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THESIS

CONTRACTING FOR LIFE-CYCLE CONTRACTOR SUPPORT FOR ARMY TACTICAL MISSILE SYSTEMS

by

Beverly J. Fuller

December 2002

Thesis Advisor: David F. Matthews
Associate Advisor: Donald C. Barker

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Government interest has increased in recent years regarding the viability of contracting out for the Life-Cycle Support of military weapon systems. This thesis addresses the legal ramifications and possible contracting avenues that Program Managers could use to obtain support for Army tactical missile systems. Congress has enacted numerous statutes that the Program Manager must adhere to regarding depot maintenance activities when considering Life-Cycle Contractor Support.

Within the Program Executive Office (PEO), Tactical Missiles, two programs have received approval for contracting out support efforts. One program awarded a contract in 2000 and the second is in the planning stages. The potential exists for numerous programs to pursue this avenue for supporting DoD weapon systems.

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CONTRACTING FOR LIFE-CYCLE CONTRACTOR SUPPORT FOR ARMY TACTICAL MISSILE SYSTEMS

Beverly J. Fuller
Department of the Army Civilian
B.S., University of Alabama in Huntsville, 1987

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December 2002

Author: Beverly J. Fuller

Approved by: David F. Matthews, Thesis Advisor

Donald C. Barker, Associate Advisor

Douglas A. Brook, PhD.
Dean, Graduate School of Business and Public Policy

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ABSTRACT

Government interest has increased in recent years regarding the viability of contracting out for the Life-Cycle Support of military weapon systems. This thesis addresses the legal ramifications and possible contracting avenues that Program Managers could use to obtain support for Army tactical missile systems. Congress has enacted numerous statutes that the Program Manager must adhere to regarding depot maintenance activities when considering Life-Cycle Contractor Support.

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I. INTRODUCTION

A. PURPOSE

The research paper studies the various ways of contracting for logistical support throughout the life cycle of an Army tactical missile system and presents lessons learned from major Army weapon systems. It presents the backgrounds of the Department of Defense logistical environment, contracting approaches utilized by various systems, and lessons learned by the programs from the process of gaining approval of their support concepts. Additionally, it incorporates the financial aspects of funding contractor life cycle support into the contracting options available for program managers of Army tactical missile systems.

B. BACKGROUND

The General Accounting Office (GAO) reported to Congress concerning the Army's poor management of supporting weapon systems subsequent to fielding. The report led to the Department of Defense (DoD) investigation into numerous ways to reduce the increasing costs associated with the operations and sustainment of fielded weapon systems and identified ten pilot programs to implement Life Cycle Contractor Support (LCCS) strategies. The current Acquisition Reform environment provides opportunities for contractors to develop, manufacture, and sustain systems throughout their life cycle. The first Army program to attempt a LCCS approach was unsuccessful in gaining approval by Army leadership. However, two programs within the Program Executive Office (PEO), Tactical Missiles, obtained approval and are currently either contracting for or initiating contract efforts for LCCS. Both the Air Force and Navy embraced LCCS efforts and can potentially provide roadmaps for Army efforts. The

proposed research incorporates this information to provide alternatives available for LCCS pertaining to Army tactical missiles.

C. RESEARCH QUESTIONS

1. Primary Research Question

What various contracting opportunities exist to provide Life Cycle Contractor Support (LCCS) for Army tactical missile systems?

2. Secondary Research Questions

a. Why Does LCCS Interest the DoD and the Army?

b. Does the System's Life Cycle Determine a Specific Contract Method?

c. What Does the Army Contract For In This Environment?

d. What Contractor Incentives Are Possible To Improve Performance?

e. What Legal Ramifications Exist Regarding LCCS?

D. SCOPE OF THESIS

The thesis is a possible implementation guide for Army tactical missile systems only. The study includes impacts/opportunities for missiles and their launch platforms relative to management by the Program Executive Officer (PEO) for Tactical Missiles. It does not include Army helicopter or tracked vehicle platforms. Due to the limited numbers of predecessors for Army LCCS, the study focuses on the Javelin weapon system and its endeavors to obtain LCCS approval from both the DoD and the Army.

E. METHODOLOGY

Research consists of analyzing missile/platform logistics requirements within the framework of the current Acquisition Reform environment. New DoD policies and guidelines exist without providing clear direction for implementing LCCS. With this in mind, research involves the Congressional mandates regarding core capabilities, wartime constraints, surcharges, etc. It also includes the Air Force and Navy avenues utilized for LCCS. The obtained information comes from existing and/or historical contracts, Congressional Appropriations Laws, USC Title 10, DoD/DA policies and guidelines, along with interviews with logistics personnel, contracting officers, and legal personnel.

F. ORGANIZATION

Chapter II describes the environment associated with logistics support and, in broad terms, the Army's tactical missile weapon systems along with their historical sustainment perspectives. The chapter concludes with a summarization of the information presented.

Chapter III consists of a discussion of the legal constraints and issues relative to supporting and monitoring expenditures imposed by Congress. A description of sustainment issues affecting the Army relative to missiles and their launch platforms is provided and the chapter concludes with a summarization.

Chapter IV presents an explanation of both actual and potential contractual vehicles along with lessons learned from previous attempts to gain Army approval to initiate LCCS. It includes both monitoring and financial aspects required to answer Congressionally-imposed mandates on program managers. A chapter summary completes this section.

Chapter V, the final chapter of this thesis, summarizes the information obtained during the research and answers the research questions presented in Section C, above. The chapter ends with recommendations for further study.

G. BENEFITS OF STUDY

The PEO, Tactical Missile is responsible for the total life cycle efforts relative to Army tactical missiles and many of their launch platforms. The proposed thesis can provide possible alternatives for contracting support and sustainment of their tactical weapon systems. It also provides insight into the legal aspects involved with contracting outside of the depot maintenance environment.

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II. BACKGROUND

A. INTRODUCTION

The Department of Defense (DOD) established initiatives in April 1998, giving more responsibility to program managers for the total life cycle cost of developed weapon systems. The Strom Thurman National Defense Authorization Act for Fiscal Year 1999 directed the Defense Department to select and report on ten (10) programs to Congress on the implementation efforts associated with the initiative. DOD established broad goals for the reduction of weapon system's operating and support (O&S) costs. DOD expected an increase in available funding for Research, Development, Test and Evaluation (RDT&E) and Procurement projects. The DOD goal was to experience a reduction of 20 to 50 percent in projected life-cycle costs by fiscal year 2000, and a 20 percent decrease in O&S costs for fielded systems by fiscal year 2005. (GAO, 2000)

In September 2000, the General Accounting Office (GAO), the auditing arm of Congress, studied the Army's policies implemented in response to the DOD initiatives and reported their lack of faith in the Army's ability to adequately reduce costs based upon two findings. The first finding stated,

> The Army…[lacked accountability assignment] for O&S cost reductions nor [requirement establishment] that each weapon system achieve a specific level of cost reductions.

GAO's second finding stated, the Army

> …lacks complete and reliable data on the actual operating and support costs of the weapon systems that are being replaced.

The deficiency of data encumbers the program managers' efforts to credibly estimate O&S costs, which consequently precludes any meaningful evaluation of a project's success in achieving the DOD goal. GAO cited the Army's budgeting process for O&S efforts as a reason for the lack of information regarding fielded systems, primarily because information systems within the Army do not maintain detailed O&S expenditure costs by either weapon system or particular aspects of support. (GAO, 2000)

B. APACHE PRIME VENDOR SUPPORT EFFORTS

Pursuant to the National Defense Authorization Act for Fiscal Year 1998, the Department of Defense designated the AH-64 Apache helicopter as a pilot program to initiate improvements in the program management responsibility for life-cycle support of major weapon systems. (GAO, 1999) The current sustainment costs for the AH-64 are the most expensive in the Army and the sixth most expensive in the Defense Department. (Williams, 2000) The Apache support costs represented 22% of the Army Working Capital Fund expenditures and comprised $50 to $60 million of the Army Materiel Command's sustainment expenditures. (Williams, 2000) Neither the Army's supply system nor the contractors for repair parts, have incentives to reduce costs or improve system reliability. (Williams, 2000) In an attempt under acquisition reform, the Program Manager and PEO Aviation submitted an unsolicited proposal from Boeing and Lockheed Martin for a prime vendor support concept. The proposed logistics efforts would assume that all of the traditional efforts currently performed by Government-managed entities, would be transferred to a contractor team designated Team Apache Systems. (GAO, 1999)

The concept raised significant issues, both financial and operational. A primary issue consisted of how the Army owned parts inventory would be converted to contractor control while retaining Army ownership. Another issue involved costing/funding questions raised by Army Cost and Economic Analysis Center, Army Audit Agency, and Army Comptroller. Finally, significant impacts on the Army's support infrastructure due to Apache PVS would arise, such as: pairing with existing structure, adverse impacts during transition to war, and limited commanders' flexibility to meet changing funding needs. (GAO, 1999)

In 1999, the Army and Defense Department set 2001 as a milestone for completing all analysis and deciding whether or not to implement Apache PVS. When the date was reached, the issues were not adequately resolved, and DoD refused to permit the Army to proceed with the plan. The decision was based on an inability to resolve key issues. The Program Manager offered to provide funding to the Army Working Capital Fund (AWCF) commensurate with the estimated impacts to remaining AWCF

participants due to Apache's withdrawal to PVS. The Army Comptroller turned down the offer. The Corpus Christi Army Depot American Federation of Government employees and the contractor did not reach an agreeable position regarding work sharing and teaming. Due to the large quantity of affected Government employees, an A-76 study was conducted and eventually included the Inspector General, Army Audit Agency, and the General Accounting Office. Because of these issues, Army leadership sought other systems to use as pilot programs and turned to the Program Executive Office (PEO), Tactical Missiles to offer projected programs – preferably systems that had not entered the Army Working Capital Fund infrastructure. (Williams, 2000)

C. ARMY TACTICAL MISSILE SYSTEMS

The Program Executive Office, Tactical Missiles is responsible for the management of Army tactical missile systems. PEO responsibilities include:

> Army centralized manager for assigned programs reporting directly to the Army Acquisition Executive; provide overall direction and guidance for the development, acquisition, testing, production, product improvements, fielding and sustainment; place primary management emphasis and oversight on total life cycle cost, schedule, and performance while ensuring compliance with applicable national policies such as environmental protection and socio-economic programs; and maintain a total Army perspective in managing assigned programs and keep the Senior Army Leadership fully apprised of program status, to include problems which could affect the Army's ultimate commitment to the program. (PEO TM Weapon Systems Book, 2002)

Oversight is provided for the following weapons systems: Improved Target Acquisition System, Multiple Launch Rocket System, High Mobility Artillary Rocket System (HIMARS), Army Tactical Missile System, Longbow HELLFIRE Missile System, 2.75 inch Rocket System, Common Missile System, JAVELIN Weapon System, Kinetic Energy Missile System, and the Advanced Precision Kill Weapon System. A more in-depth discussion of the programs follows.

D. MISSILE SYSTEMS AND LAUNCH PLATFORMS

Missiles are most frequently considered "wooden" rounds not requiring periodic maintenance or support. Fielding consists of delivery to a missile storage facility or depot. Removal only occurs with unit deployment or for training firings. Launch platform utilization is much heavier and results in requirements for spares, repair parts,

petroleum, lubricants, and software upgrades. If the program manager has responsibility for the launch platform, it becomes the focus of O&S cost reduction efforts because it is the primary cost driver during the sustainment phase of the weapon system's life. (GAO, 2000)

Due to the DOD initiatives to reduce O&S costs, many programs are analyzing types of maintenance support as a means to reduce costs. Two basic forms of support exist: organic – support/maintenance performed by soldiers; and contracted – a contractor, usually the system developer, performs efforts normally conducted by soldiers. Various mixtures can exist between the three levels of direct support, general support, or depot maintenance. DOD refers to these categories as Organization Maintenance (support performed at the operational site), Intermediate Maintenance (tasks performed by mobile, semi-mobile, and/or fixed specialized organizations and installations), and Depot Maintenance (the highest level of maintenance that supports efforts above and beyond the capabilities of Intermediate Maintenance). (Blanchard, 1992) This thesis concentrates on the depot maintenance level for support and the methods to contract for the effort. Three programs within PEO, Tactical Missiles were provided to DOD as pilots to implement Life Cycle Contracted Support concepts. Others may follow if these three prove successful.

1. Systems Organically Supported

Within the PEO, Tactical Missile family of systems, the TOW Ground Support System, the Longbow HELLFIRE, 2.75 inch Rocket, and the M270 Multiple Launch Rocket System (MLRS) receive organic support. The launch mechanisms require support since the missiles are designated wooden rounds.

The AH-64D Longbow Apache helicopter utilizes the Longbow HELLFIRE missile to provide the capability to engage targets in both day and night, adverse weather conditions, and with battlefield obscurants present. The Longbow HELLFIRE complements the semi-active Laser HELLFIRE missile by offering fire-and-forget capability against a given target set. The missile consists of a radio frequency guidance section that provides both lock-on before launch (LOBL) and lock-on after launch (LOAL). (DOD, 2001)

Figure 2-1. Longbow HELLFIRE Missile from the AH-64D helicopter.

The M270 Launcher also receives organic support. This system is a multi-national enterprise between the United States Army, Great Britain, Germany, France, and Italy, and also serves several additional FMS customers. The system fires a MLRS Family of Munitions (MFOM) such as the MLRS rocket, Extended Range MLRS rocket, Guided MLRS rocket, and several variants of the Army Tactical Missile System. Red River Army Depot provides depot-related support services for the system. (DOD, 2001)

Figure 2-2. Multiple Launch Rocket System.

2. Systems With Approved Life-Cycle Contractor Support

Systems within the PEO family that obtained approval for Life Cycle Contractor Support are the Army Tactical Missile System (ATACMS), the Improved Target Acquisition System (ITAS), and the Javelin system. The first is a guided missile, the second is a target acquisition system used with the TOW missile, and the last is a shoulder-fired missile with a command launch unit.

The ATACMS Block II system provides deep fires to Army Objective Force and Joint Forces Commanders to delay and disrupt threat-armored forces at ranges in excess of 100 kilometers. The missile has a low sustainment costs since it is considered a certified round due to having a predictable and acceptable level of reliability over a specified certification period. The system was battle-proven during Desert Storm. (DOD, 2001)

Figure 2-3. Army Tactical Missile System.

The ITAS evolved out of the combat-proven Ground TOW System and provides for both a passive and active laser ranging, a second-generation forward-looking infrared (FLIR) sight, improved direct-view optics, an aided target tracker, embedded training capability, and built-in-test diagnostics. These enhancements provide a significant improvement in the probability of hit and a dramatic improvement in target detection over the previous Ground TOW sighting system. (CCMS, 2002)

The Javelin system is a medium range, imaging infrared, fire-and-forget, manportable antitank weapon system developed by the U.S. Army and the U. S. Marine Corps. Javelin satisfies an operational requirement to provide increased reliability, survivability, higher hit/kill probability, and greater effective range against current and future armored threats. It is comprised of a tactical round (wooden round), a command launch unit (CLU), and a set of training devices. The CLU and training devices require support and maintenance following fielding. (DOD, 2001)

Figure 2-4. Javelin Weapon System.

3. Systems Considering LCCS

The High Mobility Artillery Rocket System (HIMARS) answers an Army need for a rapidly-deployable fire support delivery system capable of delivering the MLRS Family of Munitions (MFOM) in support of airborne, air assault divisions, and forced/early entry contingency operations. The system is transportable by C-130 aircraft whereas the M270 and M270A1 are not. It is a wheeled version of the MLRS launcher and is mounted and fully-integrated on a 5-ton Family of Medium Tactical Vehicles (FMTV) truck chassis. The vehicle will carry one launch pod of six MLRS rockets or one ATACMS missile and be capable of firing all current and future MFOM rockets and missiles. It utilizes the same Improved Fire Control System (IFCS) as the M270A1 and is fully interoperable with all Allied and North Atlantic Treaty Organization MLRS users. (Precision Fires, 2002)

The M270A1 Launcher recapitalizes the MLRS M270 basic launcher and upgrades both the fire control system and the launcher mechanical system. The IFCS corrects present and future supportability problems in the current MLRS Fire Control System resulting from electronic component obsolescence. Reduced operation and support costs are expected along will growth capabilities for existing and future MLRS Family-of-Munitions systems. The Improved Launcher Mechanical System decreases the stow-to-aim point time line, enhances effectiveness in engaging and supporting the force, while increasing the MLRS platform survivability. (DOD, 2001)

Figure 2-5. M270A1.

The Advanced Precision Kill Weapon System (APKWS) builds upon the 2.75 inch Rocket System and the technology developed for the Longbow HELLFIRE. The APKWS is a low cost laser-guided rocket that evolved from the HYDRA-70 2.75-inch rocket system. It will be compatible with all Army attack and reconnaissance helicopters. United States forces will utilize the system across the full spectrum of operations and find it complementary to the current unguided rockets, anti-tank missiles, and cannon of current and planned helicopters. A decision between organic and contracted support will be made in the future. (APKWS Core Depot Assessment, 2002)

E. SUMMARY

The DOD supply infrastructure is costly to maintain and continues to deplete the funding available to develop and produce new, more technically advanced weapon systems. The technical nature of new systems requires more support from developers, such as prime contractors, to maintain readiness levels. The outcome is a spiral of increasing costs for older systems and reduced funding for new methods to decrease those same costs. Congress mandated that the Defense Department initiate a program comprised of weapon systems from all the Services to implement acquisition reforms resulting in reduced operation and support costs. Reduced support costs while increasing funding for new developments and productions was the goal.

The Army proposed using the AH-64 Apache program as the primary pilot program with a far-reaching plan to pass traditional logistical efforts performed by the Government to a contractor team made up of Boeing and Lockheed Martin. The effort met great resistance within the traditional logistics management members. The Army CEAC, Army Audit Agency, and Army Comptroller questioned the proposed savings associated with the dollars to pay the Working Capital Fund for spares given to contractor. Apache PVS was not implemented and the Army looked to the PEO, Tactical Missiles to offer potential participants. Three programs, ITAS, Javelin, and HIMARS, formally participate in the program. Of these, ITAS and Javelin have successfully obtained approval from the Army leadership to implement LCCS concepts. HIMARS is seeking approval concurrently with their Low Rate Initial Production Milestone. Other programs may follow and they must meet both statutory and regulatory requirements to implement further strategies.

III. CONSTRAINTS REGARDING LCCS

A. STATUTES

Webster's Dictionary, defines statutes as a law passed by a legislative body to govern actions. (Neufeldt, 1995) Within the Defense acquisition community, United States Code, Title X, serves the purpose of written law governing the activities to develop, produce, and support weapon systems utilizing taxpayers' dollars. Congress approves and passes the laws that the President of the United States, through the Defense Department, executes or adheres to. Before contracting for Life-Cycle Contractor Support, one must familiarize themselves with Title X, Chapter 146, Contracting for Performance of Civilian Commercial or Industrial Type Functions. This study focuses on those laws, Federal Acquisition Regulations, Government policies, and guidelines associated with weapon system maintenance and contracting for services. (Title X, 2002)

1. Section 2460 – Definition of Depot-Level Maintenance and Repair

Within Chapter 146, the term depot-level maintenance and repair is defined as material maintenance or repair requiring the overhaul, upgrading, or rebuilding of parts, assemblies, or subassemblies, and the testing and reclamation of equipment as necessary, regardless of the source of funds for the maintenance or repair. It also includes all aspects of software maintenance as depot-level maintenance and repair, as well as, interim contractor support or contractor logistics support (or any similar contractor support) pertaining to efforts defined in the previous sentence. It does not include procurement of major modifications or upgrades of weapons designed to improve their performance, nor does it include the procurement of parts associated with safety improvements or modifications. It does include the installation of the procured parts if the depot performs the effort. This thesis concentrates on activities covered under the primary definition and does not focus on software maintenance that is often acquired using a separate Engineering Services contract. (Title X, 2002)

2. Section 2466 – Limitations On the Performance of Depot-Level Maintenance of Material

Section 2466 of Chapter 146, involves the definition of the limitation for funds usage for a fiscal year for a military department or defense agency for depot-level

maintenance and repair workload. The limit applies to contracted workload performed by non-Federal Government entities except for the Sacramento Army Depot (SAD) in Sacramento, California, which was excluded from Section 2466 compliance, until its closure in 1995. Since 1997, the limit remains at 40% of the workload required to maintain and repair equipment. The Secretary of Defense must submit an annual report to Congress identifying by each department and Defense Agency, the percentage of funding used for contracted maintenance and support expended in the preceding fiscal year. This section of Title X provides the basis for the large amount of the Office of the Secretary of Defense (OSD) and Army scrutiny prior to approval for LCCS activities. (Title X, 2002)

Section 331 of Public Law 103-337 stated the following important Congressional findings associated with depot-level maintenance activities:

> (1) By providing the Armed Forces with a critical capacity to respond to the needs of the Armed Forces for depot-level maintenance and repair of weapon systems and equipment, the depot-level maintenance and repair activities of the Department of Defense play an essential role in maintaining the readiness of the Armed Forces.
>
> (2) It is appropriate for the capability of the depot-level maintenance and repair activities of the Department of Defense to perform maintenance and repair of weapon systems and equipment to be based on policies that take into consideration the readiness, mobilization, and deployment requirements of the military departments.
>
> (3) It is appropriate for the management of employees of the depot-level maintenance and repair activities of the Department of Defense to be based on the amount of workload necessary to be performed by such activities to maintain the readiness of the weapon systems and equipment of the military departments and on the funds made available for the performance of such workload. (Title X, 2002)

Congress mandated competition pilot programs as part of Public Law 101-510 for fiscal year 1991, but it was repealed by Public Law 102-190 in 1991 and added additional requirements for a Comptroller General review and a Secretary of Defense five-year strategy describing the anticipated cost savings associated with the use of the procedures. This law supports the requirement to conduct economic analyses of potential contracting strategies for LCCS. (Title X, 2002)

3. Section 2469 – Contracts To Perform Workloads Previously Performed By Depot-Level Activities of the Department of Defense: Requirement of Competition

Section 2469 mandates the use of merit-based selection procedures among all depot-level activities within the Defense Department or competitive procedures among private and public sector entities. It applies to any workload with a value of $3 million or more that is currently a part of the Department of Defense. In 1994, Congress changed the law to prohibit the changing of Federal-Government depot-level maintenance and repair performance efforts to contracted efforts without conducting competition. (Title X, 2002)

4. Section 2469a – Use of Competitive Procedures In Contracting For Performance of Depot-Level Maintenance and Repair Workloads Formerly Performed at Certain Military Installations

Section 2469a further refines the law outlined in Section 2469 to include closed or realigned military installations that formally closed as part of the 1995 Defense Base Closure and Realignment Act of 1990 except for the workload deemed necessary to maintain a core logistics capability identified under section 2464 of Title X. The Section further outlines the review procedures for competitively contracting depot-level activities associated with closed or re-aligned military installation efforts along with resolution of workload award objections. (Title X, 2002)

5. Sections 2464 – Core Logistics Capabilities

Public Law 105-85, Section 356, added the requirement for the Department of Defense to maintain a core logistics capability that is Government-owned and operated (meaning workload performed by Government personnel at Government-owned facilities using Government-operated equipment) for a

> … ready and controlled source of technical competence and resources necessary to ensure effective and timely response…

to national emergencies. The Secretary of Defense must identify the core logistics capabilities required to maintain and repair weapon systems and military equipment (including mission-essential equipment or materiel) not later than four years following initial operational capability. Core logistics capabilities can exclude systems and equipment under special access programs, nuclear aircraft carriers, and commercial

items. The Chairman of the Joint Chiefs of Staff must consult on the identification to assure the ability of the armed forces to meet defined strategic and contingency plans. The law also mandates that the Secretary of Defense assign sufficient workload to ensure cost efficiency and technical competence in peacetime while preserving surge capacity and reconstitution capabilities necessary to support the strategic and contingency plans defined by the Chairman of the Joint Chiefs of Staff. (Title X, 2002)

Prohibitions exist against contracting for the core logistics workload unless the Defense Secretary waives the exception and states that the effort no longer meets the national defense reason requirements. The waiver must include criteria for determining why the workload does not need maintaining within the core logistics environment. The Senate's Committees on Armed Services and Appropriations, along with the House of Representatives' Committees on Armed Services and Appropriations, receive the waivers for Congressional review. Waiver approvals cannot take effect until the expiration of the first 30-day period of continuous Congressional session. (Title X, 2002)

Public Law 105-261, added that the Secretary of a military department cannot enter into a contract for prime vendor support until the Secretary submits a report to Congress outlining the competitive procedures used to award the contract and an analysis of the cost savings and benefits to the Government for the life of the contract. Definitions for prime vendor contract included prime vendor support contracts, flexible sustainment contracts, and direct vendor delivery contracts. The law applies to Life-Cycle Contractor Support. (Title X, 2002)

Section 2464 also governs commercial items (and weapon systems classified as commercial items). The Secretary of Defense must notify Congress of the determination and present the associated justification for the finding. The justification includes an estimated percentage of commonality of parts between the commercial marketplace item and the Government version; the value of unique support, test equipment, and tools necessary for military requirement support; and an estimated life-cycle logistics support cost comparison between commercial and Government support. (Title X, 2002)

B. FEDERAL ACQUISITION REGULATIONS AND DEFENSE FEDERAL ACQUISITION REGULATIONS

The Federal Acquisition Regulations (FAR) incorporates statutes relative to contracting with federal agencies. The FAR governs activities including construction, services, and acquisition of weapon systems. The Defense Federal Acquisition Regulation (DFAR) addresses contracting actions pertaining to the Defense Department by incorporating overall policies and Congressional enactments. Each service within the Department of Defense provides specific acquisition regulations referred to as the Army FAR (AFAR), Navy FAR (NFAR), or Air Force FAR (AFFAR). For this thesis, the FAR, DFAR, and AFAR are addressed respective to warranties – tools used by the Program Manager to achieve an objective. Warranties can motivate producers to "design, produce, and deliver" better weapon systems and provide the Government with recourse should performance not meet contractual requirements. A prime example is the incentive warranty that encourages the contractor to improve upon the minimum acceptable performance specification requirement. (ASC Program Managers Warranty Guide, March 2002)

In the early 1970s, the Assistant Secretary of Defense issued a memorandum requesting the services to conduct a trial warranty application in an attempt to lower support costs. This initial concept was known as the Reliability Improvement Program. By the 1980s, the use of warranties (or guarantees as they are often termed) was a standard option, but the application varied by program office. Section 794 of the Defense Appropriation Act of 1984 required major weapon system prime contractors to provide three written guarantees. This was incorporated into Title X, U.S. Code Section 2403 and became effective in 1985. Section 2403 further specified specific remedies for the Government should the contractor fail to meet the guarantees. This law was repealed in 1998 under Public Law 105-85, Section 847 of the National Defense Authorization Act based, in part, on a General Accounting Office report in 1996 that stated annual Defense Department warranty expenditures of $271 million returned only five cents per dollar. GAO stated that warranties for weapon system acquisition was

> not practical and [did] not provide sufficient benefits to the Government. (ASC, 2000)

Title 41, U.S. Code 264, incorporated the Federal Acquisition Streamlining Act of 1994 requirement for contracting officers to incorporate commercial warranties (including extended warranties) when applicable. The law provides for the Government to receive the same warranty terms as offered to the public in typical commercial practice. (ASC, 2000)

Today, FAR Subpart 46.7, Warranties, provides overall guidance for the use of warranties relative to federal acquisition. FAR Subpart 46.703 outlines the use of warranties and Table 3-1 depicts the detailed criteria. FAR Subpart 46.704 presents warranty limitations and FAR Subpart 46.706 outlines specific terms and conditions. Pricing aspects are imparted in Subpart 46.707. FAR, Chapter 46 incorporates the FASA requirement for commercial items (FAR Subpart 46.709) and specific clauses are located in Subpart 46.710. (FAR, 2002)

The DFAR Subpart 246.704 provides authority for the use of warranties in fixed-price type contracts containing quality assurance provisions that reference higher-level contract quality requirements (cohesive with DFAR Subpart 246.202-4). (DFAR, 1998)

C. POLICIES AND GUIDES

Title X forms the basis for further definition by Defense regulations and policies. The Secretary of Defense initiates policies that find themselves incorporated into the services' regulations and guidelines. The Program Executive Officers and Program Managers have the ultimate responsibility of executing the laws and regulations to assure compliance for their programs. The Department of Defense's mandatory document, DOD 5000 series, outlines acquisition requirements for Major Defense Acquisition Programs (MDAPs). Each service then implements their own set of mandatory and guideline documents associated with internal policies embracing the Congressional mandates and the Defense regulations.

1. Joint Aeronautical Commanders' Flexible Sustainment Guide

In July 1999, the Joint Aeronautical Commanders' Group, under the Joint Logistics Commanders, issued a Flexible Sustainment Guide update addressing guidance on Total Ownership Cost, including information on new approaches to long-term contracting, and integrating a Depot Maintenance Decision Process. The guide

incorporates the recent acquisition reform efforts as well as providing useful techniques for determining life-cycle support concepts and contracting strategies. Figure 3-1 denotes a process associated with Reliability Based Logistics Decisions helpful in determining maintenance concepts. The guide supplies an appendix on warranty types associated with LCCS. (JACG, 1999)

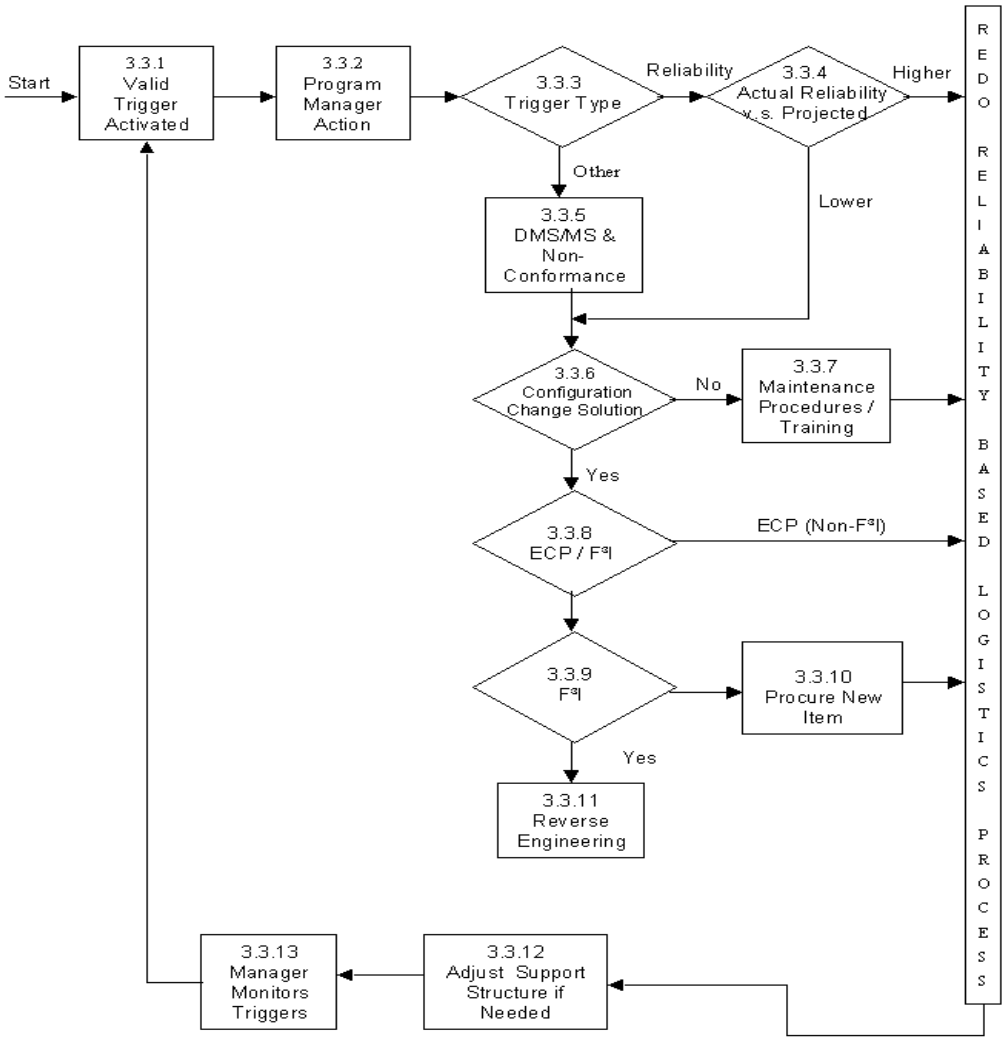

Figure 4. Trigger Based Asset Management (TBAM) Decision Process

Figure 3-1. Reliability Based Logistics Decision Process. (from JACG, 1999, without change)

2. Guidebook For Performance-Based Services Acquisition In The DOD

In January 2001, the Under Secretary of Defense for Acquisition, Logistics, and Technology (USD(ALT)) issued a guidebook with a goal of promoting performance-based strategies for service acquisitions; educating the workforce and highlighting key elements of performance-based services acquisition; promoting use of the commercial market place; and increasing awareness that performance-based acquisition requires participation from all stakeholders. The guide emphasizes the involvement of industry in the process, especially when requirements are complex. It further enunciated the need to move from a narrow-vision view of contract management to a broader-view relative to business management. The document provides examples of positive and negative incentives for contracting use (see Figure 3-2) along with an appendix associated with award terms for use in long-term business relationships between Government and industry. (DOD, Dec 2001)

POSITIVE
When performance exceeds standard, pay x% of monthly payment into pool. At end of y months, pay contractor amount accrued in pool.
When performance exceeds standard, pay x% of monthly payment into pool. When pool has reached y dollars, pay contractor amount accrued in pool.
When performance has exceeded the standard for x consecutive months, reduce government oversight or contractor reporting, as appropriate.
Document past-performance report card, paying particular attention to performance that exceeded the standard.

Courtesy of Jefferson Solutions

NEGATIVE
When performance is below standard for a given time period, x% of that period's payment will be withheld.
When performance is below standard for a given time period, require the contractor to re-perform the service at no additional cost to the government.
When performance is below standard for x consecutive months, increase surveillance or contractor reporting.
Document past-performance report card, paying particular attention to performance that failed to meet the standard.

Courtesy of Jefferson Solutions

Figure 3-2. Positive and Negative Incentives for Contracts. (from DOD, 2001, without change)

3. Modernization Success Spiral

In 1999, the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA(ALT)) issued a memorandum regarding a "Modernization Success Spiral" that included initiatives for managing reliability growth. Increasing reliability leads to longer-lasting spare parts, thus reducing maintenance labor, inventories, and demand for parts storage and transportation. Reduced costs associated with the improved reliability results in increased resources for equipment modernization leading to further replacements of aging equipment, leading again to more reductions in maintenance costs. A success spiral evolves from what was a death spiral (see Figure 3-3). The policy emphasized a focus on lowest Total Ownership Cost versus the previous emphasis on lowest acquisition cost. It further addressed partnering with the Defense Logistics Agency to consider specifications; technical data packages; and especially contracting strategies to focus on achieving the lowest total ownership cost and still yield positive results. (Hoeper, 1999)

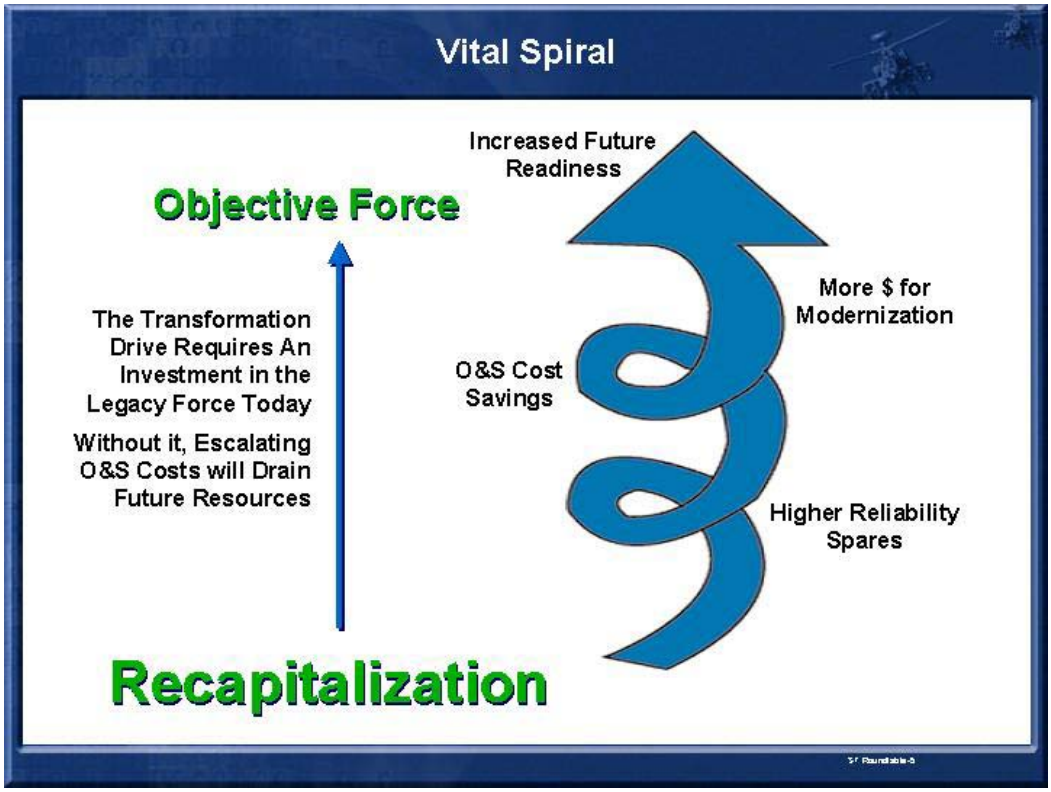

Figure 3-3. Modernization Success Spiral. (from Hoeper, 1999, without change)

4. Army Implementation Of Performance Based Logistics

As part of the September 2001, Quadrennial Defense Review mandate to implement Performance-Based Logistics (PBL), the Army issued a memorandum in April 2002 requesting that Program Managers review Acquisition Category I and II weapon systems for the potential of implementing the philosophy. PBL requires programs to incorporate the following into the product support management planning:

> ...[I]ntegrated supply chains segmented support by system or subsystems;
> Maintaining a relationship with the warfighter based on system readiness;
> Selection of best-value, long-term product support providers and integrators based on competition;
> Measuring support performance based on high-level metrics such as mission capable rates;
> Improved product affordability and system reliability; and
> Dedicated investment in technology refreshment.

The document relayed the requirement from the FY 2003-07 Defense Planning Guidance for submission of Military Department plans identifying PBL implementation schedules for all new weapon systems and ACAT I and II fielded systems. (Bolton, 2002)

5. Contracted Logistics Support Implementation Best Practices Handbook

The PEO, Tactical Missiles, issued its own Guide for implementing Contracted Logistics Support in April 2001 in order to provide the Program Managers of tactical missile systems with a compilation of best practices from regulations, articles, and system support concepts. The handbook includes various contracting methods deemed appropriate for LCCS. The PEO considers this a living document. (PEO, TM, 2001)

D. SUMMARY

The support of the United States military systems and equipment comprises the largest amount of expenditures associated with defense. Due to the costs, Congress has imposed laws and restrictions governing the expenditure of taxpayer resources for contracted support. A program may obtain a waiver through extensive analysis and justification, but contract award must wait until 30 days following Congressional notification.

The Defense Department embraces these laws and has implemented policies, regulations, and guidelines for the services' execution. The Joint Chiefs of Staff for

Logistics issued a Flexible Sustainment Guide to provide further direction and guidance in implementing initiatives in hopes of reducing the sustainment cost burden. It is hoped that the reduced costs will generate funds for developing more reliable equipment and transform what could have ended up as a death spiral into a modernization success spiral.

The Army has further refined the Office of the Secretary of Defense initiatives into guidelines for performance-based acquisitions and logistics. To provide assistance to the programs managed by the PEO, Tactical Missiles, an Integrated Product Team was established with the Aviation and Missile Command's Integrated Materiel Management Center and the PEO to develop a CLS Best Practices Handbook. With the aid of the FAR and DFAR, Program Managers can better define viable contracting activities by leveraging off of the statutes, regulations, policies, and guidelines to contract for LCCS efforts while maintaining readiness levels and congressionally-mandated Government capabilities to meet wartime obligations.

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IV. CONTRACTING FOR LCCS

A. CURRENT CONTRACT APPROACHES

Two programs managed by the Program Executive Office, Tactical Missiles, have received approval for Life-cycle Contractor Support and have either awarded contracts or will do so within the near future. They are the ITAS and Javelin programs within the Close Combat Missile Systems Program Office. Javelin received Department of the Army approval to contract out the Command Launch Unit support in March 2002. Both efforts present similar concepts and lessons learned.

1. ITAS Contract

The Close Combat Missile System Program Office awarded a LCCS contract in FY 2001 for the ITAS. The contract is firm-fixed price with annual awards covering a twelve-month period of performance. Priced options exist allowing for more efficient awarding of follow-on efforts. The program office included unpriced options for "Go-To-War" contingencies. (Barnett, 2002)

Operational Availability (OA) provides the basis for Contractor performance metrics and the foundation for award fee decisions. The contractor obtains optimum award fee when OA exceeds 90%, with the fee amount increasing to 100% as OA approaches 100%. No award fee is given should one Battalion experience an OA less than 90% for two consecutive months, or if three Battalions experience less than 90% OA during an award fee period. (Barnett, 2002)

The contractor receives a negative incentive of both no award fee receipt and an obligation to provide increased spares equal to the number of unfilled requisitions in that month, if a Division experiences less than 90% OA for a month. . Should the Division experience a less than 90% OA for two consecutive months, no award fee is authorized and the contractor must increase spares by the number of unfilled requisitions for the second month. If any one system down time exceeds thirty days, then the contractor receives only 50% of the award fee. (Barnett, 2002)

2. Javelin

The Javelin Weapon System is preparing a LCCS contract to support the Command Launch Unit and associated training devices for the Army, Marine Corps, and future Foreign Military Sales (FMS) participants. The Javelin system plans include contractor and Government teaming arrangement under a firm-fixed price contract for an initial six-month effort beginning in June/July 2003 (if funding permits) with annually awarded contract options for ten years. The United Kingdom (a FMS case to this country is in preparation) has expressed a desire for a twenty-year performance period. The Statement of Objectives delineates a list of firm-fixed price goals consisting of:

Maintaining an OA of 90% at the Army battalion level;

Repair Turn-Around-Time (TAT) of 10 days for Direct Support level maintenance actions;

Repair TAT of 30 days for depot level maintenance actions;

New Equipment Training (NET);

Total Package Fielding (TPF);

Missile surveillance;

One block modification every two years;

LCCS management plan;

Specified number of maintenance actions per year;

Use of existing facilities, personnel, equipment, materials, procedures, and technical data (already in place); and

Software support. (CCMS, 2002)

Firm-fixed price options exist for FMS support, surge usage based on Operating Tempo, and transitioning to organic support, if required. Cost-plus-award fee arrangements include Go-To-War, changes to deployment, NET, and/or TPF, and spares. Contractor incentivization is based on modernization and increasing the system's capability resulting in additional user fighting capabilities. The PM is utilizing Alpha Contracting approach to finalize the contract and the above concepts may change through that process. (CCMS, 2002)

B. POTENTIAL CONTRACTING APPROACHES

The risk associated with the contracted efforts determines the type of contract utilized for LCCS. When determining the contract type, the PM should consider the following items: prior contract performance, risk assessment, acquisition policy, funding projections, and industry responses. Additional factors include pricing history, stability of design (changes equal increased risk), and program life-cycle phase. Potential contract types include firm-fixed price, award term, and cost-plus, coupled with either an incentive fee or award fee. Incentives are integral to a successful contract effort and usually occur in conjunction with pre-described performance metrics. Contract approaches use warranties and teaming arrangements to extend the flexibility for an effective and efficient support concept. Contract type discussion occurs below. (JACG, 1999)

1. Contract Types

a. Award Term

The Air Force uses Award Term contracts for Indefinite Delivery/Indefinite Quantity (ID/IQ) and requirements type efforts. ID/IQ works effectively in the support arena for the procurement of spares and repair parts. Award Term is simply a modification of the Award Fee. In lieu of monetary rewards, the contractor is provided additional periods of performance for successfully fulfilling the Government's requirements. An Award Term Review Board employs an Award Term Plan, developed prior to contract award, to evaluate contractor performance. The Review Board makes a recommendation to a Term Determining Official (TDO), who makes the final decision on the contractor's performance for that period and results in either an extension or reduction in the contract's period of performance. A disadvantage of this contract type is the additional administrative effort and maintenance cost associated with the award term process. Conducting a cost benefit analysis prior to adoption, aids in determining the implementation value. (Air Force, 2002)

The Air Force recently limited the use of Award Term contracts to ID/IQ efforts pending review of fiscal law aspects involving other types of procurement efforts. While the Air Force acknowledges the benefits of efficiency and non-cost incentivization

aspects of Award Terms, concerns exist involving the implications of committing resources prior to appropriation or the unintentional multi-year scenario that could develop. To avoid these issues, the Air Force implemented three conditions for ID/IQ contracts. They are: synopsize and evaluation estimated costs or proposed price of each award term with the basic contract requirement; maximum timeframes in which the ordering period of the contract extension must be specified within the contract, and include a clear statement of the potential for performance period reduction within the synopsis. (Federal Contracts Report, 2002).

b. Firm-Fixed Price

This type of contract can incentivize the contractor through the lowering of performance costs to earn profit. The contract price remains constant (provided there is no increase in the scope of the effort) while the contractor determines how much reduced costs and increased profits are attainable. The risk level is greatest for the contractor under this type of contract. Contract cost reductions occur through increased reliability (thereby reducing the need for spares and repair parts), reduced turn around times for repairs, or anything else that the contractor deems appropriate and achievable. A long-term contract (ten to twenty years) based on firm-fixed pricing may not be attractive to contractors. (JACG, 1999)

A fixed-price incentive fee contract utilizes a specified target cost, target price, a price ceiling, and a profit adjustment formula. The Government and contractor negotiate the final cost and develop the final price through the application of the incentive fee adjustment formula. Risk distribution occurs via the contract target-ceiling price that establishes an upper boundary for the Government's financial liability. The negotiated ceiling allows the contractor to assume an appropriate share of the risk. This contract type is beneficial when both parties can agree, at the beginning, on firm target costs, profit, and the profile adjustment formula that will provide a fair and reasonable incentive. (JACG, 1999)

The fixed-price incentive contract allows the Government to incentivize the contractor for specific areas or efforts since cost is a mandated area for contract performance. Line Replaceable Unit (LRU) reliability factors and overall item life

provide examples of potential incentive provisions. The contractor must focus on the Government's desires in order to earn additional fee, thus providing a strong advantage for this contract type. It is attractive to contractors for long-term contractual arrangements because the Government accepts and shares in the cost risk. A disadvantage is the delay of determining final cost and price until the completion of the effort. This delay can result in the contractor not receiving full financial benefits until fifteen years, or more, following contract initiation. A possible work-around exists through a contract modification allowing the contractor to receive fee benefits based on reliability enhancements. (JACG, 1999)

c. Cost-Plus

A variety of cost-plus type contracts exist including cost-plus incentive fee and cost-plus award fee. Descriptions of these types occur below. Cost-plus contracts shift the risks to the Government since the performance costs can increase above the original contracted amount and the Government agrees to pay all or part of the additional costs to the contractor. Added incentive fees and award fees provide mechanisms to enhance contractor performance for important program specific objectives.

A cost-plus incentive fee contract allows for an initially agreed upon fee that is adjusted later by a formula derived from the relationship of total allowable costs to total target costs. This contract type includes a target cost, target fee, minimum and maximum fees, and a fee adjustment formula. Following contract completion, application of the formula determines the contractor's appropriate fee. The contractor shares incurred costs, above the target-ceiling price, with the Government based on the adjustment formula. Support and sustainment efforts rarely utilize this contract type because it is more appropriate for development and test programs, where the efforts/outcomes exhibit greater risks. (JACG, 1999)

d. Award Fees

The difference between an incentive fee and an award fee contract resides with how and when the contractor earns the fee. Pre-determined formulas, negotiated with the contract, form the basis for incentive fees. For the award fee, a set amount is determined at contract inception and the pool of dollars is set aside for future award. The

contractor earns either all, or a part of, the award fee based upon subjective Government analysis. The award fee's intended goal is to enhance contractor performance in areas critical to program success that are susceptible to subjective measurement and evaluation. Use of award fees is appropriate when the planned work does not support pre-determined objective incentive targets for cost, technical performance, or schedule. It is also appropriate when motivating the contractor to exceptional performance also meets acquisition objectives. Award fees provide the Government with a flexible means to evaluate both achieved performance and environmental conditions. (JACG, 1999)

Evaluation occurs at contractually stated intervals during the performance period to allow the contractor to receive input regarding the quality of their performance. Partial award of the fee usually corresponds to the evaluations. An example of award fee application is associated with providing the contractor with fee increases for reliability improvements at incremental periods throughout the contract's life. (JACG, 1999)

Award fees can reside within any type of contract, at any stage of the product life-cycle, and for supplies or services. Do not limit award fees to best effort contracts. Couple award fee provisions with Fixed-Price efforts to achieve a cost effective means of obtaining and/or managing support efforts. Per Federal Acquisition Regulation (FAR) 16.404-2(c)(3), the contract amount, performance period, and expected benefits must sufficiently warrant the additional administrative effort and costs involved in monitoring and developing evaluations. (JACG, 1999)

2. Incentives and Metrics

a. Operational Availability

Weapon system availability is the ultimate metric to use with performance based logistics and is the Army's designated metric for contract performance evaluation. Every logistics element contributes to system availability: training systems, parts availability, maintenance, subsystem component reliability, transportation, support concept, etc. Areas outside the contractor's control, such as military maintenance personnel, can contribute to non-availability of the system. All cost drivers should be part of the contractor's influence for ultimate benefit. Avoid potential problems by

specifically addressing the contractor's responsibility within the statement of work or statement of objectives. (Schmierer, 2002)

b. Mission Capable (MC) Rate

Another useful availability subset metric is the mission capable rate. MC is often used for subsystems providing specific capabilities. The contractor must improve the subsystem's reliability to prevent adverse impacts to system availability and to assist with meeting the total system's goals. When used alone, MC rate can increase costs unnecessarily if the subsystem is not inherent to the weapon system's mission availability. The two must link contextually for the most cost-effective application. (Schmierer, 2002)

c. System Reliability

Incentivizing subsystem reliability must incorporate the effects upon the total system. Failing to do so can result in unaffordable systems due to inordinate amounts of money used to improve subsystem reliability and increasing the component's cost within the system. The statements above concerning MC rate also apply to system reliability. Improvements to system reliability offer the greatest opportunity to reduce life-cycle support costs.

d. Cost Per Operating Hour

Fielded systems offer more credibility for measuring cost per operating hour than systems currently in development. There is a direct correlation to system availability, but extensive knowledge of weapon system cost drivers must exist and be within the contractor's control. For this reason, do not include military personnel costs when calculating this metric.

3. Warranties

Warranties are an aspect of the contract terms and conditions. They are negotiable and should consider weapon system's planned operational, maintenance, and supply concepts. The FAR and Defense Federal Acquisition Regulation (DFAR) provide statements for utilization in warranty clauses. The clause must clearly state the Government's rights, such as latent defects, fraud, and redesign as a remedy.

Conditions and possible warranties include:

Spare costs less than repair – Reliability Incentive Warranty
Reliability & Maintenance Improvement Warranty
Availability Guarantee
Maximum Parts Guarantee
Spare Parts Level Warranty
Component Reliability Warranty
Repair & Exchange Agreements

Contract repair (costs less than organic) –
Reliability Incentive Warranty
Reliability & Maintenance Improvement Warranty
Availability Guarantee
Logistics Support Cost Guarantee
Maximum Parts Cost Guarantee
Reliability Warranty
Repair & Exchange Agreements

The Government must consider the costs associated with maintaining and enforcing warranties when determining their use. It is very difficult to collect on a warranty claim if ambiguities exist within the contractual language. Use within cost-plus contracts is discouraged due to the likelihood for the Government to share in the cost risks. Warranties are better suited for firm-fixed price contracts awarded for supplies and/or services. PMs should avoid warranty clauses and procedures that impact readiness. They should not impose limited or special reporting requirements on the user personnel (especially at the organizational level). Analysis of all logistics elements ensures the maximum Government use. Factors to consider include transportation and storage. (DAU, 2002)

4. Teaming

Teaming involves the partnering of a Government entity (e.g. a Government-operated depot) and a contractor. Both ITAS and Javelin contracted with the system development contractor that in turn, contracted with a Government depot for the actual

maintenance effort. The contractor manages the effort, supplies parts when required, and provides engineering services to the depot for maintenance activities. This type of arrangement enhances the Defense Department organic depots by allowing them to fulfill the national security need for retaining a depot maintenance capability. The result is a greater private sector investment in the facilities and equipment, improved facility use, reduced total ownership costs, more efficient business processes, workforce integration, and increased credibility.

The National Defense Authorization Act for Fiscal-Year 2002 included two provisions that were extremely beneficial to partnering arrangements. They consisted of and exemption from the percentage limit allowable to DoD for contracted depot efforts and the hold harmless provision against the private sector to include cost, schedule, and quality as a basis for claim filing should the public sector fail to comply with a contract. The Army logistics community encourages partnering arrangements for life-cycle contractor support concepts. (FLE, 2002)

The teaming concept allows an effective means to manage risks between the Government and private sectors. It allows both to efficiently provide those services that best meet the system's availability and stay within the confines of the law for retaining depot capability within the public sector.

C. LESSONS LEARNED

1. Core Depot Assessment

United States Code, Title X mandates performance of a core depot assessment at both Milestone B and C reviews. OSD has developed a set of guidelines PMs must use to answer questions regarding capabilities for repairing their systems within the depot framework. If the capability exists, then the PM may perform a qualitative and quantitative benefit analysis to determine if life-cycle contracted support is feasible. If the maintenance capability does not exist within the existing depot framework, the PM must facilitize and train the depot to perform the effort.

A clear understanding between service logistics agencies and the PM must exist to facilitate the completion of this assessment. This understanding allows the determination of all possible alternatives of interest to the Service and to allow the agency to effectively

communicate the decision to Congressional entities. It is an integral part of the PM's vertical communication exercises.

2. Update Benefit Analysis

The efforts associated with developing a viable benefit analysis highlights the numerous opportunities associated with contractual activities. When changes in the proposed solution occur, it is important to update the analysis to determine if the alternative is the most cost effective solution. Neglecting to do so can result in enlarging the scope of effort beyond the resources of the Service. In today's fiduciary environment, it is a PM's responsibility to provide all information necessary to decision-makers to allow them the ability to make knowledgeable and cost effective decisions.

3. Determine Funding Mechanism Early

Funding constraints impact the type and length of contracts used for LCCS. Three issues related to buying support are the use of operations and maintenance funds, the expiration of funds, and the flow of funding to the PM. The first relates to the color of money and directly correlates to the type of services the PM can buy. Research and development (R&D) funds are used for development and associated testing efforts. Procurement funds allow for the purchase of hardware and services following successful fulfillment of development activities. The operations and maintenance (O&M) funds are used to obtain replenishment parts and services once the hardware is fielded and a decision is made to either support the system via LCCS or through an organic system.

The time limits on funding vary by the color of the money. O&M funds have the shortest life span and cannot always support the modification or improvement of a system or its components. Often, one must use all three types of funding to improve or enhance the weapon system and timing becomes an intricate balancing act.

Finally, the flow of funding to the PM occurs when the PM is the buyer for support services performed outside the typical organic infrastructure. This issue was a primary concern associated with the Apache PVS decision. Systems already part of the Working Capital Fund utilized by the organic infrastructure cannot be easily diverted to the PM for funding contractual efforts.

D. SUMMARY

Contracting for Life-cycle Support involves multiple decisions and activities. Developing a viable business plan must include an efficient and flexible contract type comprised of effective mechanisms to both incentivize and measure contractor performance. ITAS and Javelin chose similar strategies and only time will determine if the mechanisms are sufficient to enhance the system support concepts. Changes in philosophy can occur as information is gathered and incorporated into the benefit analysis allows for the informed selection of cost effective approaches. Cost cannot comprise the only decision-making criteria; use of qualitative data is also needed.

Contract types consist of cost-plus, fixed-price, and award term. Each offers benefits and drawbacks. Pairing of any type with incentives and metrics allows a flexible means to enhance the efficiency of the program's support requirements. Other types of contractual efforts exist with warranties and teaming arrangements. Numerous warranties exist to meet conditions associated with maintenance and support environments. Teaming provides an efficient manner to both facilitate and retain organic depot capability while allowing the private sector to actively participate in both improvements to the system's support and reductions in total ownership costs.

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V. CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY

The costs to support and maintain weapon systems are increasing every year. Systems are staying in the inventory for longer periods, thus driving the life-cycle costs up at a rate that outpaces the Services' ability to fund them. The research and procurement funding accounts are being used as a means to resource the support efforts. OEMs own the rights to software, and under performance specifications, the Government does not actually buy the technical data packages that would allow broad competition for technically-advanced hardware. In an effort to provide cost efficient maintenance and support for fielded hardware, contracting for life-cycle support is gaining in popularity.

To prevent the erosion of the Government capability within the depot structure, Congress promulgated laws to preclude the arbitrary determination to contract out maintenance-related activities. Mechanisms exist to determine if the depot currently provides the expertise, and if not, mandate that the program office establish the capability. If the capability does exist, and contracting out the effort does not diminish it, conducting a benefit analysis aids in determining the best alternative, both quantitatively and qualitatively. The approach is based upon either a specific or mixture of contract types, with incentives to enhance performance and metrics to measure that performance.

Contract types include firm-fixed price and cost-plus. Incentives can range from incentive to award fees, or mixtures of each. Award Term contracts have gained in popularity within the Air Force due to their ability to provide non-monetary incentives to the contractor. Under an Award Term contract, the performance period can be extended as a performance incentive. Recently, the Air Force has limited the use of Award Term endeavors to Indefinite Delivery/Indefinite Quantity parts contracts. Concerns arose regarding the potential for commitment of funds not yet appropriated by Congress and the ability to extend periods of performance into a category termed multi-year. Multi-year contracts must have Congressional approval prior to award.

Warranties and Teaming arrangements offer other means to contract for support/parts. Warranties exist within contract clauses. The FAR and DFAR provide specific language for use in contractual arrangements. Certain conditions may necessitate specific clauses. The Government must maintain the ability to hold the contractor responsible for latent defects and the ability to request redesign/modifications to correct said defects at no additional cost. Teaming provides both the Government and the private sector with a viable way to establish and maintain a core depot capability while involving the contractor through parts supply and depot engineering support. These Life-Cycle Contractor Support arrangements are encouraged within the Army.

B. RESEARCH QUESTIONS

1. What Various Contracting Opportunities Exist to Provide Life-Cycle Contractor Support (LCCS) for Army Tactical Missile Systems?

Most Army missile systems are considered "wooden rounds," that is, they do not require regularly scheduled maintenance. Recently, the Army is analyzing the costs associated with unscheduled modifications compared to regular maintenance activities to insert reliability improvements. Repair Level Analysis has shown that regular maintenance is worth investigating for the Guided Multiple Launch Rocket System (GMLRS).

The missile launch platforms require maintenance and support. It is one of the major life-cycle cost drivers when assessing spares and repair parts requirements for the ten-to-twenty-year shelf life. The Close Combat Missile System (CCMS) Program Office has received approval from the Department of the Army to enter into contracts for support of both the ITAS and Javelin systems. ITAS has an existing contract for maintenance and supply efforts with the prime developer. Javelin is in the planning stage and envisions a teaming arrangement between the prime and the Government depot. The contract award is to the prime developer who, in turn, contracts with the depot for the maintenance activities. The prime is responsible for the supply of spares and repair parts, facilitization, training, and on-going engineering support of depot efforts.

2. Why Does LCCS Interest the Department of Defense and the Army?

Contracting for performance-based logistics (PBL) allows the contractor to provide a flexible solution regarding a system's performance. Performance-based specifications were implemented to allow flexible development and production for a set of requirements and goals. PBL continues the concept through the support and maintenance of the system.

Another aspect is the manpower reductions attributed to base realignment and closures and an aging workforce. Both tend to drive the Defense Department to third party logistics procurement efforts. The DOD leadership is pushing logistics reform in an attempt to lower the pressure on the Operations and Maintenance Appropriation (OMA). The Navy has used this form of support for years, and leads all of the Services in implementing PBL. The Air Force ranks second, with the Army coming in last. (Shea, 2002)

The Defense Department anticipates that the use of PBL can bring higher levels of system readiness via more efficient management and direct accountability. The 2001 QDR advocated PBL as a means to gain warfighter-focused sustainment of weapon systems. Use of PBL can eliminate non-value-added steps within the supply chain if coupled with modern business systems and appropriate metrics to measure performance.

3. Does the System's Life-Cycle Determine a Specific Contract Method?

The weapon system's program phase demonstrates a relationship between program maturity and risks. While the system's phase in the life-cycle can mandate the type of funds used, it does not necessarily determine a specific contract method. The amount of risk associated with the effort plays a larger role in determining the contract type. Cost-plus contracts place the majority of the risk on the Government by allowing the contractor to incur costs above the negotiated contract price. Negotiating a target and ceiling price distributes the risks more equitably between the Government and contractor, while limiting the Government's liability.

The type of funding also drives the contracting method. Research and Development funding usage occurs when weapon system performance is improved. It also corresponds to a higher risk since the potential outcome cannot be predicted with

certainty. Procurement dollars fund Interim Contractor Support (ICS) efforts occurring prior to organic support capability implementation. The risk during this period is more easily defined and not as high as during a developmental effort. OMA funds typical support and maintenance activities for weapon systems along with the Defense Working Capital Fund (DWCF). OMA funds are fragmented and do not have a single manager, which makes it difficult to resource contractual efforts as large as weapon system support. Because of this, the Army is implementing measures to redirect funding for LCCS activities to program managers.

The DWCF funds the infrastructure associated with supporting systems and once a system enters this domain, it is extremely difficult to remove. Departing the DWCF imposes a re-allotment of costs across the remaining participants that result in increased costs across those associated systems.

4. What Does the Army Contract for in This Environment?

The Army wants a defined package of the logistics support functions required to maintain the readiness and operational capability of a system or subsystem. The package includes materiel management, distribution, technical data management, maintenance, training, cataloging, configuration management, engineering support, repair parts management, failure reporting and analysis, and most importantly, reliability growth. All items must contribute to the warfighter's mission capability. Strategy updates and re-evaluations must occur every five years during the system/subsystem's life-cycle. More frequent updates may occur depending upon the pace of technology. The Defense Department encourages program managers to use organic, commercial, and partnering arrangements to fulfill their support requirements. Teaming is encouraged wherever possible within existing legal constraints.

To measure the performance of the contracted effort, the program manager balances readiness and operational objectives against cost and schedule constraints. Examples of metrics include system availability, logistics footprint, overall system readiness levels, and mission reliability. Linking the metrics to warfighter measures of performance and reporting systems is preferred. It is important to clearly delineate those areas and factors affecting performance that reside outside the contractor's control.

A final area of concern is the use of contractors on the battlefield. The Military Extraterritorial Jurisdiction Act of 2000 augmented the Uniform Code of Military Justice (UCMJ) to cover contractors under conditions other than declared war. The accompanying contracted workforce is now subject to the military legal system and Federal law for criminal conduct and actions occurring outside the United States. (Gutierrez, 2001)

5. What Contractor Incentives Are Possible to Improve Performance?

Incentive and Award fees provide possible means for enhancing contractor performance. Either type promotes operational availability through increased reliability, reduced repair and/or turn-around-times, better distribution times, or any means deemed to be effective. The ITAS contract includes both positive and negative incentives to improve operational availability. Penalties exist for decreased performance in the form of increasing contractor-funded spares and repair parts. The outcome is an increased reliability requiring fewer spares and thus increasing profit.

6. What Legal Ramifications Exist Regarding LCCS?

United States Code: Title 10, Chapter 146 (located at http://uscode.house.gove/title_10.htm) provides extensive guidance and legal constraints associated with LCCS. The Sections and their terminology are:

Section 2460: Definition of depot-level maintenance and repair

Section 2461: Commercial or industrial type functions (required studies and reports before conversion to contractor performance)

Section 2462: Contracting for certain supplies and services required when cost is lower

Section 2463: Collection and retention of cost information data on converted services and functions

Section 2464: Core logistics capabilities

Section 2465: Prohibition on contracts for performance of firefighting or security guard functions

Section 2466: Limitations on the performance of depot-level maintenance of materiel

Section 2467: Cost comparisons (inclusion of retirements costs; consultation with employees; waiver of comparison)

Section 2468: Military installations (authority of base commanders over contracting for commercial activities)

Section 2469: Contracts to perform workloads previously performed by depot-level activities of the Department of Defense (competition requirement)

Section 2469a: Use of competitive procedures in contracting for performance of depot-level maintenance and repair workloads formerly performed at certain military installations

Section 2470: Depot-level activities of the Department of Defense (authority to compete for maintenance and repair workloads of other federal agencies)

Section 2472: Management of depot employees

Section 2473: Procurements from the small arms production industrial base

Section 2474: Centers of Industrial and Technical Excellence (designation; public-private partnerships)

C. RECOMMENDATIONS

The following recommendations are made based upon the analysis of information reviewed for this thesis and the questions/concerns that arose with the ITAS and Javelin ventures. The funding issue concerning both what type and how to resource the effort, is an important impediment to LCCS.

1. The PM Should Be the Focal Point for OMA Funding and Expenditures

Currently, the Operating Tempo (OPTEMPO) provides funding for LCCS activities. OPTEMPO dollars normally go to the organizational units for operational requirements (one of which is equipment support). Since OMA expenditures are not tracked by system, it is difficult, if not impossible, to determine if the units are short-changed by the diversion of these monies from their budget requests. The PM now has the responsibility for defending their system's financial resourcing requests for OMA funds, but the release and expenditure of that money is still not within his purview. Assigning accountability to the PM for expenditures would allow the necessary auditing of those funds by system to determine the actual support costs and associated impacts.

2. An Annual Versus Quarterly Release of LCCS OMA Funding is Needed

Receiving funding on a quarterly basis impedes the contractor's ability to make long-range plans without risk. Contract work stoppages occur when funding is not obligated to a contract at specific time frames. Funding delays could result in contractor lay-offs and loss of support at critical times. Annual funding, coinciding with the Congressional appropriation of resources, greatly reduces the likelihood of adverse impacts.

3. The PM Needs Guidance on Determining the Potential Impact to Depots for the Work Share Loss Relative to LCCS

The PM must prepare a benefit analysis that takes into consideration the loss of depot work share efforts as a part of the quantitative study. The Apache PVS study reaped the benefits of the Inspector General (IG), Army Audit Agency (AAA), and GAO assistance in determining these costs. The PM of medium and smaller programs does not have this advantage and must rely upon comparisons to Apache when developing an estimate. Not all systems are as complex as the Apache system and an analogy to it may

not apply. The PEO, Tactical Missiles has requested the Army Cost and Economic Analysis Center to develop guidelines for PM staffs' use when developing the benefit analysis.

D. AREAS FOR FURTHER RESEARCH

1. Case Study of ITAS or Javelin System

Since both systems have either contracted for life-cycle logistics support, or are in that process, propose case studies of each system for suitability and/or opportunities for improvements relative to other programs.

2. Application of Warranties Within LCCS

Many warranty variations provide a form of life-cycle support for weapon systems. Propose a study on the types and applicability to weapon systems.

3. Government and Contractor Teaming Arrangements

Propose a study regarding Government and contractor teaming arrangements to determine what problems and/or benefits exist when the Government is a sub-vendor.

4. Application of the Military Extraterritorial Jurisdiction Act (MEJA)

Propose a study of the application of the MEJA within the organizational level of support. Study to include the aspects of the Contracting Officer Representative and directing contractor personnel.

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5. Donald R Eaton, RADM (Retired)
   Naval Postgraduate School
   Monterey, California

6. Elizabeth M. Wise
   PEO, Tactical Missiles
   Redstone Arsenal, Alabama

7. COL John Wienzettle
   Close Combat Missile Systems
   Redstone Arsenal, Alabama

8. George C. Collier
   Close Combat Missile Systems
   Redstone Arsenal, Alabama

9. Amy Barnett
   Close Combat Missile Systems
   Redstone Arsenal, Alabama