters the traditional process. In Appendix A, see Figure A.5 for the Command Post of the Future (CPOF) and Figure A.6 for the Joint/Advanced Concept Demonstration (J/ACTD) rapid acquisition strategy examples.

Type	Aviation	Precision Fires	Ground Combat Sys	Air/Missile Defense	ISR	Network	Soldier & Small Unit
1	AH-64D Blk II	HELLFIRE II	Uparmored HMMWV	Chaparral Missile	ANVIS	PRC-112A	M16A2
	UH60K						IBA
2	AH-64D Blk III	GMLRS	M1A2 SEP	Improved Hawk	2 ^G FLIR HTI	PRC-112G	PGMM
		PGK				MSE	
3	ARH	HIMARS	Stryker	SLAMRAAM	LLDR	WIN-T Incr 1 [JNN]	M4
	LUH	LW155					GSS
4	UTTAS	Javelin	GCV	PATRIOT Air Defense	FLIR	FBCB2	M16
		LOSAT			JLENS		
5	AAH	NLOS-LS	FCS MG V	PATRIOT HTK THAAD	Longbow	WIN-T Incr 2-4	OICW
	Comanche	Crusader(LP)			ATIRCM	JTRS	Land Warrior
RA	SOA	TF ODIN	MRAP	C-RAM	P/RCMRL JCTD	CPOF	Packbot

These 6 types differ in risk, development time and cost (Types 2-5 assessed at MS B):

1. Existing system non-developmental item with engineering change proposals (ECP)
2. Existing system with block improvement
3. New system providing improved performance of an existing capability with developed, produced technologies and/or better engineering
4. New system providing a new, innovative capability with developed, proven technologies
5. New system for early adoption of advanced, yet to be produced technologies

RA Rapid acquisition in response to a COCOM

Figure 42. Types 1-5 and RA Examples

As documented by many previous GAO and DoD studies, if a program enters MS B without technological risk being eliminated that program is at a much higher risk of slippage, cost overrun and/or termination. This is also illustrated by the programs in Figure 42, which are grouped by CPR portfolio and acquisition type and further defined in Figure 41. The Army acquisition track record indicates that Types 1-3 are more likely to be on cost, on schedule and to meet performance requirements. Type 5 acquisitions clearly have more terminations and schedule slippages.

- **Promulgate acquisition strategy templates for the 6 types of acquisition programs to manage by risk as well as scope**
 - Restrict Type 5 acquisitions to only 'game changing' military capabilities
 - Encourage and fund competitive pre-MS B prototyping of systems, subsystems and components
 - Expand use of fixed price and incentive fee contracts consistent with risk type
 - Expand the acquisition of Technology Data Packages (TDP) during the development stage when the government has the most leverage and compete using the TDP during system acquisition and sustainment phases consistent with the estimated risk-reward
 - Limit documents to those shown in the risk management matrix for a given acquisition type
- **Emphasize more Types 1, 2 and 3 acquisitions for shorter cycles, more stability, rapid tech insertion and reduced 'requirements/technology creep'**

Figure 43. Review, Approve and Manage Programs By Risk – Not Just Scope and Cost

The recommended risk management approach is to review, approve and manage programs by risk (nature and level) as well as schedule, scope and costs. This means, compared to the past two decades:

- Emphasize more Types 1, 2 and 3 acquisitions for shorter cycles, more stability, and less requirement creep. Eliminate concurrency between technology development and EMD.
- Fewer Type 4 new systems programs.
- Starting many fewer Type 5 acquisitions, because they involve the 'early adoption' of technologies that have neither been produced nor had technology risk eliminated

through successful prototyping before Milestone B. Type 5 acquisitions should be restricted to only those that are truly urgently needed because they represent ‘game-changing’, revolutionary military capability, e.g., atomic bomb, night vision, fire-and-forget missiles and stealth.

Figure 43 cites other elements of the recommended acquisition strategy. Appendices B.4 and B.5 discuss existing statutory and regulatory documents.

- **Require the PM to identify to the ASARC which type of program acquisition strategy is proposed, and justify any deviation from the attributes for that type**
- **Request OSD and the Congress revise the Nunn-McCurdy Act so that a system block improvement or increased procurement quantity will not cause a breach of the Nunn-McCurdy threshold**
- **Adhere to TRL definitions to assess technological risk**
- **Properly define and promulgate Integration Readiness Level (IRL) and Manufacturing Readiness Level (MRL) criteria for use in determining readiness to enter EMD and production**
- **Give priority to vertical technology insertion (VTI) and horizontal technology integration (HTI) of proven advanced technologies via evolutionary acquisitions with growth capacity (Types 1-3)**

Figure 44. Restore Risk Management, Discipline and Accountability For Product Development

The ASA(ALT) should require the PEO/PM to identify to the ASARC which type of program acquisition strategy shown in Figure 41 is being proposed, and justify any deviation from the attributes for that type.

The Army should request that OSD and the Congress revise the policy so that a system block improvement or increased procurement quantity does not include initial program cost in the threshold for a Nunn-McCurdy breach. Current policy requires adding the original program cost baseline to the cost of a block improvement of the system, or to an increased quantity. This disincentive to evolutionary acquisition can lead to an artificial Nunn-McCurdy breach. A block improvement or added quantity should be a ‘stand-alone’ ACAT program. This recommendation if approved, would assign the MDA consistent with scope and risk of the stand alone block improvement.

The Technology Readiness Level (TRL) construct (see Figure A.7 in Appendix A) has too often been misapplied or inconsistently applied. TRLs are intended to assess the state of technology maturity prior to receiving approval to entering MS A & B. Now DDR&E is considering a TRL analysis to assess readiness for testing. TRL definitions and the applicability of TRL assessments in predicting risks should be clarified to the workforce.

The ASA(ALT) should request that the USD(AT&L) add properly defined Integration Readiness Level (IRL) and Manufacturing Readiness Level (MRL) criteria for use in determining readiness to enter EMD and production

The Army should give more priority to vertical technology insertion (VTI) into systems, and horizontal technology integration (HTI) across the force, of proven advanced technologies via evolutionary acquisition. Big A must be aligned with the Army operational tempo/cadence. We must modernize, train and field by unit in synch with the ARFORGEN process, the Reset, Train/Ready, Available model.

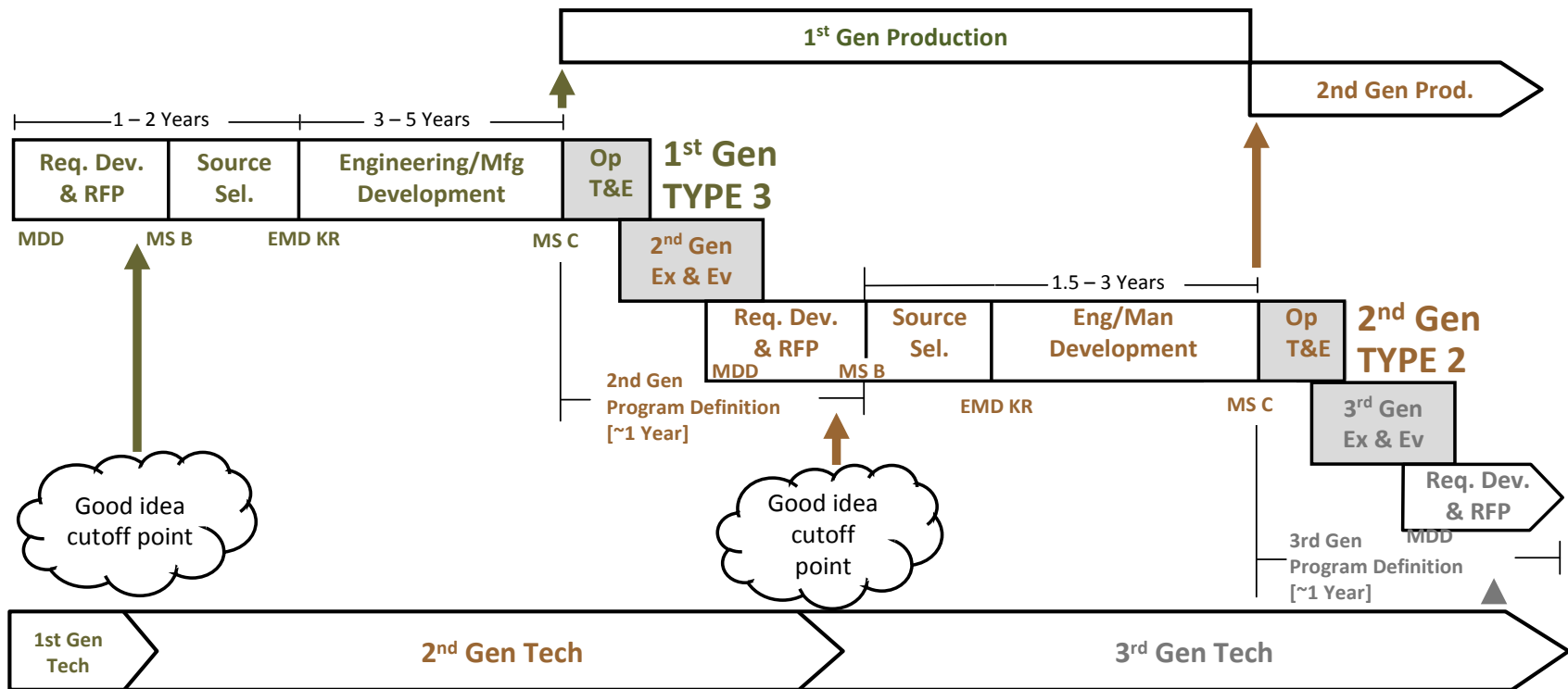
DoD 5000 series encourages evolutionary acquisition and tailoring of the acquisition strategy to properly manage risk, and reduce failures and program slippages; however, the bureaucratic impediments to complying have not been removed. According to DoDI 5000.02, December 8, 2008, *“...evolutionary acquisition is the preferred DoD strategy for rapid acquisition of mature technology for the user. An evolutionary approach delivers capability in increments, recognizing upfront, the need for future capability improvements. The objective is to balance needs and available capability with resources, and to put capability into the hands of the user quickly. The success of the strategy depends on phased definition of capability needs and system requirements, and the maturation of technologies that lead to disciplined development and production of systems that provide increasing capability over time.”*

For the evolutionary approach to work it is absolutely necessary that provisions for growth are designed into the first model in the evolutionary process. This applies to power, weight, space, modular design, etc.

The characterization of program types by risk in Figure 41, as recommended by the panel, facilitates evolutionary improvement strategies. Evolutionary acquisition strategies would

benefit considerably from leveraging and receiving credit for data/information obtained during simulation, system integration lab and experimentation performed before MS C to more efficiently conserve resources during Development Test/Operational Test (DT/OT). This was done during the Force XXI Digitization initiative. The Army would get a better capability sooner, at lower cost with more program stability and fewer false starts, technical and fielding risks. There would be better program support by the warfighter, OSD and Capitol Hill.

It is important to note that experiments are different from demonstrations, tests or exercises. Successful Army warfighting experiments include the 11th Air Assault and Force XXI Digitization. Examples of acquisitions that would benefit from experimentation supported evolutionary acquisition include network centric battle command and control; networks of manned and unmanned aerial and ground vehicles; precision fires; and performance based logistics. Figure 45 illustrates the evolutionary/incremental acquisition strategy.



- Type 3 development [Gen 1] with Type 2 incremental improvements [Gen 2,3,...n]
- Leverages live/virtual/constructive simulation
- OT [baseline for next gen], battle labs and war fighting experiments have a key role
- Requires stable modification/upgrade funding line

Figure 45. Improved Evolutionary/Incremental Acquisition Strategy

When an ICD is refined through the ICDT or STF process and an MDD for a new system is approved, the preferred acquisition strategy should be a Type 3. The acquisition strategy for this type system is denoted as 1st Generation Type 3 in Figure 45. Because a Type 3 system has no technological, and little technical, risk it can often be delivered to Initial Operational Capability (IOC) within 4-7 years from MDD. In parallel with delivery of the first generation system capability, the block improvement/incremental requirements effort can continue along with R&D to reduce technological risk for potential upgrades if this improvement is within the capabilities of the requirement document for the 1st Generation system, the requirement does not need to change. If beyond those requirements, the change should only be an extension of the initial requirement document. Such R&D effort might include development of demonstration prototypes as part of the ASTMP, experimentation with troop units or both. Furthermore, follow-on upgrade increments to the first generation system can benefit considerably from receiving and leveraging OT data and information from units equipped with the first generation system. Upgrade increments also benefit from the aforementioned R&D and/or experimentation effort. All this not only contributes to the success of upgrade increments, it conserves DT/OT resources.

Evolutionary acquisition should be the preferred approach and the requirement, acquisition strategy and technology selection for increments should leverage and be informed by comparison with the preceding DT/OT results as shown in Figure 45. In order to better manage risk, improve affordability, reduce development cycle time and be more responsive to the warfighters' needs in an increasingly unpredictable world of conflict, the Army should incentivize the evolutionary acquisition strategies illustrated in Figure 45:

- Encourage Type 3 acquisition strategy for new system design development.
- Continuously, incrementally improve/evolve the first-generation system and subsequent-generations systems via ECPs and successive Type 2 block improvements as shown in Figure 45. OT results are 'reused' as Generation 1 capabilities baseline for assessing the added value of proposed Generation 2 capabilities/attributes during subsequent short and focused OTs.
- Any requirement refinement and the results of the parallel technology development and validation establish the required capabilities the RFP will specify.

- Technologies that are not proven to be mature and needs that do not make this ‘good idea cut-off point’ must wait to be nominated for the next increment/block improvement.
- This acquisition strategy builds on proven technologies and resource-informed requirements to soundly manage risk and to deliver upgraded capabilities potentially every 2.5 to 4 years.

- **Reestablish the difference between IRAD and B&P**
- **Increase Army visibility into contractors’ IRAD programs, but site reviews should be to exchange information, not just a grading exercise**
- **Build “high walls” around small, critical areas, rather than subjecting commercial products to ITAR restrictions**
- **Continue strong participation in the export control reform process**

Figure 46. Improve Oversight of Industry Technology

The Army needs to restore B&P as well as IRAD activities to their original intent: B&P is intended to fund preparation of a bid or proposal; IRAD is supposed to be company research and development with an intermediate and long-range horizon to meet capability requirements.

The government on site reviews should be reinstated, but they should not be a grading exercise; rather, they should be an exchange of information by subject matter experts (SME) and an opportunity for government and industry to learn of each other’s technology needs, plans, efforts and risk reduction.

ASA(ALT) should press for simplified, common-sense, timely changes to the ITAR as strong participants in the Export Control Reform initiative. Develop and propose an Army position that features “high walls” around narrowly defined, high-value, militarily useful technologies but lower the barriers to exporting systems and technologies already available in the international market.

III.3 ALIGN ORGANIZATIONS, INCENTIVES AND ACCOUNTABILITY

- **VCSA should co-chair the ASARC with the ASA(ALT); ASARC to make appropriate recommendations to the AAE**
- **Capability Portfolio Reviews:**
 - The VCSA and the AAE should co-chair Session 1 of the materiel CPRs
 - Codify the conduct of CPRs in an Army Regulation
 - Include a requirement to review the interdependencies among portfolios
- **Re-designate PEO Soldier to be PEO Soldier and Small Unit**
- **Seek OSD and Congressional approval of the PEO Soldier and Small Unit recommended consolidation and alignment of funding lines for his programs**
- **Synchronize the ASTAG and ASTWG cycle with the POM submission cycle**
- **Improve the alignment among the PEO structure, Equipping PEG, BOSs, CPRs and TRADOC Centers of Excellence**

Figure 47. Align Acquisition Organizations

The VCSA should co-chair the ASARC with the ASA(ALT) to provide materiel recommendations to the AAE. As the Senior User on the ASARC, the VCSA can identify and initiate resolution of requirements, priority, logistics, funding and testing issues – the key issues in early program development.

The ASARC does not make acquisition decisions, the Army Acquisition Executive does. The Acquisition Decision Memorandum is signed by the AAE. Designating the VCSA as co-chair of the ASARC does not violate current statute or the spirit of Goldwater-Nichols and the VCSA co-chaired the ASARC until 2002. The Packard Commission was even stronger in advocating military participation in acquisition decision making.

The AAE should co-chair Session 1 of the materiel CPRs. This would provide the AAE an early insight into extant and emerging requirements and provide him a broader picture of needs and capabilities in related technology areas.

Codifying CPRs in an AR will give some assurance that the process will be continued when leadership changes. The responsibilities and accountabilities of participants in a CPR should

be clearly defined. CPRs are intended “to conduct an Armywide, all components revalidation of requirements...The goal of this revalidation...is to ensure that funds are programmed, budgeted, and executed against validated requirements and cost- and risk-informed alternatives” (Ref 250). The CPRs would be even more valuable with greater analytic support that could address and assess interdependencies across portfolios.

PEO Soldier should be redesignated PEO Soldier and Small Unit, with small unit being defined as crew, team, squad and section. This would enable the PEO Soldier and Small Unit to address the equipment needed by each soldier in a small unit rather than equipping them identically, and to better consider the interoperability and interdependence of the small unit with higher-echelon networks, battle command, and intelligence. Other PEOs and PMs developing equipment, such as communications systems and man-portable missiles, to be carried by soldiers would be required to coordinate with PEO Soldier and Small Unit. This also recognizes that the burden on the soldier is no longer just weight but also information overload and power requirements.

The Equipping PEG, BOS, MDEP and Program Element structure should be consolidated and better aligned to improve PEO Soldier resourcing and requirements stability and program execution. PEO Soldier is gravely encumbered by more than 70 different RDT&E and procurement funding lines spanning multiple TRADOC Centers of Excellence and acquisition organizations. This engenders program funding and requirements instability, and presents a serious barrier to productivity.

The ASTAG/ASTWG were created to collaboratively update, on an annual basis consistent with the POM timeline, the Army S&T strategy, plan, program and priorities. It is now out of synch with the POM build and approval cycle. The 4-Star ASTAG must review and approve S&T plans and priorities in time for input to the POM. TRADOC, G-8 and AMC should participate in the ASTWG at the MG level.

TRADOC Centers of Excellence	Capability Portfolio Reviews	Equip PEG BOS	PEO Current	PEO Recommended
Maneuver	Soldier	Multiple	PEO Soldier	PEO Soldier and Small Unit
Maneuver	Ground Combat Systems	Maneuver	Ground Combat Systems (GCS)	GCS
Aviation*	Aviation	Aviation	Aviation	Aviation
Fires, Maneuver, Maneuver Support	Ammo	Ammo	Ammo	Ammo
Fires	Precision Fires	Fire Support	Piece of GCS + Missile & Space	Piece of GCS + Missile & Space
Fires	Air & Missile Defense	Air Defense	Missile & Space	Missile & Space
Maneuver Support	Engineer Mobility Systems	Mobility	CS/CSS	CS
Sustainment	Tactical Wheeled Vehicles	Mobility	CS/CSS	CSS
Mission Command	Network	Command & Control	C3T/JTRS	Mission Command
Signal*	Network	HTI	Integration	Network
Intelligence*	ISR	IEW	IEWS	IEWS
			Enterprise Information Sys (EIS)	Enterprise Information Sys (EIS)
			STRI	STRI
* Subordinate centers of excellence				Changes indicated in gray

Figure 48. Better Align PEO Structure

In business as well as in the military, it is important to have the organization's vision, strategy, plan, priorities, incentives and resources (financial and human) aligned if productivity and efficiency are to be maximized. Alignment facilitates efficient focus of the community's resources and efforts on the objectives of the organization. An important enabler or barrier to achieving better productivity and efficiency is alignment of organizational units and processes. The current PEO structure is shown in the fourth column of Figure 48. To the left, the current PEOs are correlated with the current Equipping PEG, BOS, CPR portfolio and TRADOC CoE. While the current PEO structure is substantially aligned with the TRADOC CoEs, CPR portfolios and the PEG BOSs, the review panel recommends the following changes:

- Split the current Combat Support/Combat Service Support (CS/CSS) PEO into separate PEO CS and PEO CSS as shown in the right hand column of Figure 48. The span of control and scope of the current PEO CS/CSS are too large. The CS/CSS PEO has over 500 systems, 44 Project Managers, 13 Product Managers, 4 Product Directors, and 527 personnel (Refs 219 and 119). PEO CS/CSS is not aligned with a single CoE or CPR portfolio; however, our recommendation would have PEO CS aligned with Maneuver Support CoE and Engineer Mobility Systems portfolio. PEO CSS would be aligned with the Sustainment CoE and Tactical Wheeled Vehicles CPR portfolio.
- Expand the mission of the PEO Soldier to become the PEO Soldier and Small Unit and cut the number of RDT&E and Procurement funding lines in half through consolidation. PEO Soldier is currently hampered by having over 70 funding lines. This improved organizational and funding alignment will not only improve efficiency and productivity, it will empower a PEO to consider the interdependencies and synchronization between the soldier and the small unit to achieve soldier and unit capabilities. This is particularly important to unit fielding, survivability, precision fires, networks, communications, situational awareness, sustainment and power management to name a few critical parameters.
- PEO Integration should be terminated and PEO Networks created. Existing PMs in PEO Integration, PEO C3T and PEO JTRS should be realigned into PEO Network and PEO Mission Command.

- **Rebuild the highly efficient and effective triad of the military DASC, SSO and PAE AO at the O-4/O-5 level (no contractors), with 'knowledge authority' and locate in the Pentagon**
- **Set time limits for document review and decision – Hold staffs accountable**
- **The LCMC CGs should retain their:**
 - Head Contracting Authority (HCA) role
 - Depot, IMMC and Item Manager functions
- **Make PMs lead/accountable for acquisition logistics during development through successful IOC fielding and LCMCs lead/accountable for post-fielding operational logistics**
- **Disestablish RDECOM and return the RDECs to the LCMC Commanders:**
 - Establish a MG or SES 5 Executive Director for RDA reporting directly to the CG AMC
 - Annually review Labs and RDECs to eliminate low value added, duplicate efforts
 - Use the 332 RDECOM positions saved to resource the additional TRADOC and AMSAA ORSA positions, the Directorate for Advanced Systems at AMRDEC, TARDEC, CERDEC, NSRDEC and ARL, and military DASCs
 - Realignment of ARL and ARO should be determined by the on-going ASA(ALT) study

Figure 49. Improve Organizational Productivity and Efficiency

A strong DASC organization staffed with Acquisition Corps military officers of grade and experience commensurate with their G-3 and G-8 peers is essential to restore the 'Triad' that balanced budgets versus requirements versus priorities versus executability; avoided uninformed budget cuts; and kept the Project Managers aware of issues developing in the ARSTAFF and the Army in the field. To be effective in representing PMs, PEOs and ASA(ALT), the DASCs must be located in the Pentagon and must be military of a quality and rank equal to their G-3/5/7 and G-8 peers. This will also prepare and make them highly competitive for Product Manager and Project Manager positions, where their ARSTAFF experience will prove invaluable in providing them the total Army context in their preparations for program reviews, budget drills and ASARCs/DABs.

Time limits should be set for document review and decision and hold staffs accountable for compliance and outcome, e.g., Pentagon approval of Justification and Approvals (J&A) should not take more than 30 days; and ICDs and CDDs should not take more than 4 months.

PMs should be responsible for acquisition logistics. PMs were created principally to bring professionalism to the development, qualification, production and fielding of military systems (including their initial spares and training systems) and improve cost, schedule and performance. Asking them to also be operational sustainment experts for fielded systems is a dilution of their management attention to their primary responsibility.

RDECOM HQ has not demonstrated sufficient value to be continued. Compared to pre-RDECOM, we found no evidence of a major elimination of redundant effort, no significantly better leveraging of defense and commercial industry technology advancements, nor more products resulting from RDECOM HQ actions to improve collaboration within the ARL/RDEC system. RDECOM HQ is an additional burden between the PEOs who typically are co-located at the same installation as the LCMC and the RDEC, from which the PMs draw their matrix support.

At a time when the generating force must be streamlined and productivity of the Acquisition Corps greatly improved, RDECOM HQ and the additional management layer it represents cannot be afforded. RDECOM HQ has 332 government positions (42 military and 290 DA civilians) in addition to 52 contractors (Ref 284). RDECOM HQ positions and funding saved should be re-invested to meet the need for ORSA professionals and staffing for the DASs; thereby reducing the acquisition failure rate, reducing program instability and getting product to the warfighter that does the job required when it is needed. The RDECs should report to the CGs of the LCMCs with AMC HQ staff oversight by at least a 2-Star GO or SES 5 Deputy Commander or Chief of Staff who reports directly to the CG AMC. Once returned to the LCMCs, RDEC leaders must avoid becoming insular and should routinely draw on other RDECs for specialized technical support rather than try to cover all bases. They should be evaluated on their matrix support to other organizations and how effective they are at leveraging the capabilities of other RDECs.

RDECOM and AMC have neither demonstrated that they sufficiently comprehend nor value the importance of: science and technology to the Army in the long term; ARL; or ARO. Consequently, the panel recommends that the Army give serious consideration to ARL

(including ARO) either becoming a field operating agency (FOA) to the DASA(R&T) or at least give the DASA(R&T) operational control similar to that exercised by the G-1 for the Army Research Institute for the Behavioral and Social Sciences.

- **Chief Management Officer (CMO) promulgate policy and develop metrics for line and staff accountability in the 'Big A'**
- **ASA(ALT) request the ASD(Acquisition) direct DAU to establish an accountability course for PEOs, PMs, TCMs and other key personnel involved in the 'Big A'**
- **Stress the importance of having value-added reviews and hold IPTs and their individual members accountable for their actions**
- **Clarify 'inherently governmental position' criteria and reduce the 'gray area' acquisition positions**
- **Army leadership improve communication with industry**
- **Consider a "partnering" relationship with industry to solve issues short of formal protests**

Figure 50. Improve Big A Accountability

The Chief Management Officer (CMO) should promulgate a policy clearly defining line and staff accountability of all personnel involved in the in the Big A Process. Every PM and PEO interviewed knew their mission, clearly understood their responsibilities and was focused on meeting cost, schedule and performance thresholds, including immediate responsiveness to warfighters' readiness needs. Yet, too many personnel in the acquisition community without budget or schedule responsibility can add cost and slip schedules with good intentions, but with marginal value. Personnel in TRADOC, AMC, the Army Staff, and the Army Secretariat must be held accountable for their major roles in the Big A process. The accountability policy should clearly define the roles of these personnel in helping PMs and PEOs meet established cost, schedule and performance objectives.

The ASA(ALT) should request the ASD(Acquisition) to direct the DAU to establish a course on accountability for PEOs, PMs, TCMs and other key personnel, including prospective IPT members, involved in the Big A. This course should be mandatory for these personnel and clearly define their responsibilities in the success or failure of an acquisition program.

IPTs and their members must be held accountable for their actions. The activities of IPTs are not to ask for more data and more time to review program execution, which too often results in program cost growth and schedule slip with little value added. Instead they must act in concert with the PM to resolve issues, hold down costs and meet schedules. IPT members must be able to speak for their organizations. The accountability of IPT members should be clearly spelled out in the CMO accountability policy.

The review panel was unable to find a clear definition of “inherently governmental positions.” The Army must clarify this. Of most concern is the growing number of contractors performing “gray area” jobs, which appear to be inherently governmental jobs, such as DASCs in the Office of the ASA(ALT). The DASC position is a high-responsibility position, representing the Project Manager and the ASA(ALT) in the Pentagon, and should definitely be identified as an inherently governmental position. There are other similar positions that should also be identified as such.

Dissatisfaction of industry with the Army Acquisition Corps, which was described in the findings, must be corrected by improving communication between the government and industry. The current initiative by the ASA(ALT) to improve communication with industry leaders is a step in the right direction, but must be accomplished at all levels in the Big A process. Industry days are well-intended, but ineffective. Companies are not going to discuss their good ideas in the company of competitors. The Joint IED Defeat Organization (JIEDDO) has a good model, which should be considered for application by the Army acquisition community. When they have industry days they present their problems in a combined session, normally classified, and then conduct one-on-one meetings with industries to hear their proposals.

AMC piloted a program in the late 1980s that was very successful in preventing formal protests and solving issues with industries. If a company had an issue with a source selection or other activity, they could raise the issue with the AMC General Counsel or Ombudsman, who would investigate the issue and recommend a resolution to the AMC Commander. If the issue had no merit, the reasons for that determination were discussed with the company involved. If it had merit, corrective action was taken. Using this procedure to solve issues did not prevent the company involved from going the formal protest route if they were not satisfied with the AMC finding. Noteworthy is the fact that few of the issues investigated resulted in formal protests or other complaints after the company was debriefed on the

results of the AMC internal investigation. The review panel believes that a similar procedure by the ASA(ALT) and others involved in the Big A process would go a long way in improving government and industry relations.

III.4 RESOURCES

- **Reestablish the position of the Deputy Undersecretary of the Army for Operations Research (DUSA(OR)) and staff the office with 9 people, including 3 military analysts**
 - **Increase the authorization and fill of FA 49 military analysts needed to support Army acquisition**
 - **Combine analytical capability within AMC (AMSAA, SLAD, LOGSA) into a single organization reporting to the AMC Command Group**
 - Provide a 15 person analytic cell from this organization at AMC headquarters
 - Increase the military analysts within AMSAA to 15
 - Use management spaces saved by the organizational integration to increase the quality and quantity of analysis
 - **Direct TRADOC conduct an in-depth review of the required and authorized Capability Development personnel, including scientists, ORSAs and cost analysts at ARCIC, TRAC and Centers of Excellence with a recommended minimum:**
 - Team of seven ORSA analysts available at each Center of Excellence's CDID
 - Of five Cost Analysts at the ARCIC
- The Army provide the identified resources**
- **Establish a Center for Army Acquisition Lessons Learned within the Center for Military History**
 - **Require:**
 - An After Action Review (AAR) after every milestone decision and program critical event
 - A lessons learned report after program MS C or cancellation

Figure 51. Strengthen the Analytical Workforce

The position of DUSA(OR) should be reestablished with the original mission including proponentcy for OR personnel and quality assurance of Army studies and analysis. Filling this position should reestablish the independent spokesperson for the Army regarding the quality of analysis with DoD and the Congress. Selection of the DUSA(OR) should be based upon the individual's experience in military operations research and in testing. The office of the DUSA(OR) should be staffed as it was in the past, with nine people including three military FA 49 analysts.

The authorizations and fill of military analysts (FA 49) needs to be raised to satisfy the increased demand for analyses of the current warfighting environment. While the fill of authorized FA 49 analysts in the Army is at 84%, the criticality in TRADOC and AMSAA is more severe. TRADOC is only authorized 53% of its required military analysts and is then filled at only 56%, meaning that only 29% of the required military analysts in TRADOC are available to perform this critical function. AMSAA is authorized only one FA 49. This situation must be corrected.

Combine the analytical capability within AMC (AMSAA, SLAD, LOGSA) into a single organization reporting directly to the AMC Command Group with the responsibility to conduct, manage, and provide quality control for all AMC studies and analyses. This new organization should provide a cell of 15 analysts at AMC HQ to respond to analytic needs of the headquarters with reachback access to the entire organization. The remaining elements of this organization do not need to be relocated. Increase the military analysts within AMSAA to 15 to provide the essential operational perspective. Use management spaces saved by the organizational integration to increase the quality and quantity of analysts. This recommendation is consistent with the recommendation to eliminate RDECOM.

TRADOC needs to conduct an in-depth review of the number of scientists, operations research (1515 and FA 49) and cost analysts needed to perform the Capabilities Development process within the ARCIC, TRAC, and the CoEs to rectify the total lack of consistency. Once the review is completed, the increased manpower requirements should be filled. Our initial assessment is that each CoE should have a team of at least seven ORSA analysts and that the ARCIC should have a minimum of five cost analysts.

A Center for Army Acquisition Lessons Learned should be established to provide a record of our acquisition experiences to have people understand what occurred, avoid previous mistakes, and provide the basis for making improvements.

An After Action Review (AAR) should be conducted after every milestone decision and significant program event, and a report should be prepared after every MS C and for each program cancellation. These reports should be filed and retained by the newly established Center for Army Acquisition Lessons Learned.

- **Establish and resource Directorates for Advanced Systems (DAS) at the AMRDEC, CERDEC, TARDEC and Natick Soldier RDEC**
- **Assign a Concept Manager from the PEO or DAS prior to MS A for ACAT 1 programs**
- **Establish data-informed process for balancing acquisition workforce requests, supply and quality**
- **Increase the number of qualified systems engineering, cost estimating, quality assurance and ORSA personnel in the 'Big A'**
- **Leverage FFRDCs and UARCs to make up for the shortfalls in the Army's systems engineering and analytic capabilities until the bench is replenished**
- **AMC establish a cadre of best practitioners experienced in establishing and conducting SSEBs – this cadre should be:**
 - A cell in AMC HQ that deploys to form and serve as the leadership for ACAT I SSEBs
 - Responsible for the lessons learned during SSEBs
- **Establish an ASA(ALT) Deputy Assistant Secretary for Services with a small staff for services acquisition, with similar responsibilities, authorities and accountability to those of the ASA(ALT) Deputy for Weapon Systems (being implemented)**
- **Complete implementation of Gansler recommendations, to include recommended improvements in services contracting:**
 - Increase the number and quality of contracting officers
 - Invest in generating GO-level contracting officers
 - Fully support the recent ASA(ALT) initiative that added 'Contracting for the Non-contracts Professional Course' to the HQDA 'How the Army Runs' Course

Figure 52. Strengthen The 'Smart Buyer' Workforce

Establish and resource a 30-40 person DAS at the Aviation and Missile Research, Development and Engineering Center (AMRDEC); Communications-Electronics Research, Development and Engineering Center (CERDEC); Tank Automotive Research, Development and Engineering Center (TARDEC); and Natick Soldier RDEC with the following attributes:

- An organic capability to lead pre-Milestone A new systems concept formulation and for pre-Milestone B perform development planning, explore promising advanced technology concepts, formulate and advocate advanced programs before there is a

Program Manager assigned, and serve as an honest broker for the prioritization of required technology programs.

- The DAS must be led by an SES reporting to the RDEC Director and should consist of the following divisions/offices:
 - Advanced Concepts Division with Concept Managers and a parametric analysis and design capability;
 - RDT&E Planning Division; and
 - Technology Assessment, which should be responsible for independent technology readiness assessments for acquisition programs, IRAD and ITAR.
- Concept Managers could serve as J/ACTD project leaders and ‘pre-PMs’ for development programs prior to a Project Manager being assigned.
- The DAS should be mission funded and cost share collaborative experimentation with relevant TRADOC CoEs.
- The DAS personnel should be expert in the best practices for performing pre-Milestone A and B activities, including but not limited to: concept formulation, concept definition, requirements analyses, parametric sensitivity analyses, cost/benefit tradeoffs, technology development strategy, preliminary design and best technical approach. This DAS cadre could also serve as the core of key personnel for the conduct of pre-MS A ICDTs and STFs to develop coherent, comprehensive documentation for the TEMP, integrated logistics support plan, STAR, acquisition strategy, procurement strategy, AoA, cost-effectiveness analysis and draft RFP for new ACAT I and II programs. This core set of experts, ‘rounded out’ by subject matter experts from the appropriate AMC and TRADOC centers, offers a more effective and efficient approach to continuously improving the process and capturing lessons learned.

The Director, Acquisition Career Management, in coordination with AMC, should establish policy, benchmarks and metrics to facilitate the balancing of acquisition workforce supply and demand trends in the PPBE process. These benchmarks should consider the total acquisition workforce, to include contractors. The Army should commit to developing and

using metrics and long-term data sets allowing it to track acquisition workforce supply and demand trends.

Because the formal DAWIA acquisition workforce definitions and organizational compliance coding has suffered instability over time (and category III coding will remain at risk), it would be sensible to supplement DAWIA data with organizational workforce counts whenever assessing the health of the workforce. The DoD In-House RDT&E Activities Report is an example of a reasonably stable source of personnel data. Unfortunately the Army keeps nothing comparable.

The Director, Acquisition Career management (ASA(ALT) military deputy) should direct a review, co-chaired by the DASA(R&T) and Functional Chief for Scientists and Engineers (S&E), of the outcome of the SPRDE-PSE competency assessment. Once completed, the review should evaluate the Army systems engineering:

- Professional development track.
- Certification standards.
- Position description's adequacy for accurate data collection.
- Policy, benchmarks and metrics for balancing workforce supply and demand.
- Policy, benchmarks and metrics for evaluating the quality of Grow the Acquisition Workforce new hires.

The Army needs more, highly qualified systems engineers, cost estimators, quality assurance and ORSA personnel. As explained in the Findings section of this report, the acquisition workforce reductions of the last two decades seem to have had a disproportionately adverse impact on these career fields at a time when DoD was advocating performance standards in RFPs, while mandating fewer Military Specifications, and more acquisition innovation and more understanding and leveraging of rapidly changing technologies. The AAWS-M/Javelin program discussed in section II.2 is an exemplar of managing risk and the importance of having highly qualified experts available in the DoD RDT&E community. Because the Army had the in-house expertise, had co-sponsored with DARPA a well-conceived IRFPA

producibility technology program and worked through its problems in AAWS-M, the Army now has a battle-proven, superior anti-armor missile for the individual infantryman.

It will take time to add these highly qualified experts to the workforce, therefore, the Army should leverage FFRDCs and UARCs to compensate for the shortfalls until the bench is replenished.

We observed signs and heard from interviewees that the Army's corporate memory and expertise to establish and staff SSEBs has eroded considerably. Because the Army develops fewer major weapon systems now, there are fewer engineers, cost estimators, project managers, contracting specialists and quality personnel who have major weapon system SSEB experience. AMC should establish a cadre of best practitioners experienced in the establishment and conduct of major weapon system STFs, SSEBs and SSACs. This cadre should be a cell in AMC HQ that deploys to form and serve as the leadership for ACAT I SSEBs and has the additional responsibility to document the lessons learned.

AMC should track the individual development plan, performance appraisals, and the SSEB experience and performance of its engineers, PMs, cost estimators, contract specialists and business managers and select the best for source selection duty. The Missile Defense Agency already tracks the SSEB experience of its PMs and SMEs to build the bench of experienced, trained and ready experts to establish SSEBs.

We agree with the ASA(ALT)'s decision to establish a Deputy Assistant Secretary of the Army for Services (DASA(Services)). We recommend that the ASA(ALT) include in the DASA(Services) portfolio responsibility for the acquisition of Systems Engineering and Technical Assistance (SETA) and sustainment services in and outside CONUS. The major missions of the DASA(Services) should be:

- Developing policy, standards, and guidelines for services contracts.
- Establishing contract value thresholds for delegation of approval authority.
- Developing a streamlined, line-management periodic review process for major services contracts.

- Supporting the ASA(ALT) and the military deputy in establishing an education, training and career path for service contract and execution management.

We also recommend complete implementation of the Gansler Commission recommendations, to include:

- Increase the number and quality of contracting officers.
- Invest in generating GO-level contracting officers.
- Add “Contracting for the Non-contracts Professional Course” to the HQDA “How the Army Runs” course.

- **Improve quality of Program, Project and Product management by selecting:**
 - At grade levels consistent with DA Pamphlet 70-3
 - Only PMs and PEOs with expertise and experience in their product lines
 - A PM for an ACAT I System at MS A
 - A GO PM for GCV and similarly complex, high visibility ACAT 1 programs
- **Improve qualifications of TRADOC Capability Managers (TCM) by:**
 - Selecting TCMs with operating force experience
 - Requiring attendance at the two-week resident Capability Development Course or its equivalent
 - Assigning a Colonel with operating force experience related to the appropriate capability need for ACAT I programs and limiting his scope to only this program
 - Funding with TRADOC mission funding
- **Provide Army Acquisition Corps (AAC) members an opportunity for re-greening through:**
 - Full resident participation at AWC and CGSC
 - Short assignment of potential PMs to staff positions in operational units
- **Increase AAC members' experience and understanding of industry and high technology by:**
 - Requesting a DAU course for PEOs, PMs and contracting officers on how industry is run, including familiarity with the financial 'top' and 'bottom' lines
 - Assigning more officers to DARPA, NASA and national labs to serve as Program/Project Managers
 - Providing career path, training, and supporting sponsor to officers assigned to DARPA, NASA and national labs
 - Actively solicit assignment of highly qualified Army officers to key OSD and JCS positions

Figure 53. Improve Qualifications of Requirements and AAC Workforce

Qualified program, project and product managers are essential to the development of systems meeting requirements within costs and on time. As a result, there are certain principles that should be followed regarding the assignment of PEOs and PMs. First, PEOs and PMs should be assigned only to programs in areas with which they have expertise and experience. All program, project and product managers should be at the grade level consistent with DA Pamphlet 70-3. For complex ACAT I programs with high political visibility, the PM should

be a general officer. For ACAT I programs, an experienced Concept Manager should be assigned prior to MS A and a PM should be assigned at MS A.

Considering the importance of the program to the Army, a General Officer Program Manager, Ground Combat Vehicle, should be established, reporting directly to either the AAE or the PEO GCS. This will emphasize to industry, OSD and Congress the importance the Army places on the success of this program. It also places an experienced senior acquisition leader in charge of the program as it enters the technology development phase, where critical decisions and technological risk elimination are required and which will substantially determine the success or failure of the program. It will also allow the successful PM to stay with the program at least until the successful MS B decision and be accountable for its success or failure.

TCMs provide a user perspective balance to AAC PMs. TCMs should be operationally experienced and not members of the AAC. Once selected, TCMs should be required to attend the Army Logistics University two-week resident Capabilities Development Course or its equivalent at the Army Force Management School. The Army Logistics University course introduces the processes used to achieve desired joint and Army warfighting capabilities needed for the 21st century. These processes focus on determining, documenting, and processing warfighting concepts, future operational capabilities, and doctrine, organization, training, materiel, leader development, personnel and facilities (DOTMLPF) requirements through application of the CBAs. This course concentrates on inputs to the JCIDS process; its sub-processes and products; its relationship to the PPBE process; and its relationship to the acquisition process. During this course, students are organized into an ICDT. In the ICDT forum, teams will research problems, prepare documentation, and present briefings needed to initiate solutions to achieve actual operational capabilities.

To capitalize on the teamwork needed between the PM and TCM, a Colonel with operating force experience related to the appropriate capability need should be assigned as the TCM for each key ACAT I program and be responsible to that program alone. To preclude any perception of a conflict of interest, TCMs should be funded with TRADOC mission funding versus the current practice of PEO/PM funding of TCMs.

The fast pace of requirements generation, systems improvement and system support in a decade of continuous combat understandably focused the Army Acquisition Corps on

supporting the generated force. As a result of this Army-wide effort, Army Acquisition Corps officers missed opportunities for broadening and growth assignments and lost/outgrew previous operational experience. These officers need to be “re-greened” and reintroduced to their counterparts and current operational doctrine and concepts, through full participation in residence courses at the Command and General Staff College and the Army War College.

Outstanding field grade Acquisition Corps officers with potential to serve as ACAT I and II Project Managers should be assigned to staff positions in operational units for short tours (1 to 1.5 years), without reducing the host tactical unit’s operational personnel fill. It is particularly important that they be assigned to Assistant S-3/G-3 or S-4/G-4 positions at Brigade or Division levels in order to understand soldier-equipment interfaces, tactics, logistical issues of fielded equipment and how the Army fights.

ASA(ALT) should request DAU include a module for PEOs and PMs to ensure their PMs receive adequate training to understand corporate finances and how industry is run. The modules for PEOs, PMs and Contracting Officers should include how industry perceives its interaction with the government and its own suppliers.

The capability of selected Army Acquisition Corps officers should be enhanced by assigning them to positions where they can better understand the existence, application, maturity and management of industry and high-technology developments. Such opportunities exist in ‘training with industry’ opportunities and in assignments to DARPA, NASA and national labs where they can and should serve as program and project managers.

If officers involved in the requirements and acquisition processes are to be effective, they must understand how these processes are conducted at the OSD and JCS levels. To gain this understanding, highly qualified officers with the potential to fill future critical requirements and acquisition positions should be nominated for key OSD and JCS billets.

- **Increase AMSAA and TRAC base funding to reduce reliance on reimbursable funding from the current 40% to 20%**
- **Increase both AMSAA and TRAC funding by \$10M per year to conduct AoAs**
- **Continue to resource the DA program for data collection and development of scenarios, models and simulations to support systems analysis in stability and irregular warfare operations**
- **Fully support the DoD Human Social Culture Behavior Modeling Program to integrate human behavior into Army models**
- **Develop needed analytic portfolio management tools for the G-8 and CPRs**

Figure 54. Fund AMC and TRADOC Requirements Analysis and Tools

Approximately 40% of AMSAA's and TRAC's funding comes from reimbursement, often from PMs and PEOs, to conduct analyses on specific program issues. While these efforts are important and should not be totally eliminated, the current magnitude of this work precludes use of the analytic workforce when critical mission-related work is required. The base funding of both organizations should only require reimbursement funding of 20% and provide the capability and flexibility to conduct the increased number of quality acquisition-related analyses.

The Army should establish a fund of \$10M each (\$20M total) for TRAC and AMSAA to eliminate the annual shortfall of mission funding for Army AoAs and associated materiel acquisition analyses as requested on 5 October 2010. This is particularly critical as the demand for AoAs has increased.

DA should continue resourcing the collection and analysis of irregular warfare (IW) data and IW modeling incorporating social and behavioral science theories. This work is essential to support the development of both engineering and force-on-force models that properly represent the environments in which Army systems must operate. These models and simulations must be developed to determine capability shortfalls and to assess and justify new materiel and data needs to be collected and prepared for use in models. An annual \$15.8M for this effort was approved by the VCSA in July 2010. This effort should receive high priority and be fully supported, and the resulting work should be closely monitored.

DoD is sponsoring a Human Social Culture Behavior (HSCB) Modeling Program to conduct research necessary to develop tools that reflect the impact of interacting with humans on the battlefield. These programs and additional work need to be fully supported by the Army to improve their models to represent today's operational environment.

The Army should develop/obtain the necessary quantitative analytic tools to assess the relative value of components of a portfolio and to assess the relative value of a new, proposed system. Moreover, the Army should develop/obtain tools to quantitatively examine the comparative value among portfolios in providing essential warfighting capabilities. This is essential for G-8, CPR, POM and budget deliberations, and to justify modernization investment strategies to OSD and the Congress.

- **Fence the funds or fund with a 'capital account' six or less key ACAT I programs**
- **Invest upfront for Integrated Process and Product Development (IPPD) and O&S cost reduction to generate future production and sustainment cost savings**
- **Increase the use of multi-year contracts on stable programs**
- **Focus development and production on what the operational force needs fielded in the next 7 years**

Figure 55. Reduce Funding Instability

The funding for six or less key ACAT I programs, like the Ground Combat Vehicle, should be fenced or funded by a capital account (see finding in section II.4).

All high-priority programs with stable requirements, configurations and prices should be considered for multi-year procurement (MYP) contracts; i.e., awarding one contract for three to four years of production. Given the cost penalties for terminating a MYP contract early, MYP contracts should only be awarded when savings of at least 10% can be attained and the program will survive DoD and Army budget cuts.

The Army should invest upfront for IPPD and O&S cost reduction to enable reinvestment of the savings to fully fund future acquisitions. If the Army starts planning now to better forecast and fund the Operations and Maintenance account and better cope with the end of the Iraq and Afghanistan wartime supplemental budgets, it can avoid drastic cuts to weapon systems programs as occurred following Operation Desert Storm.

While the DoD is relatively well resourced during this wartime period, it would be wise to put in place the policy, procedures and practices to greatly improve resource informed requirement priorities and program funding stability. Developmental testers need to be budget conscious and be part of the Big A team. The primary objective of developmental testing should be the determination of whether the system/product meets or betters the exit criteria stated in the contract. The primary operational testing objective should be to enable the OSD Director of Operational Testing and Evaluation to report to Congress that the tested system is operationally suitable and operationally effective. RFP release and contract award can be delayed for a number of reasons. These delays are costly to industry and ultimately the government, both in wasted funds and erosion of confidence and trust and must be minimized.

In the budget deficit environment of the nation, a reduction in the Army's budget can be expected over the next several years. While maintaining a reasonably healthy S&T effort, the Army should focus on weapon system programs that can be achieved with relatively low risk and within a five to seven year time frame. Such programs are the Type 1, 2 and 3 programs described in Figure 41 of this report. These programs have the advantage of a time frame where future requirements and technology assessments can be fairly accurately forecast, which should reduce the likelihood of large cost overruns, schedule slips and cancellations. It should also restore confidence in the Army's requirements and acquisition capability.

IV. IMPLEMENTATION OF RECOMMENDATIONS

The panel recommends the Secretary of the Army charter a Special Task Force, led by the Under Secretary of the Army and the Vice Chief of Staff of the Army, to plan for and oversee expedited implementation of the recommendations in this report. The panel believes that necessary improvement of the Army acquisition process will result only if the recommendations are implemented in their totality.

The panel has provided the following draft implementation plan with recommended individuals or organizations responsible for implementation of the recommendations. The panel will be available to assist the Special Task Force in planning for implementation and is willing to assist the task force leaders in evaluating implementation on a periodic basis. Implementation of the recommendations will result in the following indicators of success:

- A highly skilled workforce with essential tools, processes and effective organizational alignment.
- Quality, resource-constrained requirements approved by the Pentagon within four months.
- Greatly reduced program cost overruns, slippages and terminations.

To Result In

Delivery of Needed Capabilities to Warfighters in a More Timely Manner

SecArmy and CSA Lead				
Recm'd Section	Recommendation	Lead	EDC	Fig #
III				
---	Charter a Task Force co-Chaired by the USA & VCSA to: Ensure the implementation of these recommendations; conduct quarterly progress reviews; and document the costs, savings and improvements derived.	SecArmy	1 mo.	---
III.1	A TRADOC-led Integrated Capabilities Development Team (ICDT) with personnel from the Army Staff and Secretariat, AMC, ATEC and other Army Commands should collaboratively develop requirements documents for AROC approval – Amend AR 71-9 to give the TRADOC CG the authority to task non-TRADOC organizations for ICDT participation – ICDT representatives must have the authority to speak for and commit their organizations	CSA	3 mo.	31
III.1	CSA recommend JCS terminate the current JCIDS process <u>or</u> require collaboration by J-8 and appropriate Joint Staff with the Army during the requirements development process	CSA & G-3, G-8	3 mo.	38

SecArmy and CSA Lead, cont'd

III.1	For key ACAT I programs, establish a STF, chartered by either the CSA or SecArmy, that is – Co-chaired by a TRADOC MG and an acquisition GO/SES technically qualified for the system pursued – Conducted off-site, outside the Washington, DC area, for a finite period of performance – Convened as necessary to prepare for the MS A and B decisions – Organized and populated with experienced, qualified talent, from the Army Secretariat, ARSTAFF, TRADOC, AMC, ATEC and other Army Commands with the authority to commit their organizations – Invite members of the JCS, DOT&E and OUSD(AT&L) as appropriate – Tasked to collaboratively develop and provide to AAE, AMC and TRADOC a comprehensive, consistent set of requirements, acquisition milestone decision products and source selection documents – Used to draft the RFP and assess comments received – Prepared to provide some STF members to serve on the SSEB or SSAC	SA & CSA	3 mo.*	31
III.3	Capability Portfolio Reviews: – The VCSA and the AAE should co-chair Session 1 of the materiel CPRs – Codify the conduct of CPRs in an Army Regulation – Include a requirement to review the interdependencies across portfolios	SecArmy & CSA	6 mo.	47
III.3	Army leadership improve communication with industry	SecArmy	6 mo.	50

* To establish necessary policy and directives

SecArmy and CSA Lead, cont'd				
III.3	VCSA should co-chair the ASARC with the ASA(ALT); ASARC to make appropriate recommendations to the AAE	SecArmy	3 mo.	47
III.4	Direct TRADOC conduct an in-depth review of the required and authorized Capability Development personnel, including scientists and ORSAs and cost analysts at ARCIC, TRAC and Centers of Excellence with a recommended minimum team of 7 ORSA analysts available at each Center of Excellence's CDID; and a minimum of 5 cost analysts at the ARCIC. The Army provide the identified resources.	CSA	1 yr.	51
III.4	Focus development and production on what the operational force needs fielded in the next 7 years	SecArmy & CSA	6 mo.	55

OSD and Congress Lead				
Recm'd Section	Recommendation	Lead	EDC	Fig #
III				
III.1	Request rapid acquisition discretionary funding for ONS to support COCOMs during such periods	USA, ASA(ALT), ASA(FM&C), OSD & Congress	6 mo.	38

OSD and Congress Lead, cont'd

III.2	Limit documents to those shown in the risk management matrix for a given acquisition type	AAE & DAE	6 mo.	43
III.2	Request OSD and the Congress revise the Nunn-McCurdy Act so that a system block improvement or increased procurement quantity will not cause a breach of the Nunn-McCurdy threshold	AAE, USD(AT&L) & Congress	3 mo.	44
III.2	Adhere to TRL definitions to assess technological risk	AAE & DDR&E	3 mo.	44
III.2	Properly define and promulgate Integration Readiness Level (IRL) and Manufacturing Readiness Level (MRL) criteria for use in determining readiness to enter EMD and production	AAE & DDR&E	3 mo.	44
III.2	Re-establish the difference between IRAD and B&P	AAE & DDR&E	6 mo.	46
III.2	Increase Army visibility into contractors' IRAD programs, but site reviews should be to exchange information, not be just a grading exercise	AAE & DDR&E	6 mo.	46
III.2	Build "high walls" around small, critical areas, rather than subjecting commercial products to ITAR restrictions	AAE, DDR&E & Congress	1 yr.	46
III.2	Continue strong participation in the export control process	AAE & Congress	1 yr.	46

OSD and Congress Lead, cont'd				
III.3	Seek OSD and Congressional approval of PEO Soldier and Small Unit recommended consolidation and alignment of funding lines for his programs	AAE, ASA(FM&C), OSD & Congress	6 mo.	47
III.3	ASA(ALT) request the ASD(Acquisition) direct DAU to establish an accountability course for PEOs, PMs, TCMs and other personnel involved in the 'Big A'	ASA(ALT) & ASD(Acquisition)	3 mo.	50
III.4	Request a DAU course for PEOs, PMs and contracting officers on how industry is run, including familiarity with the financial 'top' and 'bottom' lines	ASA(ALT) & ASD(Acquisition)	3 mo.	53
III.4	Fence the funds or fund with a 'capital account' six or less key ACAT I programs	SecArmy, CSA & DepSecDef	6 mo.	55
III.4	Increase the use of multi-year contracts on stable programs	AAE, ASA(FM&C), USD(AT&L) & Congress	1 yr.	55

USA & VCSA Lead				
Recm'd Section III	Recommendation	Lead	EDC	Fig #
III.1	Institutionalize rapid acquisition in policy guidelines and amend AR 71-9 to support rapid acquisition in response to ONS from COCOMs during quiescent periods	USA, VCSA & G-3	6 mo.	38
III.3	Rebuild the highly efficient and effective triad of the military DASC, SSO and PAE AO at the O-4/O-5 level (no contractors), with 'knowledge authority' and locate in the Pentagon	USA & VCSA	1 yr.	49
III.3	CMO promulgate policy and develop metrics for line and staff accountability in the 'Big A'	USA & VCSA	6 mo.	50
III.3	Clarify 'inherently governmental position' criteria and reduce 'gray area' acquisition positions	USA	6 mo.	50
III.4	Complete implementation of Gansler recommendations, to include recommended improvements in services contracting	USA	6 mo.	52
III.4	Reestablish the position of the Deputy Undersecretary of the Army for Operations Research (DUSA(OR)) and staff the office with 9 people, including 3 military analysts	USA	3 mo.*	51
III.4	Continue to resource the DA program for data collection and development of scenarios, models and simulations to support systems analysis in stability and irregular warfare operations	VCSA	1 yr.	54

* To establish necessary policy and directives

USA & VCSA Lead, cont'd				
III.4	Develop needed analytic portfolio management tools for the G-8 and CPRs	VCSA & G-8	3 mo.*	54
III.4	Establish data-informed process for balancing acquisition workforce requests, supply and quality	USA	1 yr.	52

* To establish necessary policy and directives

ASA(ALT)/AAE & VCSA Lead				
Recm'd Section III	Recommendation	Lead	EDC	Fig #
III.1	Reduce the current practice of serial (saw-tooth) TRADOC-Army-Joint staffing and approval of requirements, acquisition and testing documents	ASA(ALT) & VCSA	6 mo.	38
III.2	Give priority to vertical technology insertion (VTI) and horizontal technology integration (HTI) of proven advanced technologies via evolutionary acquisitions with growth capacity (Types 1-3)	AAE & VCSA	6 mo.	44
III.3	Improve the alignment among the PEO structure, Equipping PEG, BOSs, CPRs and TRADOC Centers of Excellence	AAE & VCSA	6 mo.	47
III.3	Set time limits for document review and decision - Hold staff accountable	AAE & VCSA	3 mo.*	49

* To establish necessary policy and directives

ASA(ALT)/AAE & VCSA Lead, cont'd				
III.3	Make PMs lead/accountable for acquisition logistics during development through successful IOC fielding and LCMCs lead/accountable for post-fielding operational logistics'	AAE & VCSA	3 mo.*	49
III.4	Increase AMSAA and TRAC base funding to reduce reliance on reimbursable funding from the current 40% to 20%	ASA(ALT), ASA(FM&C) & G-8	1 yr.	54
III.4	Increase both AMSAA and TRAC funding by \$10M per year to conduct AoAs	ASA(ALT), ASA(FM&C) & G-8	1 yr.	54
III.4	Provide Army Acquisition Corps (AAC) members an opportunity for re-greening through full resident participation at AWC and CGSC, and short assignment of potential PMs to staff positions in operational units	VCSA & ASA(ALT) MILDEP	3 mo.*	53
III.4	Actively solicit assignment of highly qualified Army officers to key OSD and JCS positions	VCSA, ASA(ALT) MILDEP & G-1	1 yr.	53

* To establish necessary policy and directives

ASA(ALT)/AAE & VCSA Lead, cont'd				
III.4	Increase AAC members' experience and understanding of high technology by: – Assigning more officers to DARPA , NASA and national labs to serve as Program/Project Managers – Providing career path, training, and supporting sponsor to officers assigned to DARPA, NASA and national labs	VCSA, ASA(ALT) MILDEP & G-1	6 mo.	53
III.4	Increase the authorizations and fill of FA 49 military analysts needed to support Army acquisition	VCSA, G-3 & G-8	6 mo.	51
III.4	Establish a Center for Army Acquisition Lessons Learned within the Center for Military History	AAE & VCSA	1 yr.	51
III.4	Require an AAR after every milestone decision and program critical event, and a lessons learned report after program MS C or cancellation	AAE & VCSA	3 mo.	51
III.4	Fully support the DoD Human Social Culture Behavior Modeling Program to integrate human behavior into Army models	ASA(ALT) & VCSA	1 mo.*	54

* To establish necessary policy and directives

ASA(ALT)/AAE Lead				
Recm'd Section III	Recommendation	Lead	EDC	Fig #
III.2	Promulgate acquisition strategy templates for the 6 types of acquisition programs to manage by risk as well as scope.	AAE	6 mo.	43
III.2	Require the PM to identify to the ASARC which type of program acquisition strategy is proposed, and justify any deviation from the attributes for that type.	AAE ICW DAE	6 mo.*	44
III.2	Restrict Type 5 acquisitions to only 'game changing' military capabilities	AAE ICW DAE	3 mo.	43
III.2	Expand use of fixed price and incentive fee contracts consistent with risk type	AAE	6 mo.	43
III.2	Encourage and fund competitive pre-MS B prototyping of systems, subsystems and components	AAE	6 mo.	43
III.2	Expand the acquisition of Technology Data Packages (TDP) during the development stage when the government has the most leverage, and compete using the TDP during system acquisition and sustainment phases consistent with the estimated risk-reward	AAE	3 mo.*	43
III.2	Emphasize more Type 1, 2 & 3 acquisition for shorter cycles, more stability, rapid tech insertion and reduced 'requirements/technology creep'	AAE	1 mo.*	43

* To establish necessary policy and directives

ASA(ALT)/AAE Lead, cont'd				
III.3	Re-designate PEO Soldier to be PEO Soldier and Small Unit	AAE	3 mo.	47
III.3	Synchronize the ASTAG and ASTWG cycle with the POM submission cycle	ASA(ALT)	6 mo.	47
III.3	Stress the importance of having value-added reviews and hold IPTs and their individual members accountable for their actions	AAE	6 mo.	50
III.3	Consider a “partnering” relationship with industry to solve issues short of formal protests	AAE & OGC	6 mo.	50
III.4	Improve quality of Program, Project and Product management by selecting: – At grade levels consistent with DA Pamphlet 70-3 – Only PMs and PEOs with expertise and experience in their product lines – A PM for an ACAT I System at MS A – A GO PM for GCV and similarly complex ACAT 1 programs	ASA(ALT) MILDEP & G-1	3 mo.*	53
III.4	Establish an ASA(ALT) Deputy Assistant Secretary for Services with a small staff for services acquisition, with similar responsibilities, authorities and accountability to those of the ASA(ALT) Deputy for Weapon Systems (being implemented)	ASA(ALT)	3 mo.	52

* To establish necessary policy and directives

ASA(ALT)/AAE Lead, cont'd				
III.4	Fully support the ASA(ALT) initiative to add 'Contracting for the Non-contracts Professional Course' recently added to the HQDA 'How the Army Runs' Course	ASA(ALT)	On-going	52
III.4	Invest upfront for Integrated Process and Product Development (IPPD) and O&S cost reduction to generate future production and sustainment cost savings	AAE & ASA(FM&C)	3 mo.	55

AAE/ASA(ALT), CG AMC & CG TRADOC Lead				
Recm'd Section III	Recommendation	Lead	EDC	Fig #
III.1	Synchronize TRADOC and Army requirements approval, MDD, MS A and MS B decisions to align with the DA POM and budget development schedules	ASA(ALT) & CG TRADOC	6 mo.	38
III.2	Limit the number of KPPs and KSAs	TRADOC, ASA(ALT) & AMC	6 mo.	40
III.2	Establish threshold and objective values for KSAs to enable trade-offs	TRADOC, ASA(ALT) & AMC	6 mo.	40

AAE/ASA(ALT), CG AMC & CG TRADOC Lead, cont'd

III.2	Obtain initial system cost parameters from G-8 and DASA(CE) prior to MDD	ASA(ALT), DASA(CE) & G-8	1 yr.	40
III.2	Include MANPRINT metrics and considerations in Systems Engineering Plan and AoA	ASA(ALT), G-1, & AMC	6 mo.	40
III.2	Involve test community in developing and costing the test strategy before MS A	AMC & ATEC	3 mo.	40
III.3	The LCMC CGs should retain their - Head Contracting Authority (HCA) role - Depots, Integrated Materiel Management Center (IMMC), and Item Manager functions	CG AMC	6 mo.	49

AAE/ASA(ALT), CG AMC & CG TRADOC Lead, cont'd

III.3	Disestablish RDECOM and return the RDECs to the LCMC Commanders – Establish a MG or SES 5 Executive Director for RDA reporting directly to the CG AMC – Annually review Labs and RDECs to eliminate low value added, duplicate efforts – Use the 332 RDECOM positions saved to resource the additional TRADOC and AMSAA ORSA positions, the Directorate for Advanced Systems at AMRDEC, TARDEC, CERDEC, NSRDEC and ARL, and military DASCs – Disposition of ARL and ARO should be determined by the on-going ASA(ALT) study	– CG AMC – CG AMC – CG AMC – ASAALT & CG AMC	– 1 yr. – 1 yr. – 1 yr. – 3 mo.	49
III.4	Establish and resource a Directorate for Advanced Systems (DAS) at the AMRDEC, CERDEC, TARDEC and Natick Soldier RDEC	CG AMC	1 yr.	52
III.4	Assign a Concept Manager from the PEO or DAS prior to MSA for ACAT I programs	AAE & AMC	6 mo.	52
III.4	Increase the number of qualified systems engineering, cost estimating, quality assurance and ORSA personnel in the 'Big A'	AAE, CG AMC & CG TRADOC	2 yr.	52
III.4	Leverage FFRDCs and UARCs to make up for the shortfalls in the Army's system engineering and analytic capabilities until the bench is replenished	AAE, CG AMC & CG TRADOC	6 mo.	52

AAE/ASA(ALT), CG AMC & CG TRADOC Lead, cont'd

III.4	AMC establish a cadre of best practitioners experienced in establishing and conducting SSEBs. This cadre should be a cell in AMC HQ that deploys to form and serve as the leadership for ACAT I SSEBs and is responsible for the lessons learned during SSEBs.	CG AMC	6 mo.	52
III.4	Improve qualifications of TRADOC Capability Managers (TCM) by: – Selecting TCMs with operating force experience – Requiring attendance at the two-week resident Capability Development Course or its equivalent – Assigning a Colonel with operating force experience related to the appropriate capability need for ACAT I programs and limiting his scope to only this program – Funding with TRADOC mission funding	CG TRADOC & G-1	6 mo.*	53
III.4	Combine analytical capability within AMC (AMSAA, SLAD, LOGSA) into a single organization reporting to the AMC Command Group – Provide a 15 person analytic cell from this organization at AMC headquarters – Increase the military analysts within AMSAA to 15 – Use management spaces saved by the organizational integration to increase the quality and quantity of analysis	CG AMC	1 yr.	51

* To establish necessary policy and directives

APPENDIX A. ADDITIONAL FIGURES

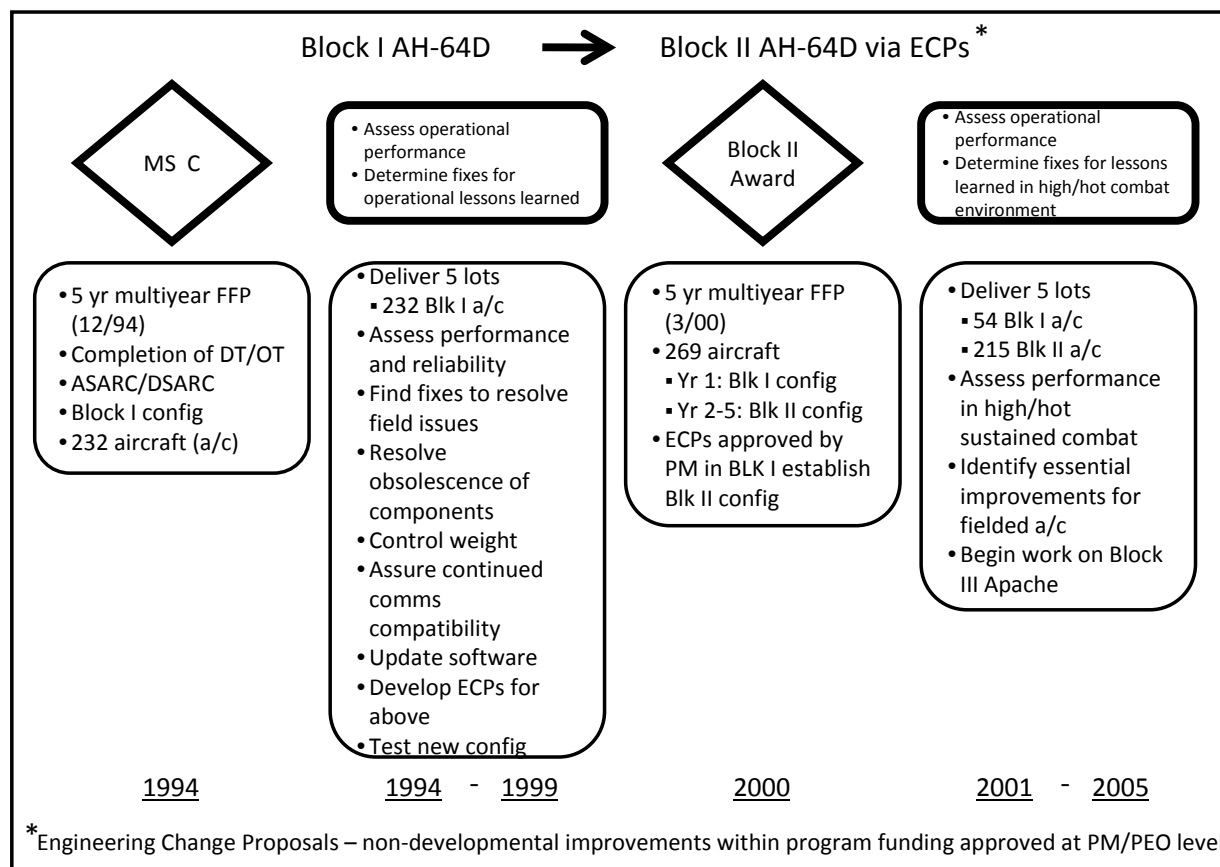


Figure A.1. Type I Exemplar – AH64D Apache Block II

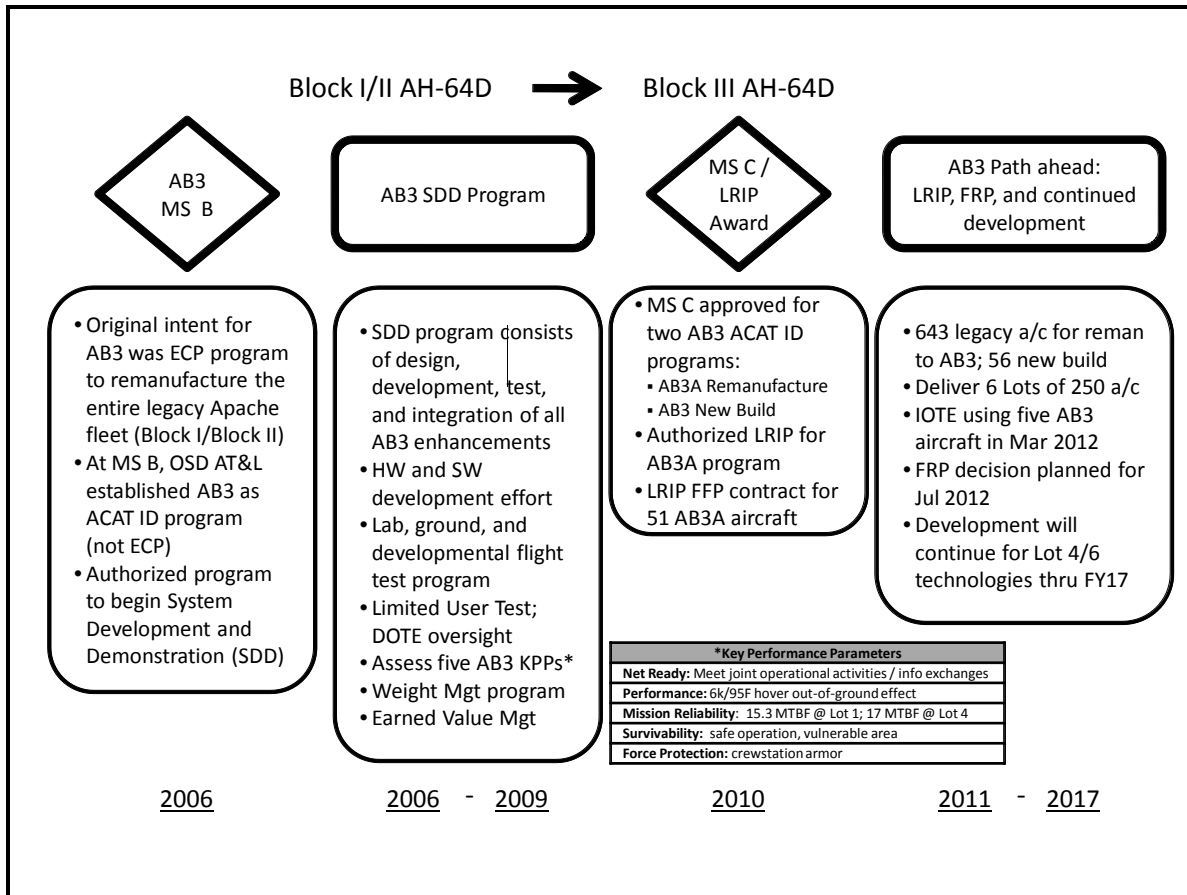
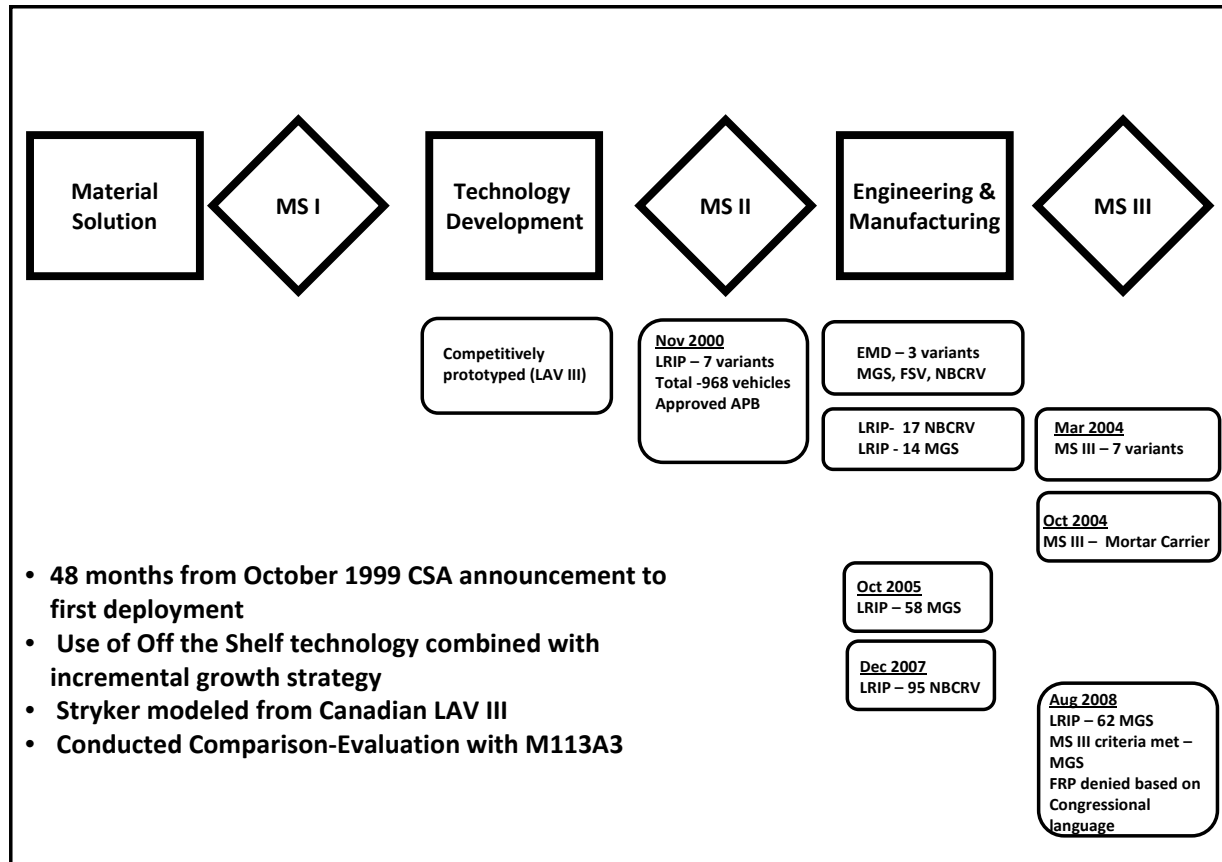


Figure A.2. Type II Exemplar – AH64D Apache Block III (AB3)



Ref 260

Figure A.3. Type III Exemplar – Stryker

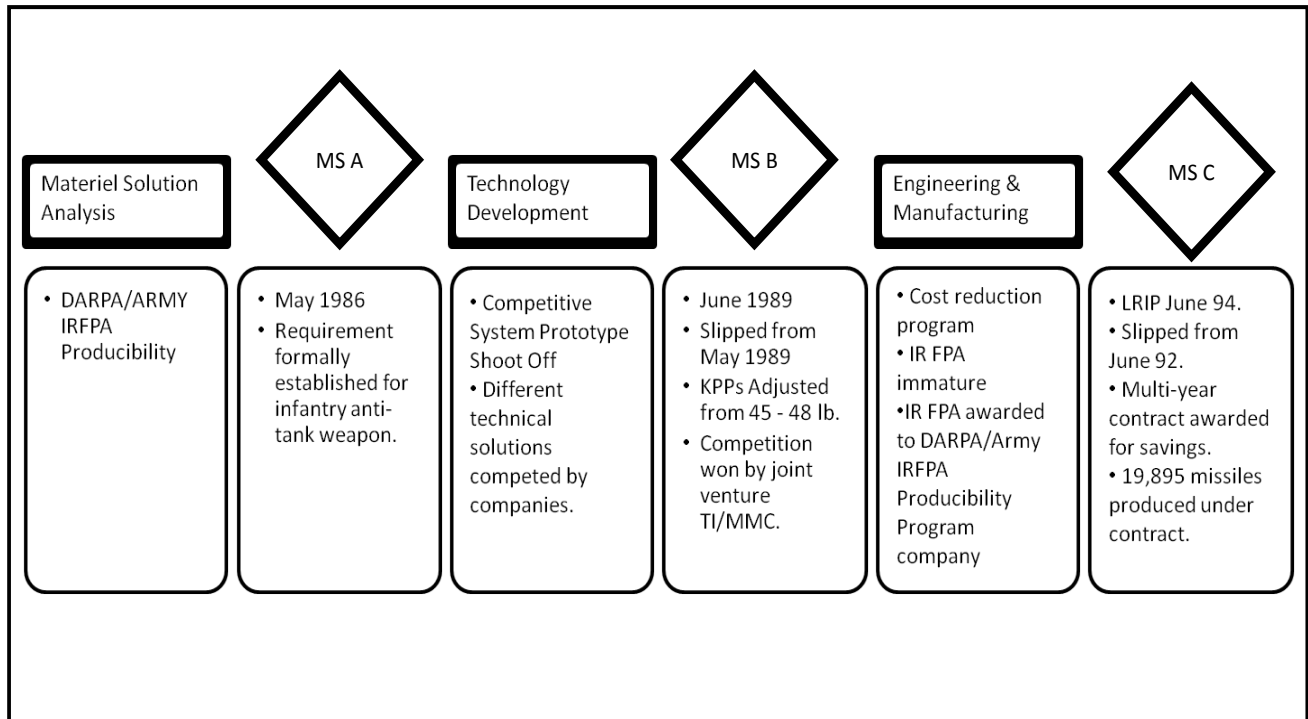


Figure A.4. Type IV Exemplar - Javelin

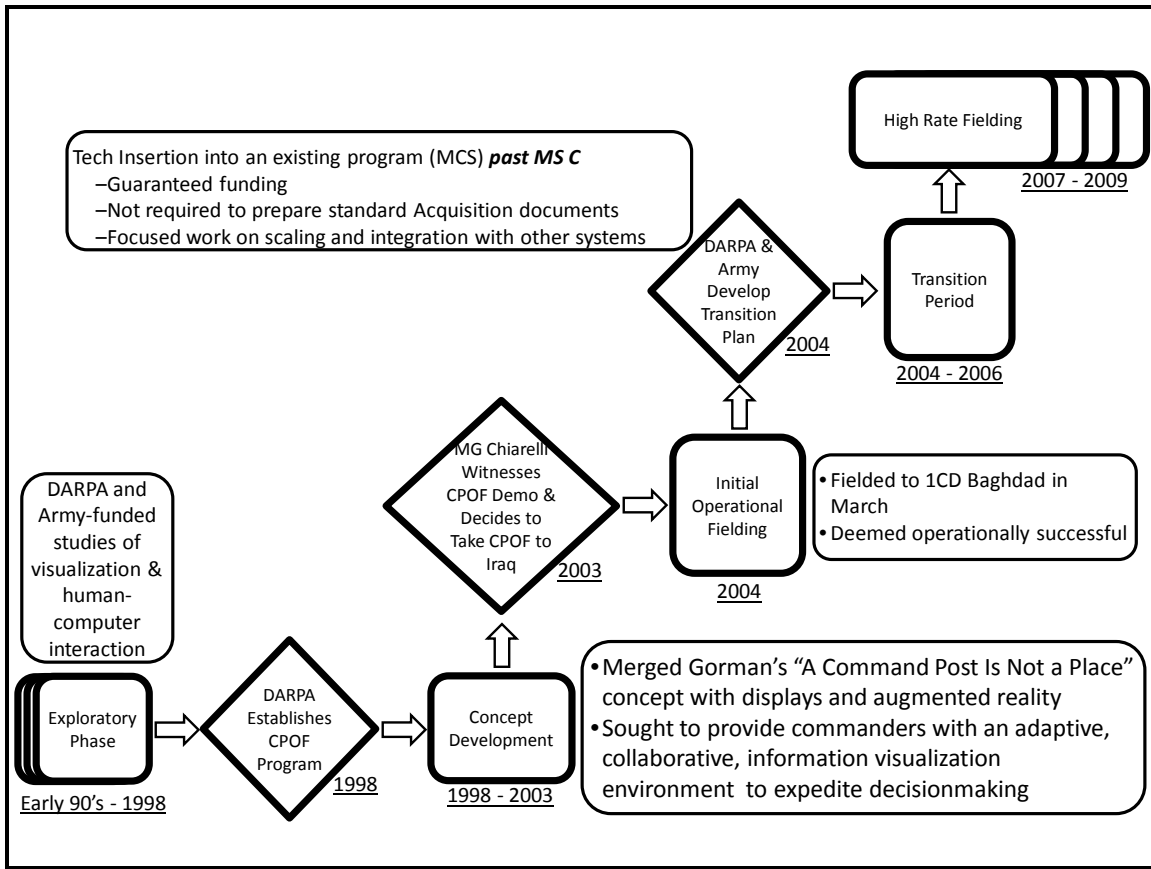


Figure A.5. Type RA Exemplar – Command Post of the Future

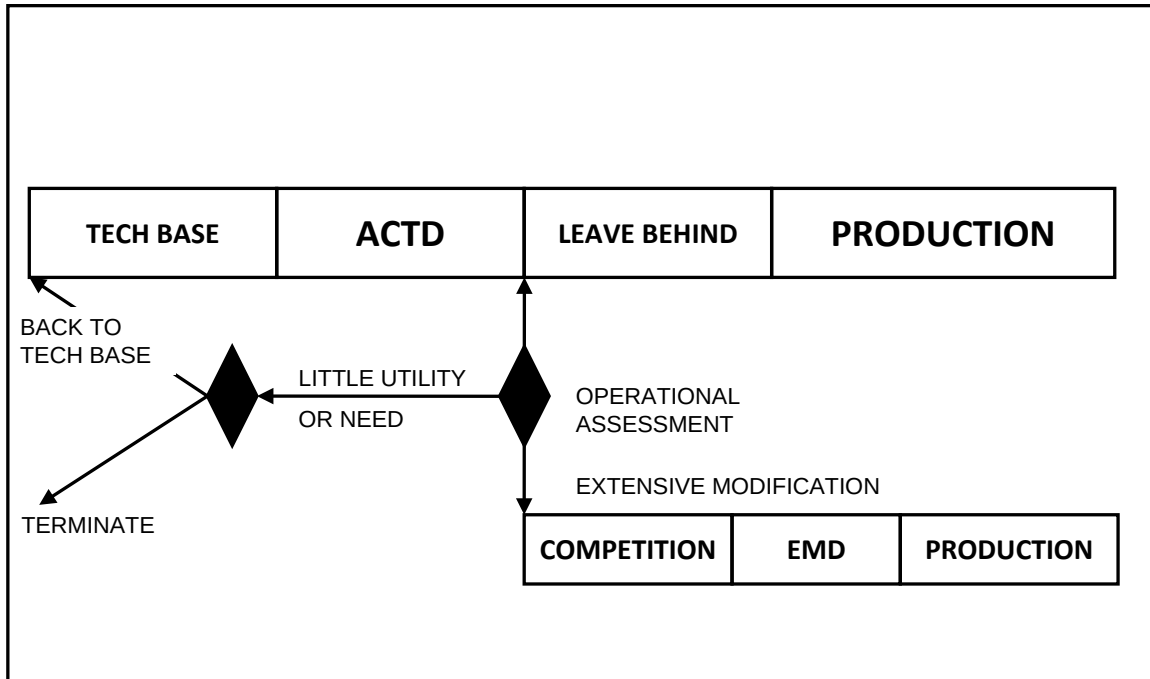


Figure A.6. ACTD Process

Technology Readiness Level	Description
1. Basic principles observed and reported.	Lowest level of technology readiness. Scientific research begins to be translated into applied research and development. Examples might include paper studies of a technology's basic properties.
2. Technology concept and/or application formulated.	Invention begins. Once basic principles are observed, practical applications can be invented. Applications are speculative and there may be no proof or detailed analysis to support the assumptions. Examples are limited to analytic studies.
3. Analytical and experimental critical function and/or characteristic proof of concept.	Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.
4. Component and/or breadboard validation in laboratory environment.	Basic technological components are integrated to establish that they will work together. This is relatively "low fidelity" compared to the eventual system. Examples include integration of "ad hoc" hardware in the laboratory.
5. Component and/or breadboard validation in relevant environment.	Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so it can be tested in a simulated environment. Examples include "high fidelity" laboratory integration of components.
6. System/subsystem model or prototype demonstration in a relevant environment.	Representative model or prototype system, which is well beyond that of TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high-fidelity laboratory environment or in simulated operational environment.
7. System prototype demonstration in an operational environment.	Prototype near, or at, planned operational system. Represents a major step up from TRL 6, requiring demonstration of an actual system prototype in an operational environment such as an aircraft, vehicle, or space. Examples include testing the prototype in a test bed aircraft.
8. Actual system completed and qualified through test and demonstration.	Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental test and evaluation of the system in its intended weapon system to determine if it meets design specifications.
9. Actual system proven through successful mission operations.	Actual application of the technology in its final form and under mission conditions, such as those encountered in operational test and evaluation. Examples include using the system under operational mission conditions.

Ref 265

A.7. Technology Readiness Level Definitions

APPENDIX B. SUPPORTING INFORMATION

B.1 Lost Opportunities: Army DT&E 1995 – 2009

The Army spent 1/4th of its DT&E* money on programs that were ultimately killed, averaging \$1.2 billion annually in lost investments - even before the FCS cancellation.

Terminated Programs* (BY10 \$M)	Termination Year	DT&E Sunk Costs/Program	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
FCS	2009	\$19,033	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$38	\$686	\$1,834	\$2,861	\$3,473	\$3,522	\$3,336	\$3,283
Armed Reconnaissance Helicopter	2009	\$535	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$48	\$94	\$196	\$169	\$28
Land Warrior	2007	\$796	\$0	\$60	\$63	\$48	\$102	\$69	\$71	\$70	\$62	\$88	\$84	\$51	\$28	\$0	\$0
Aerial Common Sensor	2006	\$479	\$0	\$0	\$0	\$0	\$0	\$8	\$16	\$17	\$67	\$121	\$141	\$51	\$24	\$13	\$21
Joint Common Missile	2005	\$334	\$0	\$0	\$0	\$0	\$0	\$0	\$6	\$19	\$32	\$102	\$123	\$27	\$25	\$0	\$0
Comanche	2004	\$5,906	\$333	\$388	\$376	\$302	\$393	\$499	\$643	\$843	\$965	\$1,163	\$0	\$0	\$0	\$0	\$0
LOSAT	2004	\$124	\$0	\$0	\$0	\$0	\$0	\$0	\$30	\$29	\$12	\$33	\$19	\$0	\$0	\$0	\$0
ATACMS BAT	2003	\$1,625	\$278	\$210	\$209	\$279	\$162	\$168	\$117	\$126	\$65	\$11	\$2	\$0	\$0	\$0	\$0
Crusader	2002	\$2,788	\$267	\$305	\$292	\$364	\$354	\$308	\$407	\$490	\$0	\$0	\$0	\$0	\$0	\$0	\$0
SADARM	2002	\$124	\$20	\$13	\$12	\$13	\$37	\$29	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Stinger RPM Block II	2001	\$123	\$21	\$23	\$20	\$10	\$6	\$32	\$6	\$5	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Wolverine Heavy Assault Bridge	2001	\$74	\$16	\$16	\$14	\$14	\$14	\$1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Grizzly Breacher	2001	\$280	\$26	\$43	\$40	\$50	\$69	\$51	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Armored Gun System	1996	\$34	\$34	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DT&E Sunk Costs/Year		\$32,255	\$994	\$1,058	\$1,026	\$1,082	\$1,136	\$1,166	\$1,296	\$1,636	\$1,891	\$3,352	\$3,278	\$3,696	\$3,795	\$3,518	\$3,332
Total DT&E		\$98,001	\$4,200	\$4,094	\$4,213	\$4,238	\$5,148	\$5,063	\$5,277	\$5,918	\$6,245	\$8,579	\$8,290	\$8,824	\$8,919	\$9,905	\$9,089
Sunk Costs as % of Total		32.9%	23.7%	25.8%	24.4%	25.5%	22.1%	23.0%	24.6%	27.6%	30.3%	39.1%	39.5%	41.9%	42.5%	35.5%	36.7%

Ref 172

* DT&E = RDT&E – S&T

* Only 14 of the 22 canceled programs are listed in the table. Four programs were omitted because their termination occurred before 1995 (Wolverine Heavy Assault Bridge, Regency Net, Single Channel Objective Tactical Terminal, Line of Sight – Forward- Heavy). Five other programs were part of the FCS program, and are identified collectively here as FCS (FCS Manned Ground Vehicle, FCS Non Line of Sight Cannon, FCS Class II and III UAVs, FCS Class IV UAV, Non Line of Sight – Launch System).

Figure B.1 displays the DT&E funding dedicated to cancelled programs, by year, from 1995 to 2009. DT&E differs from RDT&E by excluding S&T funding. All amounts are listed in Army Budget Year 2010 dollars. Data is drawn from OASA(ALT)'s WARBUCS database.

FCS can overshadow debates about challenges in the Army acquisition system. It is important to note that the Army's challenges pre-date FCS. Every year since 1996 the Army has spent more than \$1 billion annually on programs that were ultimately cancelled. Every year we have data for the Army has spent at least 22% of its DT&E money on programs that were ultimately cancelled. Since 2004 at least 35% of Army DT&E funding has gone to cancelled programs.

There are different causes for each program cancellation, and for each program conflicting explanations. But broadly it can be said that the Army has not succeeded as an institution in effectively integrating its understanding of the strategic and fiscal environment with its acquisition investment strategy and management practices.

B.2 FLIR SPECIAL TASK FORCE

(Ref 103)

08/24/98 11:18 PM-NU RSTA - 703 878 8817
08/24/98 07:56 FAX 703 704 1041 COUNTERMINE DIV

NO. 004 007
0002

UNCLASSIFIED E F T O

01 04 081545Z FEB 93 RP RR CEEC

DA WASHDC //SARD-ZB//
CDRTRADOC FT MONROE VA //ATCG-CG//
CDRUSACAC FT LEAVENWORTH KS //ATZL-CG//
CDRCECOM FT MONMOUTH NJ //ANSEL-CG//
CDRUSACASCOM FT LEE VA //ATCL-CG//
CDRANC ALEX VA //ANC-CG//
COMDTINPSCH FT BENNING GA //ATSH-CG//
PEGAV ST LOUIS MO //SFAE-AV//
PEGASH WARREN MI //SFAE-ASM//
PEOMSL REDSTONE ARSENAL AL //SFAE-MSL//
PEGIEW VHS WARRENTON VA //SFAE-IEW//
PEGAR PICATINNY ARS NJ //SAFE-AR//
DIR NVEOB LAB FT BELVOIR VA //ANSEL-RD-NV-B//

UNCLAS E F T O FOUO

SUBJ: SECOND GENERATION COMMON MODULE FLIR SPECIAL TASK FORCE
1. THE CSA HAS ENDORSED THE CONCEPT OF HORIZONTAL TECHNOLOGY
INTEGRATION OF SECOND GENERATION FLIR (SGP) TECHNOLOGY ACROSS THE
ARMY TO MAINTAIN THE EDGE AT NIGHT WE CURRENTLY ENJOY OVER OUR
POTENTIAL ADVERSARIES. CONSISTENT WITH THE DCSOPS/SARDA RECENT

COMEBACK COPY TO HQDA (SARD-ZT)

GEORGE T SINGLEY SARD-ZT 71646
BG R ADAMS DAMO-PD 50527

W F FORSTER, LTC SARD-ZB 70356

W F Forster

UNCLAS E F T O

09/24/99 11:18 PM-MN: BETA - 703 578 5517
09/24/99 07:58 FAX 703 704 1041 COUNTERMINE DIV

10/00/99 00:00
0003

UNCLASSIFIED E F T O

02 04

PROPOSAL TO THE CHIEF. SUBJECT DA SPECIAL TASK FORCE (STF) IS
HEREBY ESTABLISHED TO DEVELOP THE FRAMEWORK FOR PROGRAM EXECUTION.
THIS STF WILL:

- A. DEVELOP THE SGF HORIZONTAL TECHNOLOGY INTEGRATION (HTI) MODERNIZATION PLAN (RESOURCE CONSTRAINED).
- B. PREPARE AND SEEK DCSOPS APPROVAL OF AN INDEPENDENT, UMBRELLA OPERATIONAL REQUIREMENT DOCUMENT, INCLUDING MISSION NEED STATEMENT UPDATE.
- C. FOLLOWING VALIDATION OF THE ORD, REQUEST THE ARMY ACQUISITION EXECUTIVE APPOINT THE MILESTONE DECISION AUTHORITY FOR ACQUISITION STRATEGY APPROVAL, ESTABLISHMENT OF EXIT CRITERIA AND MAKE RISK MANAGEMENT DECISIONS.
- D. DEVELOP A BASELINE COST ESTIMATE AND ESTABLISH A HORIZONTAL RBD TO ENSURE STABLE FUNDING DURING THE PPBS; AND
- E. PREPARE DRAFT ACQUISITION STRATEGY, ACQUISITION PLAN AND REQUEST FOR PROPOSAL(S) (RFP). THE STF WILL ALSO ASSESS COMMENTS RECEIVED FROM THE DRAFT RFP AND PREPARE THE FINAL RFP CONSISTENT WITH ALL THE FOREGOING. FOLLOWING RELEASE OF THE RFP, THE STF WILL EVOLVE TO FORM THE NUCLEUS FOR THE SOURCE SELECTION EVALUATION BOARD REQUIRED TO EVALUATE PROPOSALS RECEIVED.

2
UNCLAS E F T O

09/24/99 11:18 PM-MN RSTA - 703 676 5513
08/24/88 07:56 FAX 703 704 1041 COUNTERMINE DIV

10/20/99 01:05
0004

UNCLAS E F T O

03 04

2. REQUEST THE STF BE CHAIRED BY MG WHITE, DIRECTOR, DISMOUNTED BATTLE SPACE BATTLE LAB (D-MTD BL). REQUEST HIS DEPUTY BE AN SES OR GM-15 FROM CECOM'S NIGHT VISION ELECTRONIC SENSORS DIRECTORATE (NVEDS), FT BELVOIR, VA. PROPOSE STF CONSIST OF FOUR TEAMS: TECHNICAL, PROGRAM MANAGEMENT, PROCUREMENT AND OPERATIONAL SUITABILITY WORKING IN CONCERT WITH THE D-MTD BL.

3. PROPOSE THE FOLLOWING TEAM LEADERSHIP:

TEAM	LEAD	GRADE (MIN)
TECHNICAL (INCLUDING ILS)	NVEDS	GM-15
PROGRAM MGT (INCLUDING COST)	PM NVEDS	COL
PROCUREMENT	AMC	LTC/GM-14
OPN'L SUITABILITY	TRADOC	COL

IT IS ENVISIONED THAT THE STF NOT EXCEED A TOTAL OF 30 PEOPLE WITH PLACE OF DUTY AT FT BENNING, GA. REQUEST STF CDR PROVIDE SUITABLE WORKING ACCOMMODATIONS AND ADMINISTRATIVE SUPPORT TO THE STF SO THEY MAY BE OPERATIONAL IN FEBRUARY 1993. FURTHER SUGGEST THAT TRADOC CONSIDER FORSCOM PARTICIPATION IN THE OPERATIONAL

2

UNCLAS E F T O

08/24/99 11:18 PM-HQ PSTA - 703 676 5813
08/24/99 07:57 FAX 703 704 1041 COUNTERNINE DIV

005

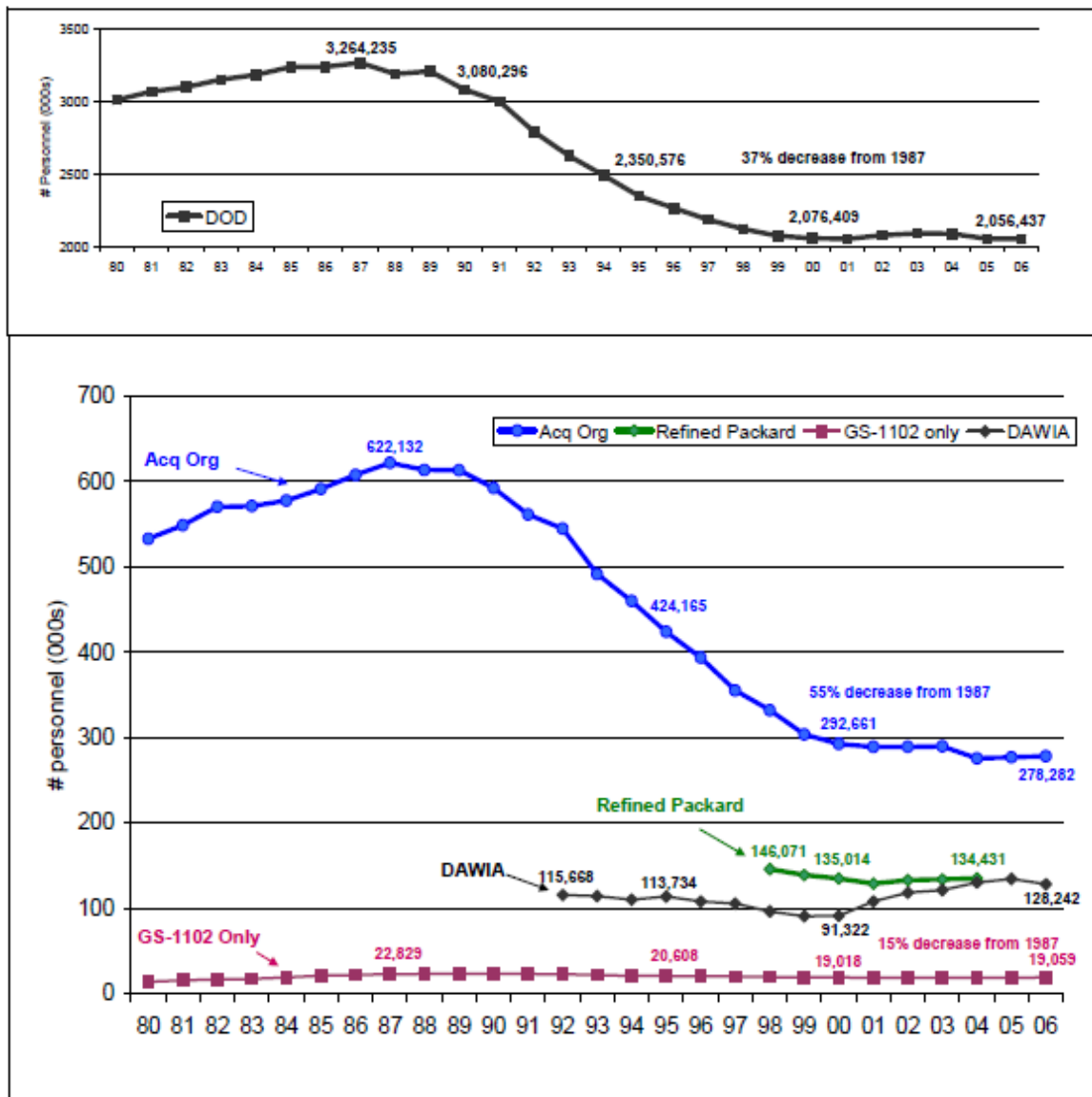
UNCLASSIFIED E F T O

04 04

- SUITABILITY TEAM. STF MEMBERSHIP SHOULD INCLUDE AT LEAST REPRESENTATIVES FROM THE FOLLOWING PEO'S: IEW, ASM, AVIATION, TACTICAL MISSILES AND OTHERS DEEMED APPROPRIATE.
4. FUNDING FOR TDY EXPENSES AND EXTRAORDINARY ADMINISTRATIVE SUPPORT FOR THE STF WILL BE PROVIDED BY NYEED FROM SGF PROJECT FUNDS. SALARIES MUST BE BORNE BY THE PARENT ORGANIZATION.
5. THE ARMY MUST CONTINUE TO OWN THE NIGHT. THIS IS A DECISIVE TECHNOLOGY REQUIRING INTENSIVE MANAGEMENT; HENCE THE NEED TO MOVE OUT IN A FOCUSED WAY. IN MANY RESPECTS THIS EFFORT AND THAT OF COMBAT ID ARE SETTING THE STANDARD FOR HOW THE ARMY WILL MAINTAIN ITS WINNING EDGE VIA HORIZONTAL TECHNOLOGY INTEGRATION.
6. THIS MSG IS CONCURRED IN BY MG GARNER, ODCSOPS, DAMO-PD.
7. POC'S FOR THIS ACTION ARE BG ADAMS, MODA, DAMO-PD, DSN 225-0527, COMMERCIAL (703) 695-0527, AND GEORGE T. SINGLEY, OASACRDA, SARD-ZT, DSN 227-1646 OR COMMERCIAL (703) 697-1646.
8. REPLY REQUESTED.

UNCLAS E F T O

B.3 ACQUISITION WORKFORCE



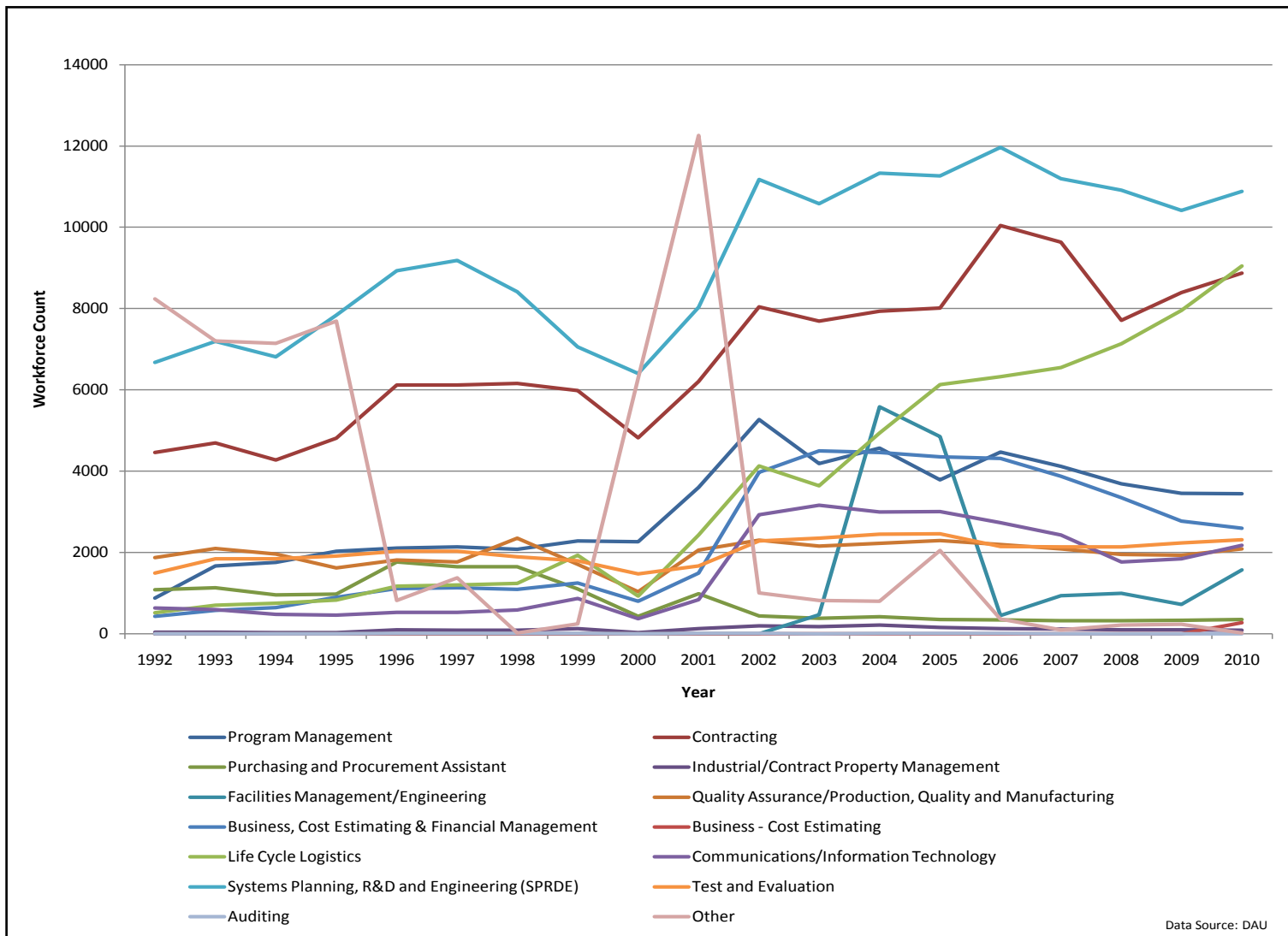
Ref 71

B.3.1 Types of DoD Acquisition Workforce Counts

Figure B.3.1 from DAU's Defense Acquisition Structures and Capabilities Review (2007) highlights the scale of the difference between acquisition workforce count methodologies.

Beginning in 2000 the Department of Defense began shifting from the old DAWIA count methodology to the Refined Packard count, partly due to concerns over the reliability of the old methodology. That coding change makes it appear to anyone examining Defense Manpower Data Center's data on the Army acquisition workforce (see Figures B.3.2 – 3) that the workforce is growing, though there is no direct way of judging whether the number of personnel actually involved in acquisition duties increased or decreased over that same period. A cursory examination of the acquisition organizational workforce count suggests a decline in the workforce over the same period.

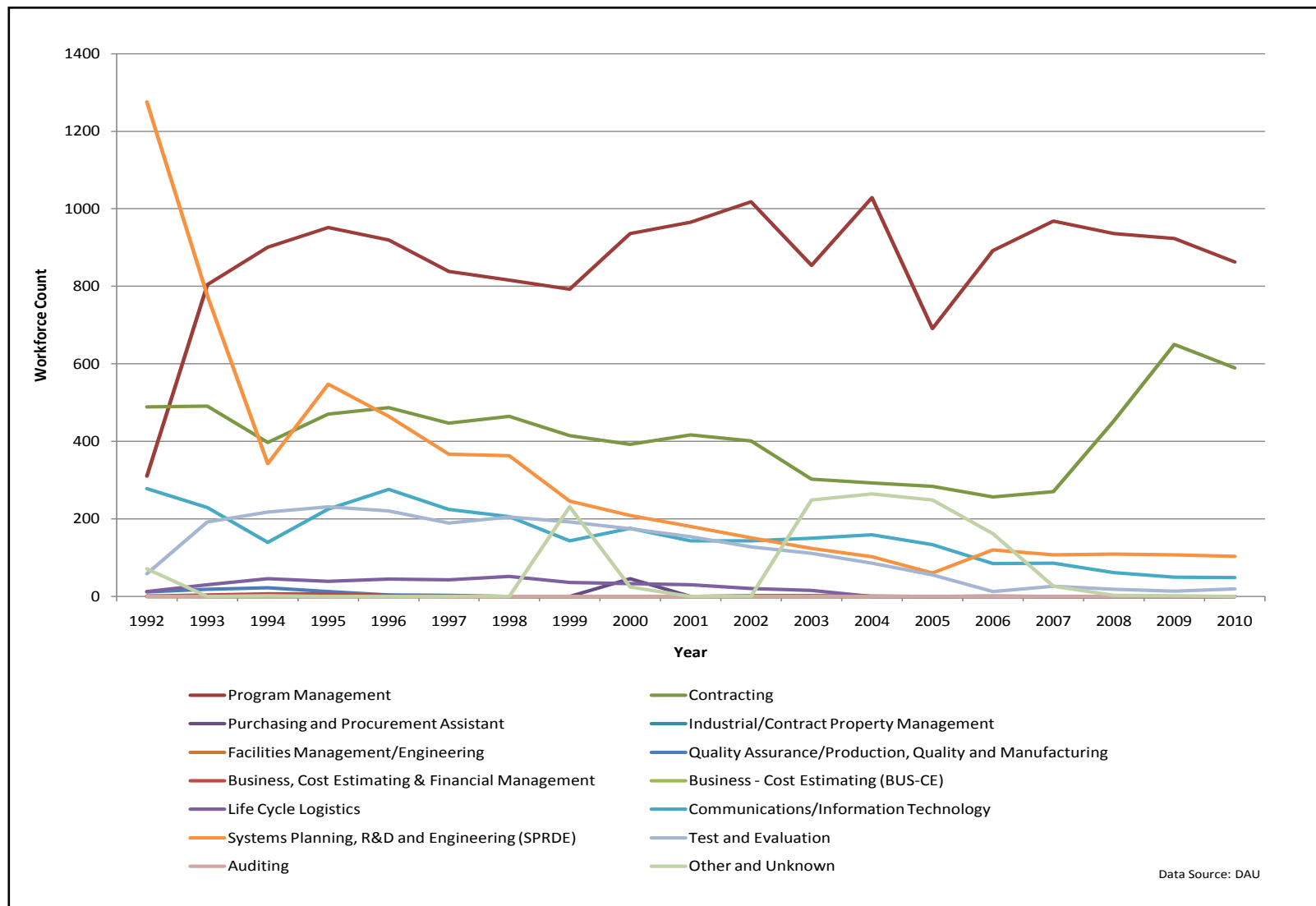
Unfortunately even the standard organizational workforce count can be misleading. Though the large decline in the number of personnel in acquisition organizations would indicate a significant loss in capability, much of the decline from the early 1990s is actually an artifact of supply depots being shifted from AMC to the Defense Logistics Agency (DLA). Though the organizational workforce has shrunk, so has its mission, while the Army still has access to the same capabilities through DLA, even if some would argue at a higher cost.



B.3.2 Army Total Acquisition Workforce: Composition (1992-2010)

Senior leaders attempting to use workforce counts as a proxy for acquisition capability could be misled by trends in any of the official counts in current use. Multiple efforts are currently underway to improve the accuracy of acquisition workforce counts at both OSD (DAWIA category competency assessments) and in the Army (e.g. FY13 Command Plan Guidance, continuous U.S. Army Acquisition Support Center refinements), with focuses ranging from systems engineers to contractors. All of these efforts have added value, but the lack of comparable historical data will leave supply and demand trend analysis uncertain in the short term. The accuracy of workforce reporting by responsible commands will remain a source of concern until the impact of new policies can be evaluated.

Unfortunately this leaves the Army in the position of having to triangulate workforce trends using several different methods. Current efforts to improve the DAWIA count should be continued. Acquisition organization workforce counts should also be maintained and accompany DAWIA workforce trends.

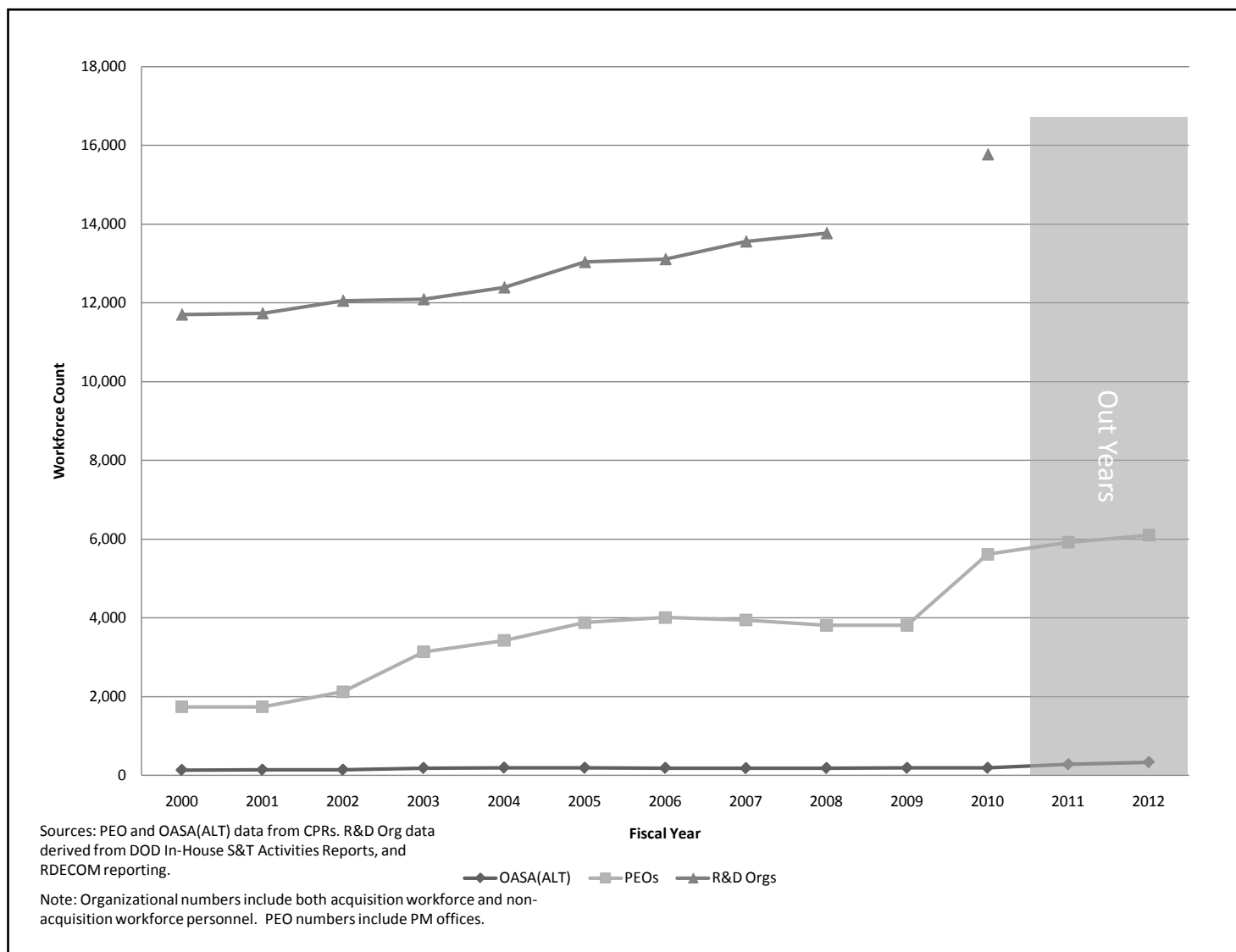


B.3.3 Army Military Acquisition Workforce: Composition (1992 – 2010)

Additionally, the Army might systematically track what percent of relevant occupational series are constituted by the acquisition workforce (Ref 110). Rapid changes in that value that are unaccompanied by changes in the total workforce count for the given occupational series should be seen as a signal that associated changes in the total size of the acquisition workforce do not reflect changes in underlying capability.

Though individually administrative decisions over the coding of acquisition positions and personnel may be valid, in their totality they've had the effect of undermining the Army's ability to develop insights into its own acquisition workforce.

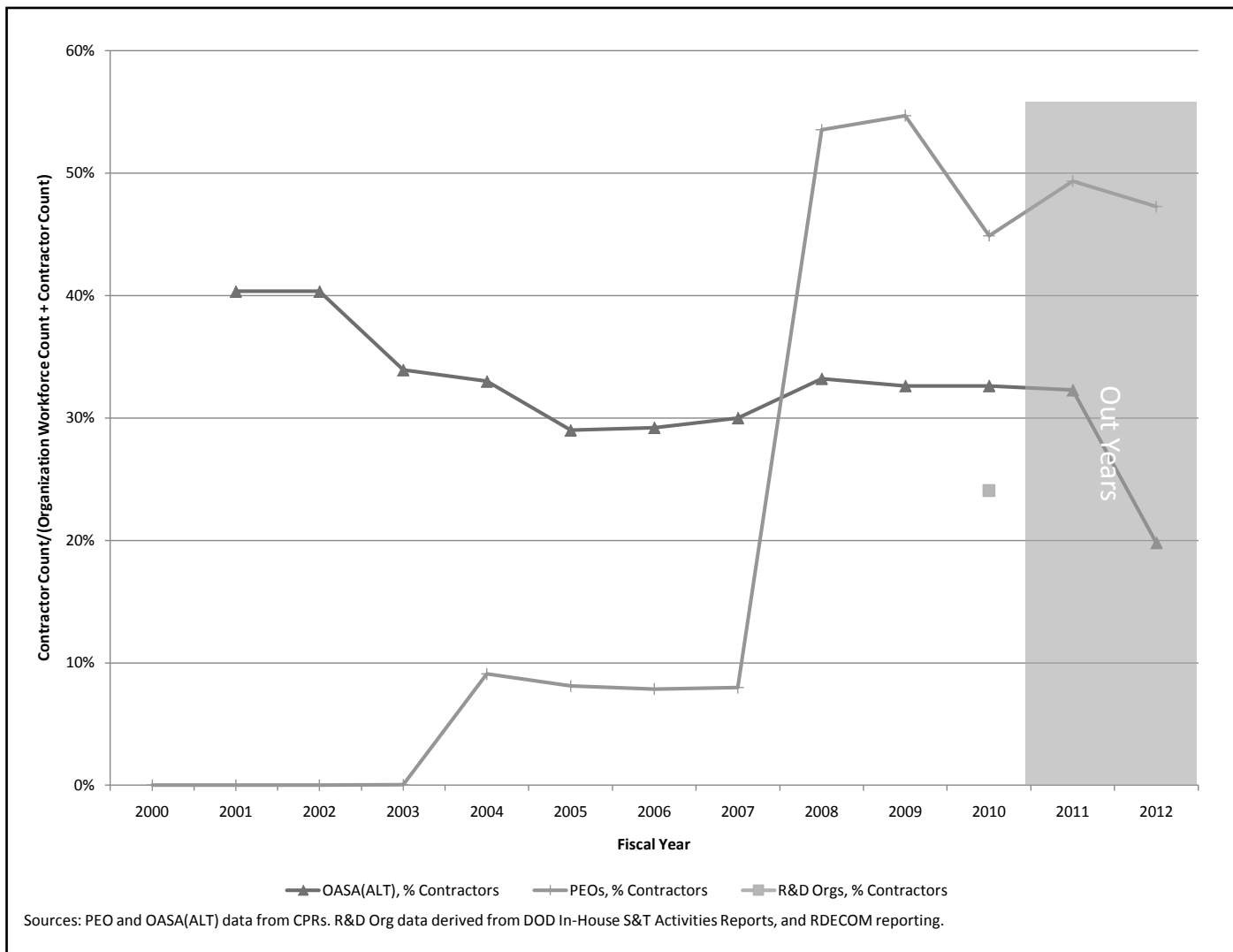
To cope with the coding instability problems and draw supportable findings and recommendations the panel turned toward a modified organizational workforce count to capture key trends (see Figures B.3.4 – 6). Data sources and procedures used to build this modified organizational workforce count are discussed below (see Figure B.3.4).



B.3.4 PEOs, R&D Orgs, and OASA(ALT): Organizational Workforce Count

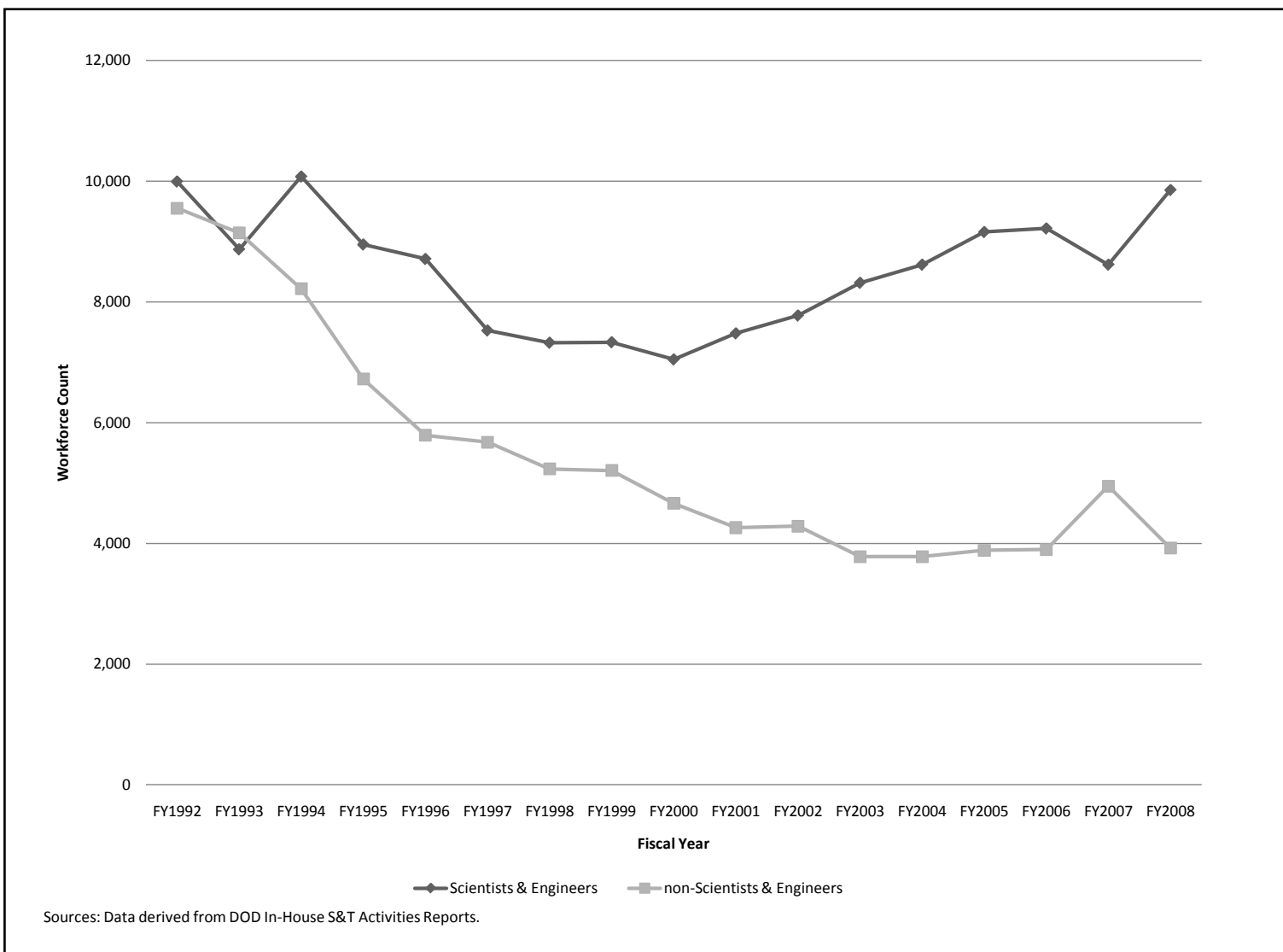
Chart B.3.4 aggregates data from three different sources. PEO and OASA(ALT) workforce numbers are based on data in their respective Capability Portfolio Reviews, developed to brief the VCSA. The R&D Organization workforce count (also see B.3.6) is based on the Department of Defense In-House S&T Activities Management Analysis Reports, built annually by the DDR&E. The R&D Organization data is supplemented by FY10 personnel reports from RDECOM. The panel excluded Test & Evaluation and medical organizations from this data set to focus on the Army's R&D human capital.

Figure B.3.4 shows clear and steady personnel growth in both PEOs and R&D organizations since 2000.



B.3.5 Contractors' Share of Total Army Acquisition Organization Workforce

The instability in contractor data highlighted in Figure B.3.5 indicates the continued uncertainty the Army suffers from regarding the role of contractors Army acquisition. Most troubling of all is the level of PEO dependence on contractors.



B.3.6 Army R&D Organizational Workforce Counts: S&E vs. non-S&E

B.4 STATUTORY DOCUMENT REQUIREMENTS

Statutory Document Requirements	MDD	MS A	MS B	P-CDR A	MS C	FRP DR	Parent Doc
Acquisition Program Baseline (APB)			X		X	X	
Alternate Live Fire T&E Plan			X				
Analysis of Alternatives (AoA)		X	X		X	X	
Benefit Analysis and Determination			X		X		AS
Beyond LRIP Report						X	
CIO Confirmation of CCA Compliance		X	X		X	X	
Clinger-Cohen Act (CCA) Compliance		X	X		X	X	
Competition Analysis			X		X		AS
Consideration of Technology Issues		X	X		X		
Cooperative Opportunities		X	X		X		AS, TDS
Core Logistics/Source of Repair Analysis			X		X		AS
Data Management Strategy		X	X		X	X	AS, TDS
Economic Analysis (EA)		X	X			X	
Independent Cost Estimates (ICE)		X	X		X	X	
Industrial Base Capabilities			X		X		AS
Initial Operational Test and Evaluation Completed						X	
Live Fire T&E Report						X	
Live Fire T&E Waiver			X				
LRIP Quantities			X				
Manpower Estimate			X		X	X	
Market Research		X	X				
Milestone Decision Authority (MDA) Certification		X	X		X		
Military Equipment Valuation					X	X	AS
Post Implementation Review						X	
Program Environment, Safety, and Occup. Health Evaluation (PESHE)			X		X	X	
Replaced System Sustainment Plan			X				
Selected Acquisition Report (SAR)			X				
Technology Development Strategy (TDS)		X					

Document requirements are used to reduce risk in certain functional areas by ensuring centralized oversight and quality control. While this results in risk reduction in specific functional areas, it may indirectly increase overall program cost, performance and schedule risk in two ways. First, functional requirements increase program risk by distracting the finite program leadership resources from their focus on Army leadership's critical priorities for specific programs (as embodied in the program baseline). Second, functional requirements increase program risk by fragmenting authority over the program, while leaving accountability concentrated in the hands of relatively junior PMs.

The Army needs to ensure the alignment of document depth with program scope and risk. For statutory document requirements some dialogue with Congress will be necessary to

ensure that document efficiencies do not break with the Congressional intent embodied in law.

For example, many of the documents produced to meet Nunn-McCurdy certification requirements could be de-scoped when the unit-cost breach is clearly driven by dramatic quantity reductions rather than management or development challenges. The Department could then halve the number of IPTs it stands up to deal with a Nunn-McCurdy breach, standing up only the “Cost” and “Alternatives” IPTs. The national security portion of the certification could be based on the Army’s annual Capability Portfolio Review, and the program management portion by a memorandum from the Army Acquisition Executive to the USD(AT&L).

The Statutory Document Requirements slide can almost be read as a roster of previous acquisition reform efforts: “fly before you buy,” independent cost estimates, competition, COTS, Nunn-McCurdy, etc. Regulatory Document Requirements tend to be more closely aligned with the nuts and bolts of how programs are managed, but can be used by unaccountable stakeholders to create friction and delay program development. Addressing both sets of requirements consumes considerable amounts of time, and program management attention.

The Document Requirements tables list document titles required either by statute or regulations. Each column to the right of the document title column represents an acquisition milestone or decision point where an iteration of the document is required.

MDD – Materiel Development Decision

MS A – Milestone A

MS B – Milestone B

P-CDR A – Post Critical Design Review Assessment

MS C – Milestone C

FRP DR – Full-Rate Production Decision Review

Some of the documents listed are actually imbedded in other documents, here referred to as a “parent document.” Parent documents with “sum” next to them in parentheses contain only a summary of the listed document.

AS – Acquisition Strategy

TDS – Technology Development Strategy

ISP – Information Support Plan

B.5 REGULATORY DOCUMENT REQUIREMENTS

Regulatory Document Requirements	MDD	MS A	MS B	P-CDR A	MS C	FRP DR	Parent Doc
Acquisition Decision Memorandum (ADM)	X	X	X	X	X	X	
Acquisition Information Assurance Strategy		X	X		X	X	
Acquisition Strategy			X		X	X	AS
Affordability Assessment			X		X		
AoA Study Guidance	X						
Capability Development Document (CDD)			X				
Capability Production Document (CPD)					X		
Component Cost Estimate		X	X			X	
Component Cost Position (CCP)		X	X		X	X	
Corrosion Prevention Control Plan			X		X		AS
Cost Analysis Requirements Description (CARD)		X	X		X	X	
Exit Criteria		X	X		X	X	
Independent Technology Readiness Assessment			X		X		
Information Support Plan (ISP)			X	X	X		ISP
Initial Capabilities Document (ICD)	X	X	X		X		
Item Unique Identification (IUID) Plan		X	X		X		
Joint Interoperability Test Certification						X	
Life-Cycle Signature Support Plan		X			X		
Life-Cycle Sustainment Plan (LCSP)			X		X	X	AS
MDA assessment of CBRN survivability			X		X		
Net-Centric Data Strategy		X	X		X		ISP, TDS (sum)
Operational Test Agency Report of OT&E Results			X		X	X	
Post-Critical Design Review (CDR) Report				X			
Preliminary Design Review (PDR) Report			X				
Program Protection Plan (PPP)		X	X		X		AS (sum)
Spectrum Supportability Determination			X		X		
System Threat Assessment (STA)			X		X		
System Threat Assessment Report (STAR)			X		X		
Systems Engineering Plan (SEP)		X	X		X		
Technology Readiness Assessment (TRA)			X		X		
Test and Evaluation Master Plan (TEMP)			X		X	X	
Test and Evaluation Strategy (TES)		X					

ACRONYMS

Acronym	Full Name
AAC	Army Acquisition Corps
AAE	Army Acquisition Executive
AAH	Advanced Attack Helicopter
AAR	After Action Review
ACAT	Acquisition Category
ACC	Army Contracting Command
ACTD	Advanced Concept Technology Demonstration
ACTDP	Advanced Concept Technology Demonstration Program
ADM	Acquisition Decision Memorandum
AGS	Armored Gun System
AMC	Army Materiel Command
AMRDEC	Aviation and Missile Research, Development and Engineering Center
AMSAA	Army Materiel Systems Analysis Activity
ANVIS	Aviator's Night Vision Imaging System
AO	Action Officer
AoA	Analysis of Alternatives
APB	Acquisition Program Baseline
AR	Army Regulation
ARCIC	Army Capabilities Integration Center
ARFORGEN	Army Force Generation
ARH	Armed Reconnaissance Helicopter
ARL	Army Research Laboratory
ARO	Army Research Office
AROC	Army Requirements Oversight Council
ARSTAFF	Army Staff
AS	Acquisition Strategy
ASA(ALT)	Assistant Secretary of the Army (Acquisition, Logistics, and Technology)
ASARC	Army Systems Acquisition Review Council
ASC	Army Sustainment Command
ASTAG	Army Science and Technology Advisory Group
ASTWG	Army Science and Technology Working Group
ATEC	Army Test and Evaluation Command
ATIRCM	Advanced Threat Infrared Countermeasures
ATP	Acceptance Test Procedure
AUSA	Association of the United States Army
AWC	Army War College
B&P	Bid and Proposal

BENS	Business Executives for National Security
BOIP	Basis of Issue Plan
BOS	Battlefield Operating System
C3	Command, Control and Communications
C3T	Command, Control and Communications - Tactical
CAA	Center for Army Analysis
CARD	Capabilities Assessment and RAM Division
CBA	Capabilities Based Assessment
CCB	Configuration Control Board
CBO	Congressional Budget Office
CBRN	Chemical, Biological, Radioactive, Nuclear
CCA	Clinger-Cohen Act
CCB	Configuration Control Board
CDD	Capability Development Document
CDID	Capabilities Development and Integration Directorate
CDR	Critical Design Review
CECOM	Communications and Electronics Command
CEO	Chief Executive Officer
CERDEC	Communications Electronics Research, Development and Engineering Center
CG	Commanding General
CGSC	Command and General Staff College
CINC	Commander in Chief
CIO	Chief Information Officer
CMH	Center for Military History
CMO	Chief Management Officer
CNA	Center for Naval Analysis
CoE	Center of Excellence
COTR	Contracting Officer's Technical Representative
CPD	Capability Production Document
CPIF	Cost-Plus-Incentive Fee
CPOF	Command Post of the Future
CPR	Capability Portfolio Review
C-RAM	Counter Rocket, Artillery and Mortar
CS/CSS	Combat Support/Combat Service Support
CSA	Chief of Staff, Army
CSB	Configuration Steering Board
DA	Department of the Army
DAC	Department of the Army Civilians
DAE	Defense Acquisition Executive
DAPA	Defense Acquisition Performance Assessment
DARPA	Defense Advanced Research Projects Agency

DAS	Directorate for Advanced Systems
DASA	Deputy Assistant Secretary of the Army
DASA(CE)	Deputy Assistant Secretary of the Army (Cost and Economics)
DASC	Department of the Army Systems Coordinator
DAU	Defense Acquisition University
DCS	Deputy Chief of Staff
DCSRDA	Deputy Chief of Staff for Research, Development and Acquisition
DDR&E	Director, Defense Research and Engineering
DLA	Defense Logistics Agency
DMRR	Defense Manpower Requirements Report
DoD	Department of Defense
DOT&E	Director, Operational Test and Evaluation
DOTMLPF	Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities
DSB	Defense Science Board
DT&E	Development Testing and Evaluation
DUSA(OR)	Deputy Undersecretary of the Army (Operations Research)
DUSD	Deputy Undersecretary of Defense
ECP	Engineering Change Proposal
EIS	Enterprise Information System
FA	Functional Area
FBCB2	Force XXI Battle Command Brigade and Below
FCS	Future Combat Systems
FFRDC	Federally Funded Research and Development Center
FLIR	Forward-Looking Infrared
FM	Field Manual
FOA	Field Operating Agency
FP	Fixed Price
FPIF	Fixed-Price-Incentive Fee
FRP	Full Rate Production
GCS	Ground Combat Systems
GCV	Ground Combat Vehicle
GMLRS	Guided Multiple Launch Rocket System
GO	General Officer
GSS	Ground Soldier System
HASC	House Armed Services Committee
HCA	Head Contracting Authority
HIMARS	High Mobility Artillery Rocket System
HMMWV	High-Mobility Multipurpose Wheeled Vehicle
HQ	Headquarters
HQDA	Headquarters, Department of the Army
HRED	Human Resources Engineering Directorate

HSCB	Human Social Culture Behavior
HTI	Horizontal Technology Integration
IBA	Interceptor Body Armor
ICD	Initial Capabilities Document
ICDT	Integrated Capabilities Development Team
ICE	Independent Cost Estimate
IEW&S	Intelligence, Electronics Warfare and Sensors
IEW	Intelligence and Electronic Warfare
IOC	Initial Operational Capability
IMMC	Integrated Materiel Management Center
IPPD	Integrated Process and Product Development
IPT	Integrated Product Team
IRAD	Independent Research and Development
IRL	Integration Readiness Level
ISP	Information Support Plan
ISR	Intelligence, Surveillance and Reconnaissance
ITAR	International Traffic in Arms Regulation
IUID	Item Unique Identification Plan
IW	Irregular Warfare
J&A	Justifications and Approvals
JAGM	Joint Air-Ground Missile
JCB	Joint Capabilities Board
JCID	Joint Capability Integration Development
JCS	Joint Chiefs of Staff
JCTD	Joint Capability Technology Demonstration
JLENS	Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System
JNN	Joint Network Node
JROC	Joint Requirements Oversight Council
JTRS	Joint Tactical Radio System
JUON	Joint Urgent Operational Need
KPP	Key Performance Parameter
KSA	Key System Attribute
LCC	Life Cycle Cost
LCMC	Life Cycle Management Command
LCSP	Life Cycle Sustainment Plan
LLDR	Lightweight Laser Designator Rangefinder
LOGSA	Logistics Support Activity
LOSAT	Line of Sight Antitank
LRIP	Low Rate Initial Production
LTG	Lieutenant General
LUH	Light Utility Helicopter

MANPRINT	Manpower Personnel Integration
MCO	Major Combat Operations
MDA	Milestone Decision Authority
MDAP	Major Defense Acquisition Program
MDD	Materiel Development Decision
MDEP	Management Decision Package
MG	Major General
MGV	Manned Ground Vehicle
MRAP	Mine Resistant Ambush Protected vehicle
MRL	Manufacturing Readiness Level
MS	Milestone
MSE	Mobile Subscriber Equipment
MYP	Multi-Year Production
NASA	National Aeronautics and Space Agency
NDI	Non-Developmental Item
NLOS-C	Non-Line-of-Sight Cannon
N/A	Not Applicable
NSRDEC	Natick Soldier Research, Development and Engineering Center
OCO	Overseas Contingency Operations
OEF	Operation Enduring Freedom
OICW	Objective Individual Combat Weapon
OIF	Operation Iraqi Freedom
OMA	Operations and Maintenance, Army
ONS	Operational Need Statement
OPTEC	Operational Test and Evaluation Command
ORSA	Operations Research/Systems Analysts
OSD	Office of the Secretary of Defense
O&S	Operations and Support
OT&E	Operational Test and Evaluation
OUSDP(P&R)	Office of the Undersecretary of Defense for Personnel and Readiness
P/RCMRL	Precision/Rapid Counter-Multiple Rocket Launcher
PAE	Program Analysis and Evaluation
PDR	Preliminary Design Review
PEG	Program Evaluation Group
PEO	Program Executive Office/Officer
PGK	Precision Guidance Kit
PGMM	Precision Guided Mortar Munition
PM	Program Manager, Project Manager, or Product Manager
POM	Program Objective Memorandum
PPBC	Planning Program Budget Committee
PPBE	Planning, Programming, Budgeting and Evaluation
PPP	Program Protection Plan

QDR	Quadrennial Defense Review
RAM	Reliability, Availability and Maintainability
RDA	Research, Development and Acquisition
RDEC	Research, Development and Engineering Center
RDECOM	Research, Development and Engineering Command
RDT&E	Research, Development, Technology and Engineering
Ret	Retired
REF	Rapid Equipping Force
RFI	Rapid Fielding Initiative
RFP	Request for Proposals
ROI	Return on Investment
S&T	Science and Technology
SAE	Service Acquisition Executive
SAR	Selected Acquisition Report
SEP	Systems Engineering Plan
SEP	System Enhancement Plan
SES	Senior Executive Service
SLAD	Survivability/Lethality Directorate
SLAMRAAM	Surface Launched Advanced Medium Range Air to Air Missile
SOA	Special Operations Aircraft
SSAC	Source Selection Advisory Committee
SSEB	Source Selection Evaluation Boards
SSO	System Synchronization Officer
STA	System Threat Assessment
STAR	System Threat Assessment Report
STF	Special Task Force
T&E	Testing and Evaluation
TARDEC	Tank Automotive Research, Development and Engineering Center
TCM	TRADOC Capability Manager
TDP	Technical Data Package
TDS	Technology Development Strategy
TEMP	Test and Evaluation Master Plan
TES	Test and Evaluation Strategy
TF	Task Force
THAAD	Terminal High Altitude Air Defense
TOA	Total Obligational Authority
ToD	Trade-off Determination
ToR	Terms of Reference
TRA	Technology Readiness Assessment
TRAC	TRADOC Analysis Center
TRADOC	U.S. Army Training and Doctrine Command
TRL	Technology Readiness Level

TTHS	Transients, Trainees, Holdees, and Students
UARC	University-Affiliated Research Center
USD	Undersecretary of Defense
USD(AT&L)	Undersecretary of Defense for Acquisition, Technology and Logistics
USAF	United States Air Force
UTTAS	Utility Tactical Transport Aircraft System
UON	Urgent Operational Need
VCSA	Vice Chief of Staff, Army
WARBUCS	Web Army RDA Budget Update Computer System
WIN-T	Warfighter Information Network – Tactical

REFERENCES

- 1 *2010 Army Modernization Strategy*, Washington, D.C.: Deputy Chief of Staff, G-8, Department of the Army, 23 April 2010.
- 2 Acquisition Advisory Panel, *Report of the Acquisition Advisory Panel to the Office of Federal Procurement Policy and the United States Congress*, Washington, D.C., January 2007. As of August 18, 2010:
https://www.acquisition.gov/comp/aap/24102_GSA.pdf.
- 3 Advisory Group on Electron Devices, *Critical Assessment of Technologies*, Department of Defense, 2002.
- 4 Aerospace Industries Association, *U.S. Defense Acquisition: An Agenda for Positive Reform*, November 2008. As of August 28, 2010: http://www.aia-aerospace.org/assets/report_acquisition-reform-09.pdf.
- 5 "AGS Killed As Army Budget Rises," *Defense Daily*, March 4, 1996.
- 6 Ahearn, David L., Jr., *DOD Materiel Acquisition: High Level Problems Require High Level Cures*, Carlisle Barracks, Pa.: U.S. Army War College, April 15, 1991.
- 7 Anderson, Frank J., Jr., *System Planning, Research, Development and Engineering (SPRDE) Career Field Program Systems Engineer (PSE) Career Path Implementing Instructions*, memorandum, 1 October 2007.
- 8 Angelis, Diana, John Dillard, Raymond Franck, Francois Melese, Mary Maureen Brown, and Robert M. Flowe, *Exploring the Implications of Transaction Cost Economics on Joint and System-of-Systems Programs*, Monterey, Calif.: Naval Postgraduate School, August 19 2009.
- 9 Arena, Mark V. and John L. Birkler, *Determining When Competition is a Reasonable Strategy for the Production Phase of Defense Acquisition*, Santa Monica, Calif: RAND Corporation 2009.
- 10 *ARL Demonstration Project Implementation Plan*, 7 June 1998, amended 21 January 2000.
- 11 "Army Briefs Perry On Cancellation of AGS," *Defense Daily*, January 31, 1996.
- 12 "Army Directs Cuts, Adjustments, To FCS," *Defense Daily*, January 19, 2007.
- 13 "Army Kills MULE, Fire Scout," *Defense Daily*, January 14, 2010.
- 14 Army Materiel Systems Analysis Activity and TRADOC Analysis Center, "Analysis of Alternatives Review," briefing charts, 5 October 2010.
- 15 Army Materiel Systems Analysis Activity and TRADOC Analysis Center, "Irregular Warfare Analyses and Modeling Briefing to VCSA," briefing charts, 1 July 2010.
- 16 Army Materiel Systems Analysis Activity and TRADOC Analysis Center, "Irregular Warfare Analyses and Modeling Briefing to VCSA," briefing charts, 28 April 2010.

- 17 Army Materiel Systems Analysis Activity, "AMC Analysis Center Overview: Selected Slides from 2009-10 AMCAC Initiative," briefing charts, 19 October 2010.
- 18 Army Regulation 70-1, *Army Acquisition Policy*, Washington, D.C.: Department of the Army, 31 December 2003.
- 19 Army Regulation 71-9, *Warfighting Capabilities Determination*, Washington, D.C.: Department of the Army, 28 December 2009.
- 20 *Army Science and Technology Master Plan 2010*, Washington, D.C.: Office of the Deputy Assistant Secretary of the Army for Research and Technology, July 2010.
- 21 Army Science Board, *1993 Summer Study Final Report on Innovative Acquisition Strategies for the 90s*, Washington, D.C.: Department of the Army, July 1994.
- 22 "Army Terminates Comanche Helicopter Program," *Defense Daily*, February 24, 2004.
- 23 Asiedu, Y. and P. Gu, "Product Life Cycle Cost Analysis: State of the Art Review," *International Journal of Production Research*, Vol. 36, No. 4, 1998, pp. 883-908.
- 24 Assistant Secretary of the Army for Acquisition, Logistics and Technology, *Army Configuration Steering Boards (CSB)*, memorandum, 2 January 2008.
- 25 Assistant Secretary of the Army for Acquisition, Logistics and Technology, *Army Materiel Development Decision (MDD) Implementation*, Washington, D.C.: Department of the Army, 2 December 2009.
- 26 Assistant Secretary of the Army for Acquisition, Logistics and Technology, *Rapid Acquisition Case Studies*, briefing charts, November 2010.
- 27 Assistant Secretary of the Army for Acquisition, Logistics and Technology, *Workforce Composition CPR Session 1: ASA(ALT) Organizational Assessment*, briefing charts, 27 September 2010, FOUO.
- 28 Assistant Secretary of the Army for Financial Management and Comptroller, *Army Green Book*, February 2003. As of 22 January 2011:
<http://www.asafm.army.mil/offices/BU/BudgetMat.aspx?OfficeCode=1200>.
- 29 Assistant Secretary of the Navy for Research, Development and Acquisition, "Systems Command/Program Executive Office/Naval Warfare Center Business Model," memorandum, Washington, D.C., 18 January, 2008.
- 30 Association of the U.S. Army, *Reports from AUSA Fires Symposium*, July 22, 2010. As of August 28, 2010:
<http://www.ausa.org/news/2010/Pages/ReportsfromAUSAFiresSymposium2010.aspx>.
- 31 Association of the U.S. Army's Institute of Land Warfare, *Defense Report: Capability Portfolio Reviews*, Arlington, Va.: September 2010. As of December 2, 2010: <http://www.ausa.org/publications/ilw/Documents/DR%2010-3%20CPR%20v2%20web.pdf>
- 32 Axelband, Elliot and Amado Cordova, *RDECOM Business Plan for System of Systems Engineering*, Santa Monica, Calif.: RAND Corporation, unpublished

- research.
- 33 Bankston, Boyd, *Establishing A Holistic Defense Framework For Requirements and Acquisition Processes*, Carlisle Barracks, Pa.: U.S. Army War College, March 15, 2008.
- 34 Bankston, Boyd, *Establishing A Holistic Defense Framework For Requirements and Acquisition Processes*, Carlisle Barracks, Pa.: U.S. Army War College, March 15, 2008.
- 35 Bauman, Michael F., and W.Forrest Crain, "Analysis of Alternatives (AoA) Funding: A New Paradigm," briefing charts, TRAC and AMSAA, 5 October 2010.
- 36 Baumgardner, Neil, "Rumsfeld Holds Grizzly Funds, Army Seeks Reprogramming," *Defense Daily*, June 29, 2001.
- 37 Baumgardner, Neil, "United States, Britain Agree To Terminate Future Scout Cavalry System," *Defense Daily*, October 18, 2001.
- 38 Baumgardner, Neil, "Wolverine To Be Included In FY '02 Army Budget Request," *Defense Daily*, October 17, 2000.
- 39 Berteau, David J., Joachim Hofbauer, and Stephanie Sanok, *Implementation of the Weapon Systems Acquisition Reform Act of 2009*, Washington, D.C.: Center for Strategic and International Studies, May 26, 2010.
- 40 *Best Practices: How to Avoid Surprises in the World's Most Complicated Technical Process*, NAVSO P-6071, Department of the Navy, March 1986/
- 41 Blickstein, Irv and Charles P. Nemfakos, "Will the Twain Ever Meet? Military Run Requirements vs. Civilian Run Acquisition," briefing charts, RAND Corporation, 2010.
- 42 Blickstein, Irv and Charles P. Nemfakos, *Goldwater-Nichols Military Run versus Civilian Run Acquisition: Will the Twain Ever Meet in the DON?*, Santa Monica, Calif.: RAND Corporation, unpublished research.
- 43 Blue Ribbon Defense Panel, *Report to The President and the Secretary of Defense on the Department of Defense by the Blue Ribbon Defense Panel*, Department of Defense, July 1, 1970.
- 44 Bolten, John G., Robert S. Leonard, Mark V. Arena, Obaid Younossi, and Jerry M. Sollinger, *Sources of Weapon System Cost Growth: Analysis of 35 Major Defense Acquisition Programs*, Santa Monica, Calif.: RAND Corporation, 2008.
- 45 Business Executives for National Security, *Defense Acquisition Archives*. As of August 28, 2010:
<http://www.bens.org/library/Defense%20Acquisition%20Archives.pdf>
- 46 Butler, Amy, "Pentagon Plans to Shuffle More Than \$3 Billion In FY '04, Funding, Sources Vary," *Defense Daily*, July 6, 2004.
- 47 Carter, Ashton B., "Better Buying Power: Guidance for Obtaining Greater Efficiency and Productivity in Defense Spending," memorandum, Under Secretary of Defense for Acquisition, Technology and Logistics, 14 September 2010.

- 48 Carter, Ashton B., "Implementation Directive for Better Buying Power - Restore Affordability and Productivity in Defense Spending," memorandum for Secretaries of the Military Departments and Directors of Defense Agencies, Under Secretary of Defense for Acquisition, Technology and Logistics, 3 November 2010.
- 49 Carter, Ashton B., "Implementation Directive for Better Buying Power - Restore Affordability and Productivity in Defense Spending," memorandum, Under Secretary of Defense for Acquisition, Technology and Logistics, 14 September 2010.
- 50 Chadwick, Stephen Howard, *Defense Acquisition: Overview, Issues, and Options for Congress*, Washington, D.C.: Congressional Research Service, RL34026, June 20, 2007.
- 51 Chairman of the Joint Chiefs of Staff Manual 3170.01C, 1 May 2007.
- 52 Chairman of the Joint Chiefs of Staff Manual 3170.01C, *Operation of the Joint Capabilities Integration and Development System*, Washington, D.C.: Department of Defense, May 1, 2007.
- 53 Chait, Richard, John Lyons and Duncan Long, Critical Technology Events in the Development of the Abrams Tank: Project Hindsight Revisited, Washington, D.C.: Center for Technology and National Security Policy, December 2005.
- 54 Chait, Richard, John Lyons and Duncan Long, Critical Technology Events in the Development of the Apache Helicopter: Project Hindsight Revisited, Washington, D.C.: Center for Technology and National Security Policy, February 2006.
- 55 Chavis, George M., "Service Contracting," Office of the Assistant Secretary of the Army, Acquisition, Logistics and Technology, email to John R. Cason, 26 October 2010.
- 56 Christensen, David S., David A. Searle and Caisse Vickery, "The Impact of the Packard Commission's Recommendations on Reducing Cost Overruns on Defense Acquisition Contracts," *Acquisition Review Quarterly*, Summer 1999.
- 57 Code of Federal Regulations, Title 22, Chapter 1, Subchapter M, *International Traffic In Arms Regulations (ITAR)*.
- 58 Commission on Army Acquisition and Program Management in Expeditionary Operations, "Gansler Commission Report," *Urgent Reform Required: Army Expeditionary Contracting*, October 31, 2007. As of December 12, 2008: http://www.army.mil/docs/Gansler_Commission_Report_Final_071031.pdf
- 59 Committee on Pre-Milestone A Systems Engineering, *Pre-Milestone A Systems Engineering: A Retrospective Review and Benefits for Future Air Force Systems Acquisition*, Washington, D.C.: The National Academies Press, 2008.
- 60 Congressional Budget Office, *The Budget and Economic Outlook: An Update*, Washington, D.C.: Congress of the United States, Congressional Budget Office, August 2010. As of 7 December 2010: <http://www.cbo.gov/ftpdocs/117xx/doc11705/08-18-Update.pdf>
- 61 Crain, W.Forrest, "AMC Analysis Center," briefing charts, July 2009.

- 62 Crain, W.Forrest, "AMC Analysis Center: Concept Study Update," briefing charts, February 2010.
- 63 Decker, Gil et al, *Improving Army Basic Research - Report of an Expert Panel on the Future of Army Laboratories*, Santa Monica, Calif.: RAND Corporation, unpublished research.
- 64 Decker, Gil, George Singley, and David Mosher, "Improving Army Basic Research: Report of the RAND Panel on the Future of Army Laboratories," briefing charts given to Malcolm O'Neill, RAND Corporation, 22 October 2010.
- 65 "Defense Acquisition, No Wonder They Call It 'The Big Ugly,'" *National Defense*, August 12, 2010.
- 66 Defense Acquisition Performance Assessment Project, *Defense Acquisition Performance Assessment Report*, Department of Defense, January 2006.
- 67 Defense Acquisition Performance Assessment Project, *Executive Summary*, Department of Defense, December 2005.
- 68 Defense Acquisition University, *OSD Study of Program Manager Training and Experience (Volume One of Two)*, July 1, 2009.
- 69 Defense Acquisition University, "Program Team Accountability: An Introduction to USD(AT&L) Priorities," briefing charts, no date.
- 70 Defense Acquisition University, *Defense Acquisition Guidebook*, August 5, 2010. As of August 18, 2010: <https://dag.dau.mil/Pages/Default.aspx>.
- 71 Defense Acquisition University, *Defense Acquisition Structures and Capabilities Review*, Fort Belvoir, Va., June 2007.
- 72 Defense Manpower Data Center, data files on acquisition workforce, 2010.
- 73 Defense Science Board Task Force on Research and Development Management, *Final Report on Systems Acquisition*, Washington, D.C.: Office of the Director of Defense Research and Engineering, 31 July 1969.
- 74 Defense Science Board, *Creating a DOD Strategic Acquisition Platform*, Washington, D.C.: Office of the Undersecretary of Defense For Acquisition, Technology, And Logistics, April 2009.
- 75 Defense Science Board, *Department of Defense Policies and Procedures for the Acquisition of Information Technology*, Washington, D.C.: Office of the Undersecretary of Defense For Acquisition, Technology, And Logistics, March 2009.
- 76 Defense Science Board, *Fulfillment of Urgent Operational Needs*, Washington, D.C.: Office of the Undersecretary of Defense For Acquisition, Technology, And Logistics, July 2009.
- 77 Defense Science Board, *Transformation: A Progress Assessment (Volume I)*, Washington, D.C.: Office of the Undersecretary of Defense for Acquisition, Technology and Logistics, February 2006.
- 78 Defense-Industrial Initiatives Group, *Cost and Time Overruns for Major Defense Acquisition Programs*, Washington, D.C.: Center for Strategic & International

- Studies, April 2010.
- 79 Department of Defense Instruction Number 5000.02, *Operation of the Defense Acquisition System*, Washington, D.C.: Undersecretary of Defense for Acquisition, Technology and Logistics, December 8, 2008.
- 80 Department of Defense, *Investment Strategies for MDAPs: Report to Congress*, 2009.
- 81 Department of Defense, "Department of Defense In-House S&T Activities, FY ____ Management Analysis Report, U.S. DoD, 20____
- 82 Department of Defense, *Appendix 1 DOD Strategic Human Capital Plan Update The Defense Acquisition Workforce*, April 2010.
- 83 Department of Defense, *Defense Acquisition Transformation: Report to Congress*, July 2007.
- 84 Department of Defense, *Developmental Test and Evaluation and Systems Engineering FY 2009 Annual Report*, March 2010.
- 85 Department of Defense, *DoD Weapon System Acquisition Reform Product Support Assessment*, November 2009.
- 86 Department of Defense, *Joint Capability Area Management Plan*, January 27, 2010. As of December 2, 2010: <https://acc.dau.mil/adl/en-US/345993/file/48695/Joint%20Capability%20Area%20Management%20Plan%20-JCAMP%20Final%20-%2027%20Jan%202010.pdf>
- 87 Department of Defense, Quadrennial Defense Review Report, Washington, D.C., February 2006. As of 18 January 2011: www.defense.gov/qdr/report/Report20060203.pdf.
- 88 Department of Defense, Quadrennial Defense Review Report, Washington, D.C., February 2010. As of 17 January 2011: http://www.defense.gov/qdr/images/QDR_as_of_12Feb10_1000.pdf
- 89 Department of Defense, *Selected Acquisition Reports*. As of December 2, 2010: <http://www.acq.osd.mil/ara/am/sar/>.
- 90 Department of the Army Pamphlet 70-3, *Army Acquisition Procedures*, Washington, D.C.: Department of the Army, 28 January 2008.
- 91 Department of the Army, General Order No. 3, Par 3b "DUSA(OR) Responsibilities," 9 July 2002.
- 92 *DoD Reprogramming and Transfer Actions*, Comptroller, Department of Defense. As of 19 January 2011: <http://comptroller.defense.gov/execution/reprogramming/>.
- 93 Drezner, Jeffrey A. and Megan McKernan, *Establishing a Measurement System to Inform DoD Acquisition Process Improvement*, Santa Monica, Calif: RAND Corporation, unpublished research.
- 94 Drezner, Jeffrey A. and Robert S. Leonard, *Comparing ACAT 1D and 1C Programs*, Santa Monica, Calif: RAND Corporation, unpublished research.
- 95 Drezner, Jeffrey A., Irv Blickstein, Raj Raman, Megan McKernan, Monica Hertzman, Melissa A. Bradley, Dikla Gavrieli, and Brent Eastwood, *Measuring the*

- Statutory and Regulatory Constraints on Department of Defense Acquisition: An Empirical Analysis*, Santa Monica, Calif.: RAND Corporation, 2007.
- 96 England, Gordon, testimony delivered before the House Armed Service Committee Panel on Acquisition Reform, June 3, 2009. As of August 18, 2010: http://armedservices.house.gov/pdfs/DAR060309/England_060309.pdf.
- 97 Farrell Jr., Lawrence, et al., *CNA Independent Assessment: Air Force Acquisition*, Washington, D.C.: Center for Naval Analyses, February 2009.
- 98 Field Manual 3-0, *Operations*, Washington, D.C.: Department of the Army, February 2008. As of December 2, 2010: http://armypubs.army.mil/doctrine/Active_FM.html.
- 99 Field Manual 41-10, *Civil Affairs Operations*, Washington, D.C.: Department of the Army, January 11, 1993.
- 100 Finley, James I., testimony delivered at the House Committee on Oversight and Government Reform, April 29, 2008.
- 101 Flail, Keith, "Apache Block III Cost Differences: New Start Approach vs ECP Approach," briefing charts, Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology, 2 October 2006.
- 102 Foote, Sheila, "Faced With Budget Shortfall, Army Eyes Killing Tanks, Blimp," *Defense Daily*, December 18, 1996.
- 103 Forster, William H., "Second Generation Common Module FLIR Special Task Force," memorandum, 2 February 1993.
- 104 Fox, J. Ronald, *Consolidated List of Sources on Defense Acquisition, 1945-2003*, *Defense History Acquisition Project*, U.S. Army Center of Military History. As of 19 January 2011: <http://www.history.army.mil/acquisition/research/section3.html>.
- 105 Fox, J. Ronald, *Department of Defense Acquisition Reform 1960-2009*, circulating draft.
- 106 French, Kristin K., *The Army Field Support Brigade: A Solution to Integrating Acquisition, Logistics and Technology*, Carlisle Barracks, Pa.: U.S. Army War College, March 15, 2006.
- 107 Gates, Robert M., "Acquisition and Requirements Reform," memorandum for Assistant to the President, National Security Affairs, May 2009.
- 108 Gates, Robert M., *Statement on Department Budget and Efficiencies*, 6 January 2011. As of 7 January 2011: <http://www.defense.gov/speeches/speech.aspx?speechid=1527>.
- 109 Gates, Robert M., *Statement to the Senate Armed Services Committee*, 27 January 2009. As of 13 January 2010: armed-services.senate.gov/statemnt/2009/January/Gates%2001-27-09.pdf.
- 110 Gates, Susan M., *Shining a Spotlight on the Defense Acquisition Workforce - Again*, Santa Monica, Calif.: RAND Corporation, 2009.
- 111 Gates, Susan M., "Shining a Spotlight on the Defense Acquisition Workforce -

- Again," briefing charts, RAND Corporation, 5 August 2010.
- 112 H.R. 5013, *Implementing Management for Performance and Related Reforms to Obtain Value in Every Acquisition Act of 2010*, Washington, D.C.: GPO, April 29, 2010. As of August 18, 2010: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_bills&docid=f:h5013rfs.txt.pdf
- 113 Hale, Kimberly, "Media Explanations for Program Terminations," briefing charts for Army Acquisition Review 2010, RAND Corporation, August 2010.
- 114 Hale, Kimberly, "Terminated Programs," unpublished data set, RAND Corporation, August 12, 2010.
- 115 Hale, Kimberly, "Termination Justifications," briefing charts, RAND Corporation, August 12, 2010.
- 116 Headquarters Department of the Army G-3/5/7, *Capability Set Management: Concept of Operations*, June 28, 2010, FOUO.
- 117 Held, Bruce et al., *Proposed Missions and Organization of the U.S. Army Research, Development and Engineering Command*, Santa Monica, Calif.: RAND Corporation, 2005.
- 118 Hill, Clayton F., and Kathleen W. Gerstein, *U.S. Army Acquisition Workforce: Reflecting Modern Structural Changes*, Monterey, Calif.: Naval Postgraduate School, June 2009.
- 119 *Historical PEO Structure*, slide in untitled briefing charts, data derived from "AIM DB as of 9/20/2010," FOUO.
- 120 Hollister, Eric A., *A Shot in the Dark: The Futility of Long-Range Modernization Planning*, Arlington, VA: Institute of Land Warfare, Association of the U.S. Army, October 2010.
- 121 Holman, Barry W., *Defense Infrastructure: Challenges Facing DOD Implementing Reform Initiatives*, testimony delivered Before the Subcommittee on Military Installations and Facilities, Committee on National Security, House of Representatives, Washington, D.C., GAO/T-NSIAD-98-115, 18 March 1998.
- 122 House Armed Services Committee Panel on Defense Acquisition Reform, *Findings and Recommendations*, March 23, 2010. As of August 18, 2010: <http://armedservices.house.gov/pdfs/DARFINALREPORT/DARFINALREPORT032310.pdf>.
- 123 "House-Senate Authorization Panel Approves LOSAT Funding," *Defense Daily*, August 8, 1996.
- 124 *Integrated Defense Acquisition, Technology and Logistics Life Cycle Management System*, Version 5.4, Ft. Belvoir, VA: Defense Acquisition University, 15 June 2010.
- 125 "JCIDS Dashboard 5 Nov 10 - ACAT sort.xlsx," data file provided by ARCIC-Forward, November 2010.
- 126 "JCIDS Manual Enclosure B." As of 11 August 2010: https://www.intelink.gov/wiki/JCIDS_Manual_Enclosure_B.

- 127 Johnson, Arne A., and John J. Philistine, *A Comparative Analysis of the Resources Required for Test and Evaluation on Army-Led Weapon System Programs, Based Upon Program Size and Acquisition Management Complexity*, Monterey, Calif.: Naval Postgraduate School, December 2007.
- 128 Johnson, W.L., and R.E. Reel, *Maintainability/Reliability Impact on System Support Costs*, Seattle, Wash.: Boeing Aerospace Company, December 1973.
- 129 Kassing, David, R. William Thomas, Frank Camm, Carolyn Wong, *How Funding Instability Affects Army Programs*, Santa Monica, Calif.: RAND Corporation, 2007.
- 130 Keeler, Kristi L., *U.S. Army Acquisition - The Program Office Perspective*, Pittsburg, Pa.: Software Engineering Institute, October 2005.
- 131 Kendall, Frank, "Acquisition Documentation Streamlining Task Force," memorandum, Principle Deputy Undersecretary of Defense, 10 June 2010.
- 132 Kennedy, Tim, "Rapid Fielding Team Tasked to Transform Army Acquisition," *National Defense*, February 2004.
- 133 Kleyner, Andrew, and Peter Sandborn, "Minimizing life cycle cost by managing product reliability via validation plan and warranty return cost," *International Journal of Production Economics*, Vol. 111, Issue 2, April 2008, pp. 796-807.
- 134 Kozaryn, Linda D., "Pentagon Terminates Crusader Program," *Armed Forces Press Service*, May 8, 2002.
- 135 Krikorian, George K., "DOD's 'Cost Premium' 30 to 50 Percent," *The DISAM Journal*, Fall 1992, pp. 75-77.
- 136 Kristol, William, "The Defense Secretary We Have," *The Washington Post*, 15 December 2004. As of 17 January 2011: <http://www.washingtonpost.com/wp-dyn/articles/A132-2004Dec14.html>.
- 137 Kwak, Young Hoon, and Brian M. Smith, "Managing Risks in Mega Defense Acquisition Projects: Performance, Policy, and Opportunities," *International Journal of Project Management*, No. 27, 2009, pp.812-820.
- 138 Laird, Robin T., "Evolving U.S. Department of Defense (DoD) Unmanned Systems Research, Development, Test, Acquisition & Evaluation (RDTA&E)," *SPIE Proc. 7332 Unmanned Systems Technology XI, Defense Security Symposium*, Orlando, Fla.: April 13-17 2009.
- 139 Lardner, Helen M. *The Army's Quest for a New Ground Combat Vehicle*, Carlisle Barracks, Pa.: U.S. Army War College, March 25, 2010.
- 140 "Lawmakers Push For Army To Fund Wolverine," *Defense Daily*, October 12, 2000.
- 141 "Lawmakers Push Rumsfeld To Obligate Wolverine Funds," *Defense Daily*, May 22, 2001.
- 142 Lemnios, Zachary J., *Statement Before the U.S. House of Representatives Committee on Armed Services Subcommittee on Terrorism, Unconventional Threats and Capabilities*, 23 March 2010.
- 143 Lorell, Mark A., Julia F. Lowell, and Obaid Younossi, *Evolutionary Acquisition:*

- Implementation Challenges for Defense Space Programs*, Santa Monica, Calif.: RAND Corporation, 2006.
- 144 Loren, Jeff and G. Richard Freeman, "Air Force Concept Maturity Assessment," U.S. Air Force, NDIA Systems Engineering Division, 12th Annual Systems Engineering Conference, San Diego, CA, October 28, 2009.
- 145 Lovett Sr., Robert A., *Army Acquisition Program Management: Winning on the Present and Future Battlefields*, Carlisle Barracks, Pa.: U.S. Army War College, May 3, 2004.
- 146 Lyons, John and Richard Chait, Assessing the Health of Army Laboratories: Funding for Basic Research and Laboratory Capital Equipment, Washington, D.C.: Center for Technology and National Security Policy, September 2010.
- 147 Lyons, John, Duncan Long, and Richard Chait, Critical Technology Events in the Development of the Stinger and Javelin Missiles: Project Hindsight Revisited, Washington, D.C.: Center for Technology and National Security Policy, July 2006.
- 148 Lyons, John, Richard Chait, and Duncan Long, *Critical Technology Events in the Development of Selected Army Weapons Systems*, National Defense University, September 2006.
- 149 Lyons, John, Richard Chait, and Jordan Willcox, Improving the Interface Between Industry and Army Science and Technology: Some Thoughts on the Army's Independent Research and Development Program, Washington, D.C.: Center for Technology and National Security Policy, June 2009.
- 150 Malenic, Marina, "Amid FCS Overhaul, Millions Still Spent on Terminated Vehicle Effort," Gates Recommends," *Defense Daily*, June 16, 2009.
- 151 McHugh, John , "Terms of Reference (TOR) for Army Acquisition Review," memorandum, Department of the Army, May 4, 2010.
- 152 McHugh, John, "Strategic Document Staffing Procedures and Forum Administration," memorandum, Department of the Army, 9 November 2010.
- 153 McHugh, John, "The Secretary of the Army's Capability Portfolio Review Strategy," memorandum, Department of the Army, 22 February 2010.
- 154 McHugh, John, Chief Management Officer Responsibilities for Army Business Transformation, memorandum, Department of the Army, 29 October 2009.
- 155 McHugh, John, Generating Force Overhead Analysis - Short Term Task Force, memorandum, Department of the Army, 20 August 2010.
- 156 McHugh, John, *Statement by the Secretary of the Army John McHugh on Efficiencies*, U.S. Department of Defense News Release, 6 January 2011. As of 7 January 2011: <http://www.defense.gov/releases/release.aspx?releaseid=14182>.
- 157 Miller, Karen S., "FA 49 Authorizations Overtime," HQDA G-8, email to David M. Maddox, 1 November 2010.
- 158 Mittelstedt, Polly, "Army System Termination," memorandum to the House Armed

- Services Committee, November 2, 2005.
- 159 Moteff, John D., *The Department of Defense Science and Technology Program: An Analysis, FY1998-FY2007*, Washington, D.C.: Congressional Research Services, RL34666, September 12, 2008.
- 160 Motes, Gregory, *Looking Forward: People First*, Arlington, VA: Institute of Land Warfare, Association of the U.S. Army, September 2010.
- 161 Mullen, Richard, "Comanche A Justifiable Sacrifice, Senate Told," *Defense Today*, March 31, 2004.
- 162 Mullen, Richard, "JCM Moves Forward Despite Countdown Clock," *Defense Today*, September 7, 2005.
- 163 Mullins, Tom, R. Mark Brown, et al., *Paladin Integrated Management (PIM) Red Team Report Phase I*, Washington, D.C.: Assistant Secretary of the Army for Acquisition, Logistics and Technology, March 5, 2010, FOUO.
- 164 Murdock, Clark A., Michele A. Flournoy, Kurt M. Campbell, Pierre A. Chao, Julianne Smith, Anne A. Witkowsky, Christine E. Wormuth, *Beyond Goldwater-Nichols: U.S. Government and Defense Reform for a New Strategic Era*, Washington, D.C.: Center for Strategic and International Relations, 2005.
- 165 Nance, Scott, "'Back to the Drawing Board' Army Cuts Lockheed Martin Out of Troubled ACS," *Defense Today*, January 13, 2006.
- 166 National Defense Industry Association's Gulf Coast Chapter Systems Engineering Industry Panel, *Acquisition Excellence Through Effective Systems Engineering*, National Defense Industry Association, June 2010.
- 167 Office of the Assistant Secretary of the Air Force for Acquisition, *Acquisition Improvement Plan*, Washington, D.C.: Headquarters United States Air Force, May 4, 2009.
- 168 Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology, "Justifications and Approval (J&A) Process and Priority," information paper, 13 September 2010.
- 169 Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology, "Primer on the Processing of Justifications and Approvals (J&As)," information paper, 27 September 2010.
- 170 Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology, ASA(ALT): Design, Develop, Deliver, Dominate 2010, Washington, D.C.: Department of the Army, 1 October 2009.
- 171 Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology, *Strategic Plan 2004-2009*, Washington, D.C.: Department of the Army, September 2004.
- 172 Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology, WARBUCS data files, November 2010.
- 173 Office of the Deputy Assistant Secretary of the Army (Procurement), "Justification and Approval (J&A) Lean Six Sigma Project," briefing charts, 23 September 2010.

- 174 Office of the Inspector General, *Acquisition of the Advanced Antitank Weapon System-Medium*, Arlington, Va.: Department of Defense, Report Number 92-023, December 17, 1991.
- 175 Office of the Inspector General, *Acquisition of the Army Airborne Surveillance, Target Acquisition, and Minefield Detection System*, Arlington, Va.: Department of Defense, D2008-129, September 10, 2008.
- 176 Office of the Inspector General, *Acquisition of the Army Land Warrior System*, Arlington, Va.: Department of Defense, D2002-143, September 5, 2002.
- 177 Office of the Inspector General, *Army Acquisition Executive's Management Oversight and Procurement Authority for Acquisition Category I and II Programs*, Arlington, Va.: Department of Defense, D-2007-005, October 12, 2006.
- 178 Office of the Inspector General, *Implementation of the DoD Management Control Program for Army Category II and II Programs*, Arlington, Va.: Department of Defense, D-2004-047, January 23, 2004.
- 179 Office of the Secretary of Defense, *Selected Acquisition Report, Program: ACS*, Washington, D.C.: Office of the Secretary of Defense, September 30, 2004-September 30, 2005.
- 180 Office of the Secretary of Defense, *Selected Acquisition Report, Program: Apache (AH-64)*, Washington, D.C.: Office of the Secretary of Defense, September 31, 1973-September 30, 1992.
- 181 Office of the Secretary of Defense, *Selected Acquisition Report, Program: Apache Longbow (AH-64D)*, Washington, D.C.: Office of the Secretary of Defense, December 31, 1989-December 21, 2007.
- 182 Office of the Secretary of Defense, *Selected Acquisition Report, Program: Apache Longbow Block III*, Washington, D.C.: Office of the Secretary of Defense, September 30, 2006-December 31, 2009.
- 183 Office of the Secretary of Defense, *Selected Acquisition Report, Program: Armed Recon Helicopter*, Washington, D.C.: Office of the Secretary of Defense, September 30, 2005-September 30, 2007.
- 184 Office of the Secretary of Defense, *Selected Acquisition Report, Program: ASM*, Washington, D.C.: Office of the Secretary of Defense, June 30, 1990-December 31, 1991.
- 185 Office of the Secretary of Defense, *Selected Acquisition Report, Program: ATIRCM/CMWS*, Washington, D.C.: Office of the Secretary of Defense, December 31, 1995-December 31, 2007.
- 186 Office of the Secretary of Defense, *Selected Acquisition Report, Program: BFVS/MICV*, Washington, D.C.: Office of the Secretary of Defense, March 31, 1973-December 31, 2007.
- 187 Office of the Secretary of Defense, *Selected Acquisition Report, Program: Blackhawk (UH-60)*, Washington, D.C.: Office of the Secretary of Defense, December 31, 1971-December 31, 1989.

- 188 Office of the Secretary of Defense, *Selected Acquisition Report, Program: Comanche (RAH-66)*, Washington, D.C.: Office of the Secretary of Defense, December 31, 1985-December 31, 2003.
- 189 Office of the Secretary of Defense, *Selected Acquisition Report, Program: Crusader (AFAS/FARV)*, Washington, D.C.: Office of the Secretary of Defense, December 31, 1994-December 31, 2001.
- 190 Office of the Secretary of Defense, *Selected Acquisition Report, Program: ER-MP UAS*, Washington, D.C.: Office of the Secretary of Defense, December 31, 2009.
- 191 Office of the Secretary of Defense, *Selected Acquisition Report, Program: FAADS C2I*, Washington, D.C.: Office of the Secretary of Defense, September 30, 1984-December 31, 1998.
- 192 Office of the Secretary of Defense, *Selected Acquisition Report, Program: FAADS LOS-F-H*, Washington, D.C.: Office of the Secretary of Defense, December 31, 1986-December 31, 1991.
- 193 Office of the Secretary of Defense, *Selected Acquisition Report, Program: FBCB2*, Washington, D.C.: Office of the Secretary of Defense, December 31, 1999-December 31, 2007.
- 194 Office of the Secretary of Defense, *Selected Acquisition Report, Program: FCS*, Washington, D.C.: Office of the Secretary of Defense, June 30, 2003-December 31, 2006.
- 195 Office of the Secretary of Defense, *Selected Acquisition Report, Program: Javelin (AAWS-M)*, Washington, D.C.: Office of the Secretary of Defense, September 30, 1989-December 31, 2006.
- 196 Office of the Secretary of Defense, *Selected Acquisition Report, Program: JCM*, Washington, D.C.: Office of the Secretary of Defense, June 30, 2004-December 31, 2004.
- 197 Office of the Secretary of Defense, *Selected Acquisition Report, Program: JLENS*, Washington, D.C.: Office of the Secretary of Defense, September 30, 2005-December 31, 2007.
- 198 Office of the Secretary of Defense, *Selected Acquisition Report, Program: Land Warrior*, Washington, D.C.: Office of the Secretary of Defense, December 31, 2002-December 31, 2006.
- 199 Office of the Secretary of Defense, *Selected Acquisition Report, Program: M1/M1A1/M1A2 Abrams*, Washington, D.C.: Office of the Secretary of Defense, September 30, 1973-December 31, 2003.
- 200 Office of the Secretary of Defense, *Selected Acquisition Report, Program: MLRS TGW*, Washington, D.C.: Office of the Secretary of Defense, September 30, 1984-December 31, 1991.
- 201 Office of the Secretary of Defense, *Selected Acquisition Report, Program: MLRS Upgrade (GMLRS)*, Washington, D.C.: Office of the Secretary of Defense, December 31, 1997-December 31, 2007.

- 202 Office of the Secretary of Defense, *Selected Acquisition Report, Program: MLRS*, Washington, D.C.: Office of the Secretary of Defense, June 30, 1979-December 31, 1995.
- 203 Office of the Secretary of Defense, *Selected Acquisition Report, Program: MSE*, Washington, D.C.: Office of the Secretary of Defense, December 31, 1985-September 30, 1993.
- 204 Office of the Secretary of Defense, *Selected Acquisition Report, Program: Patriot PAC3 P3I*, Washington, D.C.: Office of the Secretary of Defense, December 31, 1993-December 31, 2007.
- 205 Office of the Secretary of Defense, *Selected Acquisition Report, Program: Patriot*, Washington, D.C.: Office of the Secretary of Defense, June 30, 1969-September 30, 1992.
- 206 Office of the Secretary of Defense, *Selected Acquisition Report, Program: SADARM*, Washington, D.C.: Office of the Secretary of Defense, December 31, 1987-December 31, 2001.
- 207 Office of the Secretary of Defense, *Selected Acquisition Report, Program: SINCGARS*, Washington, D.C.: Office of the Secretary of Defense, December 31, 1983-December 31, 1999.
- 208 Office of the Secretary of Defense, *Selected Acquisition Report, Program: Stinger RMP*, Washington, D.C.: Office of the Secretary of Defense, December 31, 1986-December 31, 1994.
- 209 Office of the Secretary of Defense, *Selected Acquisition Report, Program: Stryker/IAV*, Washington, D.C.: Office of the Secretary of Defense, December 31, 1999-December 31, 2007.
- 210 Office of the Secretary of Defense, *Selected Acquisition Report, Program: TACMS/BAT*, Washington, D.C.: Office of the Secretary of Defense, September 30, 1991-December 31, 2002.
- 211 Office of the Secretary of Defense, *Selected Acquisition Report, Program: WIN-T Increment 1 & 2*, Washington, D.C.: Office of the Secretary of Defense, September 30, 2007-December 31, 2007.
- 212 Office of the Secretary of Defense, *Selected Acquisition Report, Program: WIN-T*, Washington, D.C.: Office of the Secretary of Defense, September 30, 2003-December 31, 2006.
- 213 Office of the Undersecretary of Defense (Comptroller), *National Defense Budget Estimates for FY2011*, March 2010. As of 22 January:
<http://comptroller.defense.gov/Budget2011.html>.
- 214 Omlie, Austin R., Terry R. Council, *Requirements Assessment and Integration of the United States Army Reserve and the Army National Guard into the Army Acquisition Corps*, Carlisle Barracks, Pa.: U.S. Army War College, May 15, 1997.
- 215 "OSD, Army Consider ARH Alternatives," *Defense Daily*, October 8, 2008.
- 216 Owen, Tom, "Acquisition Changes - - and Challenge," briefing charts from speech

- delivered at the 7th Annual Acquisition Research Symposium, Seaside, Calif., May 13, 2010. As of August 17, 2010:
http://www.acquisitionresearch.net/cms/_files/FY2010/NPS-AM-10-117.pdf
- 217 Park, Kent W., *Assembly Line to Custom Design: Reforming the Officer Development System*, Arlington, VA: Institute of Land Warfare, Association of the U.S. Army, October 2010.
- 218 Parsons, Jeffrey P., *Statement Before the Commission on Wartime Contracting in Iraq and Afghanistan on The Contingency Acquisition Workforce: What is Needed and How Do We Get There?*, 16 September 2010.
- 219 PEO CS/CSS Managed Programs and Systems Directory, July 2010. As of 28 December 2010: <http://peocscss.tacom.army.mil/index.html>.
- 220 Peters, John et al, *Assessing the Army's Acquisition Workforce*, Santa Monica, Calif: RAND Corporation, unpublished research.
- 221 Pinson, Tracy, "Program Briefing for Mr. Gilbert Decker," briefing charts, Office of Small Business Programs, Office of the Secretary of the Army, 16 August 2010.
- 222 Porter, Gene, et al., *The Major Causes of Cost Growth in Defense Acquisition*, Alexandria, Va.: Institute for Defense Analyses, P-4531, December 2009.
- 223 President's Blue Ribbon Commission on Defense Management, *A Quest for Excellence: Final Report to the President*, June 1986.
- 224 Program Executive Office Soldier, *Center of our Strength: PEO Soldier Portfolio FY2011*, Washington, D.C.: Department of the Army, no date.
- 225 Public Law 109-63, *National Defense Authorization Act For Fiscal Year 2006*, Washington, D.C.: GPO, 2006. As of 18 January 2011:
www.dod.mil/dodgc/olc/docs/PL109-163.pdf.
- 226 Public Law 111-23, *Weapon System Acquisition Reform Act of 2009*, Washington, D.C.: Government Printing Office, May 22, 2009. As of December 2, 2010:
<http://www.ndia.org/Advocacy/PolicyPublicationsResources/Documents/WSARA-Public-Law-111-23.pdf>.
- 227 Public Law 111-84, *The National Defense Authorization Act for Fiscal Year 2010*, Washington, D.C.: GPO, 28 October 2009.
- 228 Public Law 99-423, Goldwater-Nichols Department of Defense Reorganization Act of 1986, Washington, D.C.: GPO, 1986. As of 17 January 2011:
<https://acquisition.navy.mil/.../Goldwater-Nichols+DoD+Reorganization+Act+of+1986.pdf>.
- 229 Punaro, Arnold, "Reducing Overhead and Improving Business Operations," briefing charts, Defense Business Board, July 22, 2010.
- 230 Punaro, Arnold, *Reducing Overhead and Improving DoD's Business Operations*, Defense Business Board, July 22, 2010.
- 231 Quadrennial Defense Review Independent Panel, *The QDR in Perspective: Meeting America's National Security Needs in the 21st Century*, Washington, D.C.: United States Institute of Peace, 2010. As of December 2, 2010:

- http://foreignpolicy.com/files/fp_uploaded_documents/100728_QDR%20Ind.%20Review%20Rept.%207.27.10.pdf
- 232 RAND Corporation, "Comparison of the Acquisition Workforce Across the Services," briefing charts, no date.
- 233 RAND Corporation, "Improving the Army's Acquisition Workforce," unpublished research, December 2007.
- 234 RAND Corporation, "Rapid Acquisition of Army C2 Systems: Executive Summary," briefing charts, September 2010.
- 235 RAND Corporation, "Statutory and Regulatory Constraints on DoD Acquisition," briefing charts, May 2006.
- 236 Rau, Charles A. and Peter J. Stammersky, *Management and Oversight of Services Acquisition within the United States Army*, Monterey, Calif.: Naval Postgraduate School, June 2009.
- 237 Reig, Raymond W., Charles K. Gailey III, William J. Swank, Paul A. Alfieri, and Mark L. Suycott, *Department of Defense Acquisition Management Metrics*, Fort Belvoir, Va.: Defense Systems Management College, October 1999.
- 238 Reno Study Team, *Reforming the Requirements and Resourcing Processes in Support of Army Institutional Adaptation*, draft report, FOUO.
- 239 Reynolds, Scott, "Let's Fix It," *Defense AT&L*, November-December 2009, pp.18-23.
- 240 Roberts, Joseph, "DASA-S Slides and Most Recent JAWs Chart," Office of the Under Secretary of the Army for Acquisition, Logistics and Technology, email to William H. Forster, 3 December 2010.
- 241 Roosevelt, Ann, "Army Proposes Recommendation To Cancel NLOS-LS," *Defense Daily*, April 26, 2010.
- 242 Roosevelt, Ann, "Congress Will Have The Last Word On Army Cannon," *Defense Daily*, June 25, 2009.
- 243 Roosevelt, Ann, "NLOS-LS Program Future Pending Army Decision," *Defense Daily*, April 13, 2010.
- 244 Roosevelt, Ann, "Restructure Army Future Combat System, Gates Recommends," *Defense Daily*, April 7, 2009.
- 245 "Rumsfeld Releases Wolverine Funding," *Defense Daily*, May 29, 2001.
- 246 "SAC Defense Panel Cuts Most BAT R&D Funding," *Defense Daily*, July 18, 2002.
- 247 Schwartz, Moshe, *Defense Acquisition: Overview, Issues, and Options for Congress*, Washington, D.C.: Congressional Research Service, RL34026, June 18, 2008.
- 248 Schwartz, Moshe, *Defense Acquisitions: How DOD Acquires Weapon Systems and Recent Efforts to Reform the Process*, Washington, D.C.: Congressional Research Service, RL34026, April 23, 2010.
- 249 Schwartz, Moshe, *The Nunn-McCurdy Act: Background, Analysis and Issues for*

- Congress*, Washington, D.C.: Congressional Research Service, 21 June 2010.
- 250 *Secretary of the Army-Designated Capability Portfolio Reviews (Expanded Army Requirements Oversight Council) Terms of Reference*, USA/VCSA Memorandum for Distribution, 22 Feb 2010.
- 251 "Senate, House Defense Appropriations Panels Clash on Troubled Aircraft Effort," *Defense Daily*, September 16, 2008.
- 252 "Senator Questions Heavy Assault Bridge Termination," *Defense Daily*, October 12, 2000.
- 253 Shachtman, Noah, "Pentagon's Craziest PowerPoint Slide Revealed," *Wired.com Danger Room*, 13 September 2010. As of 12 November 2010:
<http://www.wired.com/dangerroom/2010/09/revealed-pentagons-craziest-powerpoint-slide-ever/>.
- 254 Sharp, Walter L., *Analysis Requirements to Support the New Acquisition System in the Department of Defense*, Carlisle Barracks, Pa.: U.S. Army War College, April 15, 1993.
- 255 Singley III, George T., *Army Science & Technology Contributions to Army Aviation*, briefing charts delivered to American Helicopter Society, Hampton Roads Chapter, June 9, 2010.
- 256 Singley III, George T., *Technology Area Review and Assessment*, briefing charts, 1998.
- 257 Smith, Ricky E., "Capabilities Development manning History," ARCIC-Forward, email to David M. Maddox, 1 November 2010.
- 258 "Space Acquisition," *High Frontier*, Air Force Space Command, Vol. 6 No. 1, November 2009.
- 259 Starrett, Elizabeth, "Software Acquisition in the Army," May 2007, Crosstalk: The Journal of Defense Software Engineering, pp. 4-8.
- 260 Stuckey, Norman, "Stryker Info," Office of the Assistant Secretary of the Army, Acquisition, Logistics and Technology, email to John R. Cason, 19 January 2011.
- 261 Sullivan, Michael J., "An Assessment of Acquisition Outcomes and Potential Impact of Legislative and Policy Changes, Washington," briefing charts from speech delivered at the 6th Annual Acquisition Research Symposium, Naval Post Graduate School, Monterey, Calif., May 12, 2010.
- 262 Sullivan, Michael J., "Defense Acquisitions: Observations on Weapon Program Performance and Acquisition Reforms," testimony delivered before the Subcommittee on National Security and Foreign Affairs, Committee on Oversight and Government Reform, House of Representatives, Washington, D.C., GAO-10-706T, May 19, 2010.
- 263 Sutterfield, J. Scott, Shawnta S. Friday-Stroud, and Sheryl L. Shivers-Blackwell, "A Case Study of Project and Stakeholder Management Failures: Lessons Learned," *Project Management Journal*, Vol. 37, No. 5, December 2006, pp. 26-35.
- 264 Task Force on Defense Acquisition Law and Oversight, *Getting to Best: Reforming*

- the Defense Acquisition Enterprise*, Washington, D.C.: Business Executives for National Security, July 2009.
- 265 *Technology Maturity and Technology Readiness Assessments*, Office of the Undersecretary of Defense for Acquisition, Technology and Logistics. As of 17 January 2011: <http://www.acq.osd.mil/jctd/TRL.html>.
- 266 The White House, Office of Press Secretary, "Fact Sheet on the President's Export Control Reform Initiative", 20 April 2010
- 267 The White House, Office of the President, *The National Security Strategy of the United States of America*, May 2010.
- 268 Thompson, Loren, *Reversing Industrial Decline: A Role for the Defense Budget*, Lexington Institute, August 2009.
- 269 Todaro, John B., *S&T Affordability Task Force Update*, briefing charts, Office of the Director, Defense Research & Engineering (Laboratory Management/Technology Transition), October 1, 1998.
- 270 TRADOC Reg 10-5-1, *Organization and Functions: Headquarters, U.S. Army Training and Doctrine Command*, Fort Monroe, Va.: U.S. Army TRADOC, July 20, 2010. As of December 2, 2010: <http://www.tradoc.army.mil/tpubs/regndx.htm>
- 271 TRADOC Reg 10-5-1, *Organization and Functions: Headquarters, U.S. Army Training and Doctrine Command*, Fort Monroe, Va.: U.S. Army TRADOC, July 20, 2010. As of December 2, 2010: <http://www.tradoc.army.mil/tpubs/regndx.htm>
- 272 Treddenick, John M., "Cost-Effectiveness in Defense Expenditures," *The International Journal of Management Science*, Vol. 7, No. 5, pp. 439 to 467.
- 273 U.S. Army Audit Agency, "GAO Special Interest Projects (May 2010)," memorandum, Alexandria, VA., May 31, 2010.
- 274 U.S. Army Audit Agency, *Acquisition of Technical Data and Rights for Major Army Systems*, Audit Report: A-2009-0143-ALC, Department of the Army, July 6, 2009.
- 275 U.S. Army Audit Agency, *Army's Operational Needs Statement Process*, Audit Report: A-2008-0014-ALA, Department of the Army, November 13, 2007.
- 276 U.S. Army Audit Agency, *Benefits of Public-Private Partnerships*, Audit Report: A-2008-0058-ALM, Department of the Army, February 7, 2008.
- 277 U.S. Army Audit Agency, *Weapons Systems Sustainment Planning*, Audit Report: A-2009-0XXX-ALM, Department of the Army, September 3, 2009.
- 278 U.S. Army G-3/5/7, "CS CONOPS Staffing Timeline," briefing chart, August 24, 2010.
- 279 U.S. Army Materiel Systems Analysis Activity, *Army Materiel Management Strategy Study*, Fort Belvoir, Va.: U.S. Army Materiel Command, September 25, 2009.
- 280 U.S. Army, "Acquisition & Other Savings: POM/BES FY06-11," briefing charts, no date.

- 281 U.S. Army, "Army Investment Decisions," briefing charts, FOUO.
- 282 U.S. Army, "System Kills: POM 99-05," briefing charts, no date.
- 283 U.S. Army, *2010 Weapon Systems*, 2009. As of August 28, 2010:
<http://www.fas.org/man/dod-101/sys/land/wsh2010/index.html>
- 284 U.S. Army, *Monthly RDECOM Manpower Strength Report – August 2010*
- 285 U.S. Code Title 10, *Armed Forces*, U.S. House of Representatives. As of 19 January 2011: http://uscode.house.gov/download/title_10.shtml.
- 286 U.S. General Accounting Office, *1993 DOD Budget: Potential Reductions in Command, Control, and Communications Satellite Programs*, Washington, D.C., GAO/NSIAD-92-289BR, September 1992.
- 287 U.S. General Accounting Office, *Acquisition of Major Weapon Systems*, Washington, D.C., B-163053, 17 July 1972.
- 288 U.S. General Accounting Office, *Acquisition Reform: Efforts to Reduce the Cost to Manage and Oversee DOD Contracts*, Washington, D.C., GAO/NSIAD-96-106, April 1996.
- 289 U.S. General Accounting Office, *Best Practices: Better Management of Technology Development, Can Improve Weapon System Outcomes*, Washington, D.C., GAO/NSIAD-99-162, 30 July 1999.
- 290 U.S. General Accounting Office, Comptroller General of the United States memorandum to John C. Stennis, 15 March 1974.
- 291 U.S. General Accounting Office, *Defense Acquisitions: Comanche Program Cost, Schedule, and Performance Status*, Washington, D.C., GAO/NSIAD-99-146, August 1999.
- 292 U.S. General Accounting Office, *Defense Acquisitions: Higher Priority Needed for Army Operating and Support Cost Reduction Efforts*, Washington, D.C., GAO/NSIAD-00-197, September 2000.
- 293 U.S. General Accounting Office, *Defense Advanced Research Projects Agency's Approach to the Management of Technology Transfer to the Military Services*, Washington, D.C., B-167034, 14 March 1974.
- 294 U.S. General Accounting Office, *Future Years Defense Program: Actions Needed to Improve Transparency of DOD's Projected Resource Needs*, Washington, D.C., GAO-04-514, May 2004.
- 295 U.S. General Accounting Office, *Military Satellite Communications: Milstar Program Issues and Cost-Saving Opportunities*, Washington, D.C., GAO/NSIAD-92-121, June 1992.
- 296 U.S. General Accounting Office, *Payments For Independent Research and Development and Bid and Proposal Costs*, Washington, D.C., B-167034, 16 April 1973.
- 297 U.S. General Accounting Office, *Staff Study: Advanced Attack Helicopter*, Washington, D.C., March 1974.
- 298 U.S. General Accounting Office, *Test and Evaluation: DOD Has Been Slow in*

- Improving Testing of Software-Intensive Systems*, Washington, D.C., GAO/NSIAD-93-198, September 1993.
- 299 U.S. Government Accountability Office, *Improved Services Knowledge of DoD Services Contracts could Reveal Significant Savings*, Washington, D.C., GAO - 03-661, 9 June 2003,
- 300 U.S. Government Accountability Office, *Acquisition Policies*, briefing charts to the House Appropriations Committee Defense Subcommittee Staff, April 2009, FOUO.
- 301 U.S. Government Accountability Office, *Better Acquisition Strategy Needed for Successful Development of the Army's Warrior Unmanned Aircraft System*, Washington, D.C., GAO-06-593, May 2006.
- 302 U.S. Government Accountability Office, *Better Support of Weapon System Program Managers Needed to Improve Outcomes*, Washington, D.C., GAO-06-110, November 2005.
- 303 U.S. Government Accountability Office, *Case Studies of Selected Urgent Need Requests*, Washington, D.C., c. 2009 - 2010, FOUO.
- 304 U.S. Government Accountability Office, *Defense Acquisition Programs: Status of Selected Systems*, Washington, D.C., GAO/NSIAD-90-30, December 1989.
- 305 U.S. Government Accountability Office, *Defense Acquisitions: Army Aviation Modernization Has Benefited from Increased Funding but Several Challenges Need to Be Addressed*, Washington, D.C., GAO-09-978R, September 28, 2009.
- 306 U.S. Government Accountability Office, *Defense Acquisitions: Assessments of Selected Weapon Programs*, Washington, D.C., GAO-10-388SP, March 2010.
- 307 U.S. Government Accountability Office, *Defense Acquisitions: DOD's Requirements Determination Process Has Not Been Effective in Prioritizing Joint Capabilities*, Washington, D.C., GAO-08-1060, September 2008.
- 308 U.S. Government Accountability Office, *Defense Acquisitions: Strong Leadership is Key to Planning and Executing Stable Weapon Programs*, Washington, D.C., GAO-10-522, April 2010.
- 309 U.S. Government Accountability Office, *Defense Management: DOD Needs Better Information and Guidance to More Effectively Manage and Reduce Operating Support Costs of Major Weapons Systems*, Washington, D.C., GAO-10-717, July 2010.
- 310 U.S. Government Accountability Office, *Depot Maintenance: DOD's Report to Congress on Its Public-Private Partnerships at Its Centers of Industrial and Technical Excellence (CITEs) Is Not Complete and Additional Information Would Be Useful*, Washington, D.C., GAO-08-902R, July 1, 2008.
- 311 U.S. Government Accountability Office, *DOD Should Strengthen Policies for Assessing Technical Data Needs to Support Weapon Systems*, Washington, D.C., GAO-06-839, July 2006.
- 312 U.S. Government Accountability Office, *Increased Focus on Requirements and*

- Oversight Needed to Improve DOD's Acquisition Environment and Weapon System Quality*, Washington, D.C., GAO-08-294, February 2008.
- 313 U.S. Government Accountability Office, *Many Analyses of Alternatives Have Not Provided a Robust Assessment of Weapon System Options*, Washington, D.C., GAO-09-665, September 2009.
- 314 U.S. Government Accountability Office, *Warfighter Support: Improvements to DOD's Urgent Needs Processes Would Enhance Oversight and Expedite Efforts to Meet Critical Warfighter Needs*, Washington, D.C., GAO-10-460, April 2010.
- 315 U.S. Government Accountability, *Army Modernization: The Warfighting Rapid Acquisition Program Needs More Guidance*, Washington, D.C., GAO/NSIAD-99-11, November 2008.
- 316 U.S. House of Representatives, House Armed Services Committee Democrats, "Hearing: Defense Acquisition Reform Panel: Coordinating Requirements, Budgets, Acquisition: How Does It Affect Costs and Acquisition Outcomes?", 3 June 2009. As of 19 January:
http://democrats.armedservices.house.gov/index.cfm/hearings?ContentRecord_id=4de7749a-37d5-45ad-a706-8095df04bb10.
- 317 Undersecretary of Defense for Acquisition, Logistics and Technology, *Implementation Directive for Better Buying Power*, memorandum, 3 November 2010.
- 318 Undersecretary of Defense for Acquisition, Logistics and Technology, *Implementation of WSARA 2009*, Directive Memorandum (09-027), 4 December 2009.
- 319 US Army MANPRINT Program, "Moving MANPRINT to the Left," briefing charts for LTG Michael E. Vane, 17 November 2010
- 320 Vane, Michael E., "ARCIC Lessons Learned and Insights," briefing charts ARCIC, 1 November 2010.
- 321 Walker, David M., *Defense Acquisitions: Employing Best Practices Can Shape Better Weapon System Decisions*, testimony delivered before the Subcommittee on Readiness and Management Support, Committee on Armed Services, U.S. Senate, Washington, D.C., 26 April 2000, GAO/T-NSIAD-00-137.
- 322 Welby, Steven, "Development Planning," briefing charts, Office of the Director, Defense Research and Engineering, 24 May 2010, FOUO.
- 323 Wirthlin, Joseph Robert, *Identifying Enterprise Leverage Points in Defense Acquisition Program Performance*, thesis, Massachusetts Institute of Technology, September 2009.
- 324 Wolfe, Frank, "Appropriators Cancel SADARM, FSCS Funding," *Defense Daily*, July 18, 2000.
- 325 Wolfe, Frank, "Raytheon Lobbies Hill For Stinger Block II Restoration," *Defense Daily*, February 3, 2000.
- 326 Wong, Ernest Y., *Leveraging Science in the Manoeuvrist Approach to*

Counterinsurgency Operations, Arlington, VA: Institute of Land Warfare, Association of the U.S. Army, October 2010.