



Performance Based Logistics (PBL): Overcoming Barriers to Cost Control

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Abstract

During the past 15 years of executing performance-based arrangements, the Department of Defense (DOD) can cite many examples of both program success and failure. Based on the review of years of publications by acquisition professional regarding the PBL initiative, there is widespread consensus that performance metrics (operational availability, operational reliability, cost-per-unit usage, logistics footprint, and logistics response time) effectively influence program improvement in almost every domain. However, the literature suggests that such success is less prevalent in the domain of program cost control. This research explores and examines a body of best practices beginning to form, and a consensus on some avenues for improvement.

The following research will show well-documented barriers that Government Program Managers are overcoming which involve agreements that do not contain proper incentives for contractors to control costs. Such impediments include contracts which: (1) utilize a structure that does not encourage cost control; (2) apply shorter periods of performance which limit contractors' opportunity for return on investments in affordability improvements; (3) do not properly assign asset and process ownership; and (4) apply inconsistent funding streams which de-incentivize the contractor to devote resources towards enhancing process efficiency.

This analysis is a literature review of publications outlining barriers and enablers from past United States DOD PBL agreements. The research identifies aspects of previous and existing PBL agreements that did not work or were inefficient. This research further offers potential solutions towards achieving improved PBL agreement performance for attaining the higher goals of enabling the best-performing systems for the Warfighter and the best value for the taxpayer.

Introduction

Background

According to the 2005 version of the Defense Acquisition University publication

Performance Based Logistics: A Program Manager's Product Support Guide:

PBL is the preferred Department of Defense (DOD) product support strategy to improve weapons system readiness by procuring performance, which capitalizes on integrated logistics chains and public/private partnerships. The cornerstone of PBL is the purchase of weapons system sustainment as an affordable, integrated package based on output measures such as weapons system availability, rather than input measures, such as parts and technical services. (Defense Acquisition University, 2005, p. vii)

The PBL Guidebook (2005) asserts the top strategy for sustaining DOD weapon systems is a performance-based approach. Defense acquisition organizations improved steadily in their execution of PBL over the past 15 years; however, room for improvement still exists. For successful execution of PBL programs, the objective remains: “to provide life cycle product support that delivers needed reliability and availability at a reduced cost while complying with directives and maximizing the use of existing Government-owned inventory when purchasing through a PBL” (U.S. Department of Defense, 2016, p. 10). Further, PBL strives to ensure Government agencies properly define performance quality levels. The initiative seeks to make certain that support providers receive their compensation based upon the degree to which the product meets prescribed standards (U.S. Department of Defense, 2016).

Problem Statement/Research Question

Given the ever-increasing level of threats to the United States, it is imperative that the DOD strive for continuous improvement. DOD acquisition professionals and Government oversight organizations can cite many examples of both program success and failure. This research finds and presents a body of best practices beginning to form, and a consensus among

acquisition professionals on some avenues for improvement. This research examines the question, “How can the DOD tailor Acquisition strategies to overcome the documented barriers to the successful execution of PBL programs?”

The following research will show well-documented barriers that Government Program Managers are overcoming which involve agreements that do not contain proper incentives for contractors to control costs. Such impediments include contracts which: (1) utilize a structure that does not encourage cost control; (2) apply shorter periods of performance which limit contractors’ opportunity for return on investments in affordability improvements; (3) do not properly assign asset and process ownership; and (4) apply inconsistent funding streams which de-incentivize the contractor to devote resources towards enhancing process efficiency.

Purpose of the Research

This is a study of best practices recommended and implemented by Acquisition professionals and U.S. Government Agencies, which provide the most positive results for successful execution of PBL programs.

A key aspect of any performance-based contract is the identification of the metrics against which the Government will assess contractor performance. The PBL Top-Level Metric Objectives as defined in Under Secretary of Defense for Acquisition, Technology and Logistics (USD (AT&L)) Memorandum, August 16, 2004, Performance Based Logistics: Purchasing Using Performance Based Criteria are:

1. Operational Availability, which is a measure of the percent of time a system is available for mission employment or the ability to sustain operations tempo
2. Operational Reliability, which is the measure of a system in meeting mission success objectives (percent of objectives met, by system). Depending on the system, a mission objective could be a sortie, tour, launch, destination

- reached, or other service- and system-specific metric
3. Cost per Unit Usage, which is a measure of the total operating cost divided by the appropriate unit of measurement for a given system. Depending on the system, the measurement unit could be flight hour, streaming hour, launch, mile driven, or other service- and system-specific metric
 4. Logistics Footprint, which is a measure of the Government/contractor size or presence of deployed logistics support required to deploy, sustain, and move a system. Measurable elements include inventory/equipment, personnel, facilities, transportation assets, and real estate
 5. Logistics Response Time, which is a measure of the period from logistics demand signal, to satisfaction of that logistics demand. 'Logistics demand' refers to systems, components, or resources (including labor) required for system logistics support

(Defense Acquisition University, 2005, pp. 2-5-2-6)

According to a review of acquisition literature, there is widespread consensus among acquisition professionals that these performance metrics effectively influence program improvement in almost every circumstance under the PBL initiative. To explore further areas for improvement, this research will consider an expanded and more holistic viewpoint, which includes program cost and effective management practices.

Significance

In the context of continuous improvement, this research will seek to help the reader understand the most significant lessons learned from DOD PBL programs. This study will explore what the historically documented barriers have been to successful PBL execution, and which Acquisition strategies are effectively overcoming these barriers. This understanding will facilitate replication of such practices to better position DOD programs to increase performance as well as deliver to the Warfighter the right capability at the right time, and within acceptable funding constraints.

Literature Review

The literature supporting this research focuses on PBL barriers and best practices. It includes perspectives from as early as 2001 which the DOD advanced as part of its Quadrennial Defense Review (QDR). The research includes a sampling of publications from the U.S. DOD and the Defense Acquisition University; articles from the *Defense Acquisition Review Journal* and from *Defense AT&L*; reports from the U.S. Government Accountability Office and the U.S. DOD Inspector General; and research papers from the U.S. Army War College, the U.S. Air Force Institute of Technology, the U.S. Army Command and General Staff College, and the U.S. Naval Post Graduate School. The collection of publications reviewed is a study in lessons learned in the U.S. DOD from past performance-based arrangements. The research identifies aspects of previous and existing PBL agreements that did not work or were inefficient. This research further offers potential solutions towards achieving improved PBL agreement performance for attaining the higher goals of enabling the best-performing systems for the Warfighter and the best value for the taxpayer.

Performance Based Logistics: A Program Manager's Product Support Guide

The *Program Manager's Product Support Guide* is a 2005 publication by the Defense Acquisition University, presenting guidance derived from the lessons learned via the execution of PBL arrangements throughout the Armed Services. It defines PBL as “the preferred Department of Defense (DOD) product support strategy to improve weapons system readiness by procuring performance, which capitalizes on integrated logistics chains and public/private partnerships” (Defense Acquisition University, 2005, p. vii). PBL provides product support through the sustainment of weapons systems, measured by predetermined output metrics such as operational availability and logistics response time.

This approach replaces the conventional input metrics such as labor touch-time and parts usage (Defense Acquisition University, 2005).

PBL Guidebook: A Guide to Developing Performance-Based Arrangements

The *PBL Guidebook* is a 2016 publication by the U.S. Department of Defense intended to provide support to a Program Management Team charged with developing and executing PBL arrangements. It outlines several tenets, which consistently drive optimal outcomes. The guidebook asserts that the Government should provide sustainment contractor firms significant incentives through contract types, contract length, and incentive fees; specifically, incentives which allow for extensions to contract duration that will provide stability to the service or product provider (U.S. Department of Defense, 2016).

The *PBL Guidebook* states that the DOD prefers Firm Fixed Price (FFP)-type contracts because they transfer financial risk from the Government to the supplier and thus provide powerful incentives for those companies to improve their reliability and efficiency in order to reduce their costs. Additionally the arrangement should provide sufficient contract length in order for the provider to be able to recoup their investments into these improvements (U.S. Department of Defense, 2016).

It is important that both the Government and the provider have extensive experience and knowledge in performance-based concepts, business models, and techniques for implementation. It is important that this expertise be in place early in the program, so that all parties understand the intent of performance-based arrangements and have the tools to execute them effectively. Ultimately, by transferring risk to the contractor, and providing incentives that foster program effectiveness, the Government enables the contractor to take

appropriate risk in the execution of its own core competencies and thus removes risk from the total system (U.S. Department of Defense, 2016).

The Future of Integrated Supply Chain Management Utilizing Performance Based

Logistics

This *Defense Acquisition Review Journal* article by Navy Lieutenant Commander Wes Griffin (2002) reviews efforts to modernize logistics, through a focus on PBL strategies to provide improved support to the Warfighter. Griffin (2002) outlines the case study in which the Naval Inventory Control Point awarded a contract to Raytheon for the maritime Phalanx Close in Weapons System, under which the contractor assumed responsibility of central procurement, management, and supply support, and by which the employment of metrics such as Material Availability and Mean Logistics Delay Time experienced significant improvement.

Performance-Based Logistics—Barriers and Enablers to Effective Implementation

This December 2004-March 2005 *Defense Acquisition Review Journal* article by Dr. Hank J. Devries (2004 – 2005) reviews key barriers and key enablers to effective PBL implementation. Devries' (2004 – 2005) research showed that the most frequently encountered barrier was funding restrictions and inflexibility. The Government should continue and reinforce some already implemented improvement endeavors by policy and training efforts. These include replacing the Planning, Programming, and Budgeting System (PPBS) with the Planning, Programming, Budgeting, and Execution System (PPBES), and the focus on Performance-Based Acquisition training at the Defense Acquisition University.

Dr. Devries' (2004 – 2005) research concludes that four areas need to be of focus at the program office level:

1. Logisticians must work closely with the program manager and other acquisition disciplines to address performance issues and ensure that the Government links metrics closely with Warfighter outcomes.
2. Contracting officers need to work closely with logisticians when drafting the contracting strategy and building incentives into contracts.
3. Financial managers and logisticians need to jointly develop life cycle cost estimates and come up with innovative approaches within the funding constraints and statutory guidelines to reduce total ownership cost.
4. Logisticians need to develop objective business case analyses to support smart decisions on the right mix of support providers to optimize Warfighter performance outcomes (p. 252).

Performance Based Logistics: Optimizing Total System Availability and Reducing

Program Cost

In this 2011 report, US Army War College student, Lieutenant Colonel (LTC) David M. Kaczmariski outlines impacts of acquisition strategies and implications of funding streams. Kaczmariski (2011) notes that, when a provider executes the arrangement at both the subsystem and component level, the provider benefits from program integration as a core competency and are thus able to reduce costs through volume discounts.

Kaczmariski (2011) notes that, under the federal budgetary process and acquisition regulations, the U.S. Congress constrains funding by both purpose and time. Such limitations are inflexible and do not allow for optimal achievement of economies of scale or full profit realization. Additionally, defense industry professionals advocate for longer contract performance periods—ideally five to ten years—that would allow program managers long-term efficiencies and reduced risk. Another complication is funding derived from multiple appropriations. When the U.S. Congress fragments and constrains funding, contractors may choose to use Contractor Funded Requirements (CFR) or “at-risk” purchases to meet their objectives, and anticipate that the Government will ultimately reimburse them.

When such purchases are not on contract or backed by an appropriation, the Government has no right to inspection, has no means to seek corrective action, and may pay a higher price due to the contractor working outside the Business Case Analysis (BCA) (Kaczmariski, 2011).

Performance Based Logistics – A Bridge between Acquisition Reform and Logistics Supply Chain Management

In a 2011 research paper, U.S. Army War College student, Colonel Dana Hurst explores the use of a Lead System Integrator. Under this approach, the provider acts as a general contractor for integration of resources, programmatic factors, systems engineering, testing, and subcontract operations. The approach intends to optimize performance, ensure interoperability, and maintain commonality in order to reduce life cycle costs in an environment where, otherwise, sub-programs would be competing for the same resources.

The purpose is to achieve a single point of accountability for sustainment stocks, delivering maximum combat power and a minimum logistics footprint. Another advantage seen is that the suppliers will be incentivized to increase system and component reliabilities, as opposed to generating profits through the sale of expensive repair parts (Hurst, 2006).

Balancing Government Risks with Contractor Incentives in Performance-Based Logistics

Contracts

In a 2008 research paper, U.S. Air Force Captain (CPT) Christopher P. Gardner studies how DOD can use PBL contracts to reduce operational and financial risks while encouraging investments in performance by providers. Gardner finds that if the arrangements more frequently included provisions for profit sharing between Government and the provider, that both parties realize maximum benefits. Additionally, when combined with a contract that incentivizes the contractor through the sharing of profits, an agreement of a long-term nature

initiates contractor investment in logistics support for systems, enabling cost and performance improvements (Garnder, 2008).

Improved Analysis and Cost Data Needed to Evaluate the Cost-effectiveness of Performance Based Logistics

The 2008 Government Accountability Office (GAO) report reviews characteristics of PBL arrangements that may prove to constrain capacity to reduce costs. One such limitation is contract length. A key tenet of PBL arrangements is that the ability to incentivize the provider to reduce costs through increased performance while making a profit and the contract length should allow adequate time to provide a return on the investment made in this performance improvement. There are documented instances in which contractors invested in improvements that the company realized during the contract period and passed on the costs of those outside of the contract period to the Government. Another constraint is unstable funding. The assurance of long-term revenue should be in place to allow contractors to make business decisions such as performance improvements and long-term arrangements with suppliers. In addition, when funding is uncertain, this further exacerbates the impact of short-term contracts. (U.S. Government Accountability Office, 2008)

The GAO (2008) report also notes the impact of the asset ownership structure. With greater ownership, the provider is more likely to invest more in performance and spend less in maintaining inventory levels since the provider does not incur inventory-holding costs. Further, the GAO (2008) found that many PBL arrangements did not include cost as a performance metric and provided no incentive to reduce costs. In those instances when the Government and contractor negotiated cost in the support agreement, the partners were able to share annual savings when actual costs came in lower than negotiated.

DOD Press Briefing on Better Buying Power 3.0

In a 2015 press briefing presented by Deputy Secretary of Defense (DEPSECDEF) the Honorable Bob Work and USD (AT&L) the Honorable Frank Kendall III, these officials outlined the history of the Better Buying Power initiatives. According to DEPSECDEF Work:

So whereas Better Buying Power 1.0 and 2.0 focused on reforming our acquisition processes and making them more efficient, Better Buying Power 3.0 is primarily about providing dominant capabilities to the warfighter to try to maintain that technological overmatch that we've always enjoyed and, if anything, to try to extend it if at all possible. (U.S. Department of Defense, 2015, p. 3)

USD (AT&L) Frank Kendall reviewed a new initiative aimed at removing bureaucracy where it affects industry, stating, "Katrina McFarland, the Assistant Secretary for Acquisition, has been working with industry for some time now to find ways in which we could remove some of the bureaucratic burdens that we place on industry" (U.S. Department of Defense, 2015, p. 10).

Performance Based Logistics and Project Proof Point: A Study of PBL Effectiveness

The Principal Deputy Assistant Secretary of Defense for Logistics and Materiel Readiness (LM&R) chartered this study in September 2010 to assess PBL product support strategies. Some notable findings include:

1. Well-crafted PBL arrangements manufacture competition by incentivizing companies to compete against internal waste and quality challenges in order to drive up quality (thereby reducing demand) while simultaneously driving down process, labor, and material costs.
2. The Government links PBL provider behavior directly to the incentives embedded in the arrangement; the military Services set the contractual arrangements.

3. Longer-term contracts that provide assured revenue streams and contain well-crafted cost and performance incentives drive predictably positive outcomes for the Services.

(Boyce & Banghart, 2012, p. 29)

The study concluded, “PBL arrangements which substantially adhere to generally recognized PBL tenets reduce DOD cost per unit of performance while simultaneously driving up the absolute levels of system, sub-system, and major component readiness/availability when compared to non-PBL arrangements” (Boyce & Banghart, 2012, p. 30).

Better Cost-Control Measures Are Needed on the Army's Cost-Reimbursable Services

Contract for Logistics Support of Stryker Vehicles

This 2012 Inspector General report assessed the effectiveness of the contractor logistics support strategy for the Stryker family of vehicles. The study found three primary deficiencies in the performance-based arrangement. The Program Management Office (PMO) did not:

1. Adequately define performance-based contract requirements in clear, specific, and objective terms with measurable outcomes
2. Establish the cost-reimbursable contract as one of the basic contract forms
3. Establish an effective means to measure operational costs and ensure that the level of operational funding was tied to the actual workload required to sustain the Stryker vehicle

(Inspector General United States Department of Defense, 2012, p. i).

Additionally, regarding proper incentives, the study found that the PBL arrangement’s “sole focus on operational readiness created an incentive for the contractor to spend all available funds on Army inventory, valued by General Dynamics at about \$676.2 million, resulting in little, if any, cost risk for the contractor or incentive to control cost” (Inspector General United States Department of Defense, 2012).

Performance-Based Logistics: Making the Military More Efficient

Baker Spring (2010), national security policy expert, asserts that there is a political bias against private contractors that will undermine public-private partnerships and inhibit PBL arrangements from achieving the desired outcomes. Spring (2010) stresses that defense contractors are not the parasites that Congress perceives them to be—that the Government should reward them for providing top-quality, affordable goods and services. Spring (2010) concludes that, to combat this anti-contractor bias, Congress must hold hearings to inform Members of the logistical partnerships and process, and to help them understand the barriers that are preventing success under performance-based arrangements.

Performance-Based Life Cycle Product Support Strategies: Enablers for More Effective Government Participation

This October 2010 Defense Acquisition Review Journal publication authored by Geary, Koster, Randall, & Haynie outlines four case studies that demonstrate that Government organizations can successfully compete and perform performance-based arrangements as support provider. Even so, Government “cannot do all of DOD’s product support work. American industry provides a source of innovation, and flexible and productive capacity for the defense industrial base. The way ahead for more cost-effective product support lies in effective blending of these complementary capability sets where the best use is made of the entire industrial base, facilitated by the continuing expansion of best business practices in both the commercial and Government sectors” (Geary, Koster, Randall, & Haynie, 2010, p. 454).

The Under Secretary of Defense Memo: Product Support Boundaries

This 2004 DOD document provides a strategic template for innovative sustainment and delivers recommended sustainment approaches to Program Managers (PMs) and their staffs.

In regards to resource management, the publication offers four guiding principles:

1. **Funding:** Force providers need to ensure that funding is in place to provide in-service support. PMs will negotiate performance-based agreements using a range of funding/performance alternatives. Once the DOD allocates funding, the PM will use it to buy a level of performance.
2. **Support Provider Agreement:** When negotiating support provider performance-based agreements, PMs will include a range of cost-estimated performance levels to ensure rapid adjustment to funded support level in the execution year. PMs will execute support provider agreements using the actual funded level provided by the force provider.
3. **Accounting:** The PM will implement procedures and ensure systems are in place to provide accurate accounting and performance information.
4. **Financial Requirement for Contractor Logistic Support:** PMs must comply with the financial propriety associated with developing and implementing contracted arrangements. (Wynne M. J., 2004, p. 19)

Best Practices: Better Support of Weapon System Program Managers Needed to Improve

Outcomes

The 2005 GAO report reviews the differences in support for industry vs. Government PMs, Specifically, finding the differences in incentives to be problematic. The study found that commercial firms, whose success depended on an ability to increase market share, developed the highest quality products at the lowest possible prices. Moreover, that, in pursuit of this goal the firm must place great focus on the efficient utilization of resources. In contrast, the study found that, in practice, Government PMs define success by the program's ability to gain support and obtain funding. Furthermore, there is an incentive for PMs to suppress bad news so as not to lose support and funding and cause further damage to the program (U.S. Government Accountability Office, 2006).

Designing and Assessing Supportability in DOD Weapon Systems: A Guide to Increased Reliability and Reduced Logistics Footprint

This 2003 guide prepared by the Office of Secretary of Defense provides a model for PMs to define and evaluate their program activities. “Emphasis is placed on designing for increased reliability and reduced logistics footprint and on providing for effective product support through performance-based logistics strategies” (U.S. Department of Defense, Office of Secretary of Defense, 2003, p. 3).

Performance-Based Logistics

LTC Bobby L. Claiborne (2004) describes the implementation of PBL and assesses the initiative’s capability to improve and sustain system readiness. Among the benefits of PBL arrangements, LTC Claiborne (2004) finds that the use of contracted integrated technical information systems can reduce Government expense, and that implementing long term contracts often reduces costs through less administrative time. LTC Claiborne (2004) observes many challenges that the DOD must address and overcome. One notable challenge is that increased reliance on contractors for logistics support could affect weapon systems’ readiness during deployments (Claiborne, 2004).

Performance-Based Logistics, Contractor Logistics Support, and Stryker

Major (MAJ) Brent D. Coryell (2007) uses a case study approach to examine the reasons the Army decided to transfer the Stryker from Contractor Logistics Support (CLS) to organic sustainment support. Major (MAJ) Brent D. Coryell (2007) found a key barrier to the effectiveness of the CLS PBL arrangement due to funding limitations. PBL arrangements typically use multiple funding sources with varying expiration dates and a flow of funds through multiple commands. MAJ Coryell (2007) asserts that such existing financial

constraints and processes support functional stovepipes and inhibit efficient utilization of resources. Among other solutions, MAJ Coryell (2007) recommends that DOD “make the case to Congress to use multi-year contracting (three to five years or more) in order to enable the contractor to reduce investment risk, maximize efficiencies, and efficiently manage the obsolescence of parts being issued” (p. 90).

Research Methodology

Overview/Research Purpose

There is a plethora of published material pertaining to PBL support arrangements. Many program office professionals, Government agencies, and scholars wrote hundreds of articles and research papers outlining PBL implementation and lessons learned in the context of Acquisition reform. The objective of much analysis is to achieve the best support to the Warfighter at the best value to the taxpayer. The intent of this research is to analyze and compile those practices identified most often as barriers to successful execution of PBL arrangements, and recognize potential mitigations to such impediments. The objective of the research is to enable future programs to implement these improvements going forward, and enhance the buying power of the Department of Defense.

Literature Review

The literature review focuses on sources that provide evidence, through analysis or anecdotes, of barriers to effective execution of PBL agreements. Identifying the most prevalently reported of those barriers over the last fifteen years of PBL execution in DOD and best practices that have mitigated or overcome those barriers. The body of work reviewed includes publications from the U.S. DOD and the Defense Acquisition University; articles from the Defense Acquisition Review Journal and from Defense AT&L; reports from the U.S.

Government Accountability Office and the U.S. DOD Inspector General; and research papers from the U.S. Army War College, the U.S. Air Force Institute of Technology, the U.S. Army Command and General Staff College, and the U.S. Naval Post Graduate School.

Limitations

The lack of standardized cost data limits the ability to present a quantifiable analysis of the cost impact of the barriers mentioned. A December 2008 GAO report found that the impact of PBL on reducing sustainment costs is unclear. “The extent to which PBL arrangements are reducing costs for weapon system support is unclear and generally remains undocumented even after several years of PBL implementation. A major difficulty in assessing the cost impact of PBL arrangements is the lack of detailed and standardized cost data maintained by the program offices” (U.S. Government Accountability Office, 2008, p. 31). Consequently, this study focuses on anecdotal evidence and Government oversight findings on the characteristics of PBL arrangements that promote the incentive to control costs.

An additional constraint in this analysis was the period of time available for research. The completion suspense for this project was ten months, which reduced the amount of in-depth analysis possible. The time constraint also prevented the use of human subjects due to lengthy vetting requirements.

Data Analysis and Findings

This research finds that a primary category of barriers to successful execution of PBL agreements is the lack of provisions to control costs. This study draws upon dozens of DOD publications, Government agency reports, scholarly papers, and journal articles, and has found that a predominance of the evidence points to four areas of opportunity to better control costs in PBL contracts. These areas of focus require the Government to incentivize properly the service

provider to control costs through proper contract type, contract length, asset and process ownership, and consistent funding. According to research by Boyce and Banghart (2012), overcoming these barriers would manufacture competition—motivating companies to “compete against internal waste and quality challenges in order to drive up quality while simultaneously driving down process, labor, and material costs” (p. 29).

Contract Type

In acquisition strategy development of PBL arrangements, the type of contract vehicle selected greatly influences the contractor’s incentive to control costs. According to United States Air Force CPT Christopher P. Gardner (2008):

If PBL contracts more frequently included provisions for profit sharing between DOD and private vendors, benefits may be realized by both parties. Because profit sharing benefits everyone and is conceptually well suited to the “win-win” partnerships that PBL agreements claim to be, it would seem that financial returns on improvements should be shared whenever feasible”(p.78).

In a 2008 report to the Subcommittee on Readiness, Committee on Armed Services, House of Representatives, the U.S. Government Accountability Office (GAO) studied characteristics of DOD’s PBL arrangements and limitations on the potential to reduce support costs. The GAO found that, of the aviation PBL arrangements they reviewed, few (notably the F-117 and Shadow Tactical Unmanned Aircraft System) contained a provision for the Government and support provider to share any cost savings that the contractor may be able to generate (U.S. Government Accountability Office, 2008).

To capitalize on the intent of the PBL initiative and achieve the most cost efficient weapon system outcomes, it is imperative that the Government structure its PBL contracts to facilitate investment recovery for support providers who invest in process improvements. As

displayed in Figure 1, with traditional contracts, industry earns a fixed profit while the total cost to the Government increases over time. Contrarily, Performance-Based contracts, through allowing for shared profits, incentivize industry investments in reliability or service improvements, and allow for larger profits for the support provider, and a lower total cost for the Government.

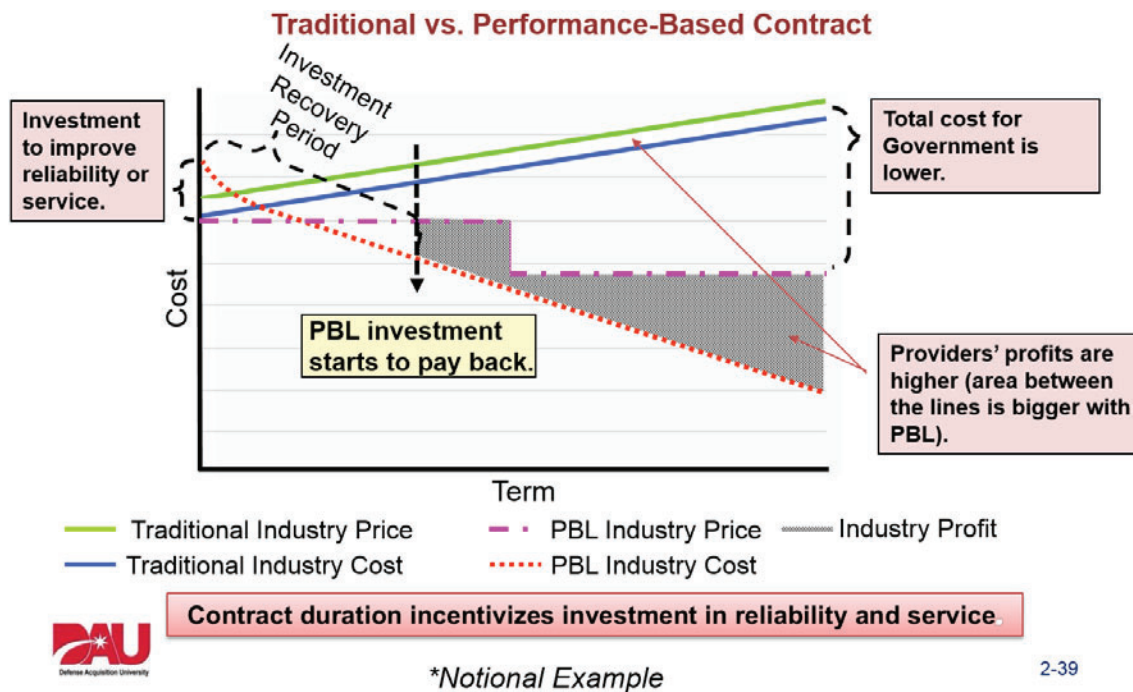


Figure 1. Traditional vs. Performance-Based Contract

(Defense Acquisition University, 2016)

It is important that our PBL arrangements appropriately compensate contractors and motivate them to exceed the terms of the contract when the Government is willing to pay for such achievements. Such incentives allow corporations to create investments in performance, process, and cost improvements, such as long-term contracts with suppliers, which when profits are shared, translate to success for both the customer and provider (Kaczmariski, 2011).

According to the Department of Defense's 2016 Performance Based Logistics Guidebook, the Government prefers firm-fixed price and fixed price incentive contracts because they effectively incentivize the service provider to improve processes in order to reduce costs. Even so, there have been many effective PBL arrangements structured with the Cost Plus Incentive Fee (CPIF) variant. CPIF contracts may be most effective when cost and risk are difficult to determine, or when the cost to transfer risk to the Government is high (U.S. Department of Defense, 2016).

As CPT Gardner (2008) reported, Fixed Price contracts are advantageous in that they “stabilize prices for the Government while guaranteeing a specific level of revenue for vendors” (p.80). Through firm-fixed price and fixed price incentive contracts, providers have an incentive to improve not only performance, but also processes and cost because the monetary savings translate to profit for the company. According to the Defense Acquisition University's 2017 course on Performance Based Logistics firm-fixed price and fixed price incentive contracts provide strong incentive for the contractor to control costs. However, firm-fixed price contracts, which offer no incentives, “do not share these savings with the Government, and without additional mechanisms (e.g., Contract Data Requirements Lists), they do not provide the information needed by the Government to understand actual costs for negotiations on future PBL contracts” (Defense Acquisition University, 2017).

As shown in Figure 2, there is a spectrum of contract types that allow either the Government or the contractor to incur the entire cost risk, or allow any balance in between. In a firm-fixed price arrangement, the contractor bears the risk because the contractor has agreed to provide the service at a pre-negotiated price, and if the contractor is unable to do so, the contractor must cover any additional expenses to provide the agreed-upon support. On the other

end of the spectrum, cost-plus-fixed-fee contracts transfer total cost risk to the Government because, in such agreement, the Government has agreed to cover 100% of the contractor's allowable costs plus a pre-determined fee amount. If the contractor's costs are allowable, allocable, and reasonable, and much higher than anticipated, the Government must cover that cost. In between those contract types are more-balanced arrangements that share risk and share profits.

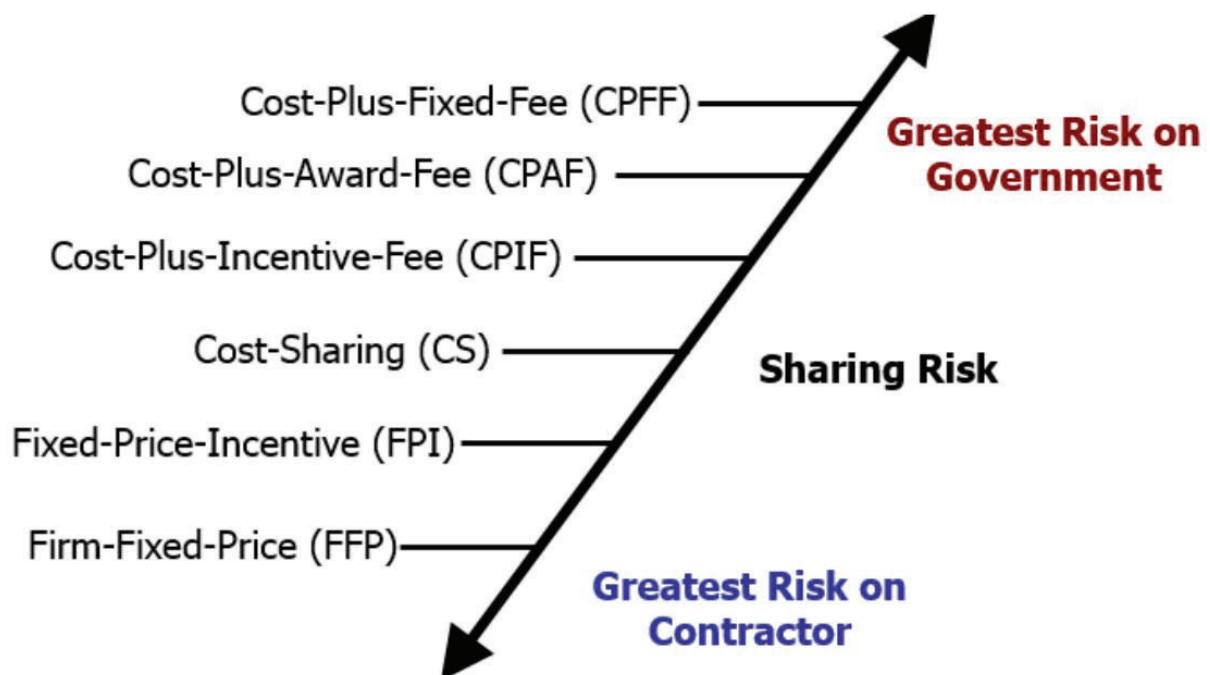


Figure 2. Contract Risk

(Dixon Hughes Goodman, LLP, 2015)

The DOD PBL Guidebook further states that:

Uncertainty and risk are used to determine the appropriate contract type while contract structure ensures alignment of the interest of the Government and industry. The key to an effective PBL arrangement is using incentives to elicit the desired behavior/outcome from the Product Support Provider/Product Support Integrator (PSI/PSP) in spite of the guaranteed cost reimbursement (U.S. Department of Defense, 2016).

The contractor will invest in innovation, lean processes, and automation to control costs if the contracted agreement allows the contractor to increase its profitability by doing so (U.S. Department of Defense, 2016).

In mature programs where requirements are well defined and cost certainty mitigates the risk to the contractor, the Government can benefit from offering Fixed Price Incentive Fee (FPIF) contracts. In less mature programs, an agreement with appropriate risk begins as Cost Plus Incentive Fee (CPIF) contracts to establish a baseline; subsequent contracts are Fixed Price Incentive Firm arrangements once the Government better understands the requirements and their costs. In both types of contracts, the Government and Contractor share the consequences of cost overruns and the additional cost of overruns based on a contractually established share ratio. Developing and maintaining a BCA with a risk analysis will determine whether a fixed price or a cost plus contract provides the greater overall outcome for each contract period.

While these cost control incentives and shared savings are effective mechanisms to decrease total program cost, another key consideration is the length of the contract, and the recoupment that the contract length allows of contractor cost-control investments.

Contract Length

In acquisition strategy development of PBL arrangements, the length of the contract period of performance selected greatly affects the contractor's incentive to control costs. In the 2016 Performance Based Logistics Guidebook, the DOD outlines ten tenets of PBL agreements that drive optimal outcomes. Of those, Tenet #5 asserts that these agreements must provide adequate contract length so that the contractor may recoup any investments in improved product and sustainment processes (U.S. Department of Defense, 2016).

In a 2008 report to the Subcommittee on Readiness, Committee on Armed Services, House of Representatives, the GAO found instances where support providers were hesitant to institute needed reliability improvements while under contracts which were one-year in length—citing lack of ability to regain from such investments in the short term. The Joint Primary Air Training System Program illustrates one example. Program Office officials reported that during the annual PBL support contract, the contractor did not make any investments to improve unreliable components.

Although officials were expecting the fixed-price performance contract to motivate the contractor to invest in improvements to increase reliability and maximize profit, they found that the contractor minimized its own costs during the contract period and passed on the costs to improve the reliability of components with high failures to the Government when the contract was renegotiated (U.S. Government Accountability Office, 2008, p. 42).

CPT Gardner's (2008) analysis regarding balancing Government risks with contractor incentives found that long-term agreements are key to PBL strategies that effectively control costs. Gardner (2008) found a consensus that "long-term" in this context refers to contracts of periods of five or more years. There is mounting agreement that these enduring agreements provide many benefits such as:

1. The long-term nature of the agreement strengthens the partnership between DOD and private industry.
2. When combined with the right contract type, there is more incentive for contractors to invest in logistics support for systems, enabling affordability improvements.
3. Contractors see opportunity for greater return on investment.
4. The Government does not expend labor to rewrite continually the contract from year to year

(Garnder, 2008, p. 79)

When creating acquisition strategies for PBL contracts, utilizing long-term contracts (5-10 years) provides sufficient time for the support provider to maximize efficiencies—to share

with the Government through incentive-type contracts. Longer contract periods allow the contractor to level-set staffing and capacity requirements. Support providers can develop a well-trained workforce and dedicate floor-space and tooling given adequate time to recoup the investment in such assets. A support provider is more likely to make a capital investment to gain efficiencies if, after the break-even point, there is a significant period of profitability and a higher return on investment. Some of these investments can be key to the tenants of PBL such as modeling and simulation systems to validate processes and predict readiness rates. Additionally, longer-term agreements allow the support provider to enter into partnerships with its vendors to achieve greater volume discounts, and to pass those savings along to the Government.

Investments in assets and processes can create great savings for both the contractor and the Government. The level of asset and process ownership that the Government allows the contractor in the PBL arrangement often limits the contractor's ability to make such investments.

Asset and Process Ownership

When the Government allows the contractor high levels of control of assets and processes in execution of weapons system sustainment, the Government creates the ability for contractors to invest in efficiencies and to share those savings with the Government. In the 2008 report to the Subcommittee on Readiness, Committee on Armed Services, House of Representatives, the GAO found that many of the PBL arrangements utilized the support provider for inventory management, but did not transfer ownership to them. The asset ownership structure is a significant driver of efficiency in PBL agreements, with higher ownership by the provider requiring less spending to maintain inventory levels. This lower inventory holding expense allows the contractor to invest more in reliability improvements.

Under an arrangement in which the contractor owns and manages the inventory, reliability improvements, and inventory costs will both be evaluated in terms of their ability to meet performance metrics and minimize costs. If the PBL arrangement only includes inventory management, higher inventory levels may be used, instead of investments to improve reliability, to meet performance metrics—particularly those that measure availability—since inventory holding costs are not incurred by the contractor. Consequently, under DOD’s PBL arrangement contractors may choose to make fewer reliability improvements (U.S. Government Accountability Office, 2008).

Evidence collected by the GAO (2008) suggests that more-effective PBL acquisition strategies allow the support provider a high level of inventory and process ownership. If the requirement is mature and the scope is well defined, the contractor can invest in capital and processes that provide cost savings for the program. The contractor can purchase assets to utilize them on multiple programs, and spread those investments and inventory holding costs amongst multiple customers, reducing the burden on the Government program manager. Additionally, intellectual capital is the heart and soul of the industrial base. When contractors have high ownership in its assets and processes, the contractors have the ability and incentive to develop intellectual property. This ability to control intellectual property motivates the contractor to bid on sustainment efforts because such intellectual property can create a market niche and profitability across multiple customers and efforts. Additionally, the ability to invest in this intellectual property through a contract that allows high ownership entices multiple bidders and can lower costs to the Government through acquisition competition.

While provisions for proper contract type, contract length, and asset and process ownership structures provide incentives for cost control, none of these enablers is effective without consistent cash flow.

Inconsistencies in Funding

In the execution of PBL arrangements, the Government often provides the contractor with funding that is either fragmented (only usable for a certain purpose or time period), or that is unpredictable in its cash-flow schedule. Such inconsistencies often cripple the support provider, bog the provider down in bureaucracy, and prevent the provider from executing all of the aforementioned enablers of cost control.

Dr. Hank J. Devries (2005) surveyed 26 DOD acquisition programs exploring barriers and enablers to effective PBL implementation. As displayed in Figure 3, his findings were that 17 of those programs identified funding as a barrier—making funding the most frequently encountered barrier in his research. The responses from those affected programs outlined experiencing such funding restrictions as fiscal limitations in terms of purpose and expiration, as well as inadequate Program Manager control over Operations and Maintenance funding. Also identified in Figure 3 were lesser-found barriers of statutes and regulations, culture, infrastructure, data rights, training, and depot incentives (Devries, 2005).

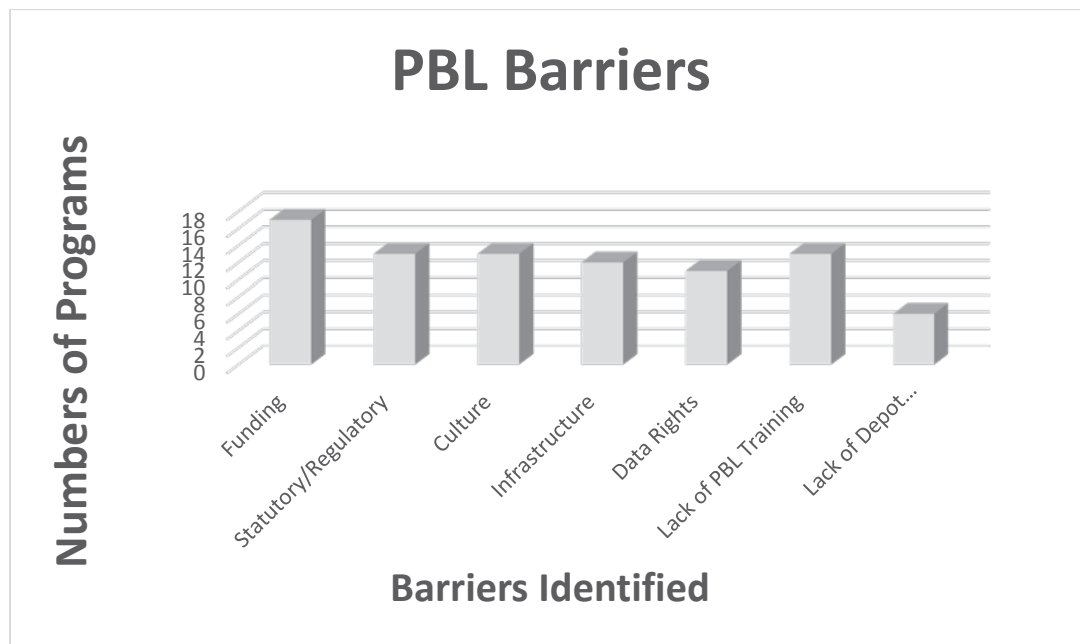


Figure 3. PBL Barriers

(Devries, 2005)

According to the Defense Acquisition University's continuous learning module on Performance Based Logistics (CLL011):

PBL programs may be financed with either appropriated or Working Capital Funds. During System Acquisition, PBL may be funded with Procurement and (depending on scope of support) Research, Development, Test, & Evaluation (RDT&E) funds. After fielding, Operations and Maintenance funds are the predominant source of funding for system sustainment, although there is increasing use of working capital funds in PBL product support strategies (Defense Acquisition University, 2017).

The Navy has been very successful in implementing the use of its Working Capital fund as a key enabler of PBL product support strategies. Working Capital Funds allow for contracts with performance periods spanning multiple years. Such allowances make use of congressionally granted authority in use of multiyear contracts (Defense Acquisition University, 2017).

In instances where Operations and Maintenance (O&M) funding is used, there is widespread agreement that the use of a single line of accounting, rather than multiple program elements, within the O&M appropriation is key in maximizing flexibility in meeting performance goals. This practice also allows for streamlined tracking and base lining of sustainment costs (Defense Acquisition University, 2017).

An interesting development in this regard is, in a 2007 study of PBL financial integration challenges, MAJ Brent D. Coryell reviews a pilot program instituted in 2004 by Deputy Under Secretary of Defense (LM&R), Under Secretary of Defense (Comptroller), and the Director, Program Analysis and Evaluation (D,PA&E) called Management Initiative Decision (MID) 917. This initiative included significant policy provisions intended to enhance the PM's capability in overseeing PBL support funding.

The Military Departments (MILDEPS) shall realign PBL resources from functional Program Elements into the Program Element that finances the system the PBL agreement supports. The MILDEPS shall identify single lines of accounting in their O&M appropriations for financing O&M requirements for the pilot PBL programs and shall consolidate and realign O&M PBL program resources into these single lines in each applicable O&M appropriation (Coryell, 2007, p. 65).

Other than a mid-program progress report to the Total Life Cycle Systems Management Executive Council in 2005 stating favorable results for some programs, there seems to be no evidence that the financial policy exists beyond the pilot program (Kratz, 2005). In a 2005 briefing entitled *AT&L Perspective on Joint Capabilities & Defense Cost Research Opportunities*, Dr. Nancy L. Spruill, Director, Acquisition Resources & Analysis, USD (AT&L), asserted concerning the MID 917, "Current cost accounting systems are not conducive to the collection of platform-specific costs... [nor are they conducive to] our ability to confirm that

estimated savings and cost avoidance is actually occurring” (Spruill, 2005, p. 34). Dr. Jacques S. Gansler (2006), Professor and Department Chair at the Center for Public Policy and Private Enterprise at the University of Maryland stated that a recent senior external review group at LMI Government Consulting concluded that the initiative did not aide the DOD in achieving its primary logistics goals..

More evidence regarding the challenge of inconsistent program funding comes in a 2008 report from the GAO. The GAO (2008) found:

For the last several years, some of the Army’s PBL arrangements we reviewed did not receive all of their support funds at the beginning of the fiscal year but rather increments throughout the year. Program officials for one Army system said that at one point during fiscal year 2005, they almost had to discontinue some of the support provided under the contract because they did not have adequate support funds. Additional funding was eventually made available after the program office notified its major command of the situation. Army program officials said that this funding instability further exacerbates the impact of having short-term contracts, since none of the funds are available to the contractor to make business arrangements or investments for reliability improvements (p. 43).

In the 2011 review of methods to optimize total system availability and reduce program cost through PBLs, LTC David M. Kaczmariski outlines an additional complication of unstable funding streams. When the contractors receive fragmented and constrained funding, they may choose to use CFR or “at-risk” purchases to meet their objectives, and anticipate the Government ultimately reimbursing them. When such purchases are not on contract or backed by an appropriation, the Government has no right to inspection, has no means to seek corrective action, and may pay a higher price due to the contractor working outside BCA (Kaczmariski, 2011).

The DOD inability to stay true to its agreed-upon funding schedule, usually due to volatile DOD budgets and changing priorities, creates hardships for the support provider and

stifles the cost control initiatives that the contract would have otherwise provided. Timely receipt of funding is critical to contractors. The corporation forecasts receipt of payments to make crucial investment decisions such as forward pricing rates, vendor accounts payable periods, requirements in return on capital investments, and payroll. If the contractor does not receive funding as planned, it may not be able to pay its workforce. The lack of predictable funding limits the ability of the contractor to make purchases from vendors to support the contract, and may even break long-term pricing agreements, resulting in penalties that would pass to the Government through higher costs. The lack of funding also prevents the contractor from investing in those capital improvements aforementioned as critical enablers to PBL arrangements.

Conclusions & Recommendations

Conclusions

Professionals in DOD Acquisition attest that, “you get what you incentivize”. This research found widespread consensus that the PBL Top-Level Metric Objectives (Operational Availability, Operational Reliability, Cost-per-Unit Usage, Logistics Footprint, and Logistics Response Time) influenced program improvement in almost every circumstance under the PBL initiative. Even so, there is a pervasive lack of strategies that incentivize support providers to control costs. This study uncovered a body of best practices beginning to form, and a general consensus on some avenues for improvement that the Government should explore. The objective was to ensure that DOD Program Managers could tailor Acquisition strategies to overcome the documented barriers to cost control in the successful execution of PBL programs. This research reviewed the following barriers that do not properly incentivize contractors to control costs: contracts that (1) utilize contract types which do not encourage cost control; (2) have not

properly assigned asset and process ownership; (3) apply shorter contract lengths which do not allow contractors to see opportunity for return on investments in affordability improvements; and (4) apply inconsistent funding streams which de-incentivize the contractor to devote resources towards enhancing process efficiency.

Recommendations

The following recommendations offer ways that DOD programs can increase performance. They allow for the objective to deliver to the Warfighter the right capability at the right time, and within acceptable funding constraints.

Recommendation 1. The DOD should require acquisition program offices to chronicle PBL cost data in a standardized format. The standardized format and will necessary details to allow for cost analysis and reporting.

Recommendation 2. The DOD should require program managers to develop, and keep updated, a BCA. The BCA will have the most current data to support all PBL acquisition strategy decisions.

Recommendation 3. In PBL acquisition strategy development, program managers should develop a BCA with a risk analysis. The BCA will determine whether a fixed price incentive or a cost plus incentive contract would provide the greater overall outcome in terms of program cost.

Recommendation 4. In PBL acquisition strategy development, program managers should aim to utilize long-term contracts (5-10 years). Longer contract terms better enable the support provider to recoup investments in improved weapons-support processes.

Recommendation 5. In PBL acquisition strategy development, program managers should allow the support provider a high level of inventory ownership. Increased inventory ownership will better enable the provider to carry less inventory holding cost, and be able to invest more in reliability improvements.

Recommendation 6. The DOD should apportion PBL funding in the first quarter of the fiscal year sufficient to fund 12 months of effort. More timely and sufficient funding will better enable providers to make long-term investments.

Recommendation 7. Where possible in sustainment, program managers should make use of Working Capital Fund to pay for their PBL efforts. Working Capital Funds may allow for contracts with performance periods spanning multiple years.

Recommendation 8. In PBL arrangements where O&M is the appropriate funding type, the program manager should request that the MILDEP provide a single line of accounting with which to fund the contracted effort. This would maximize the contractor's flexibility in meeting performance goals.

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Acronyms

Acronym	Description
AT&L	Acquisition, Technology, and Logistics
BCA	Business Case Analysis
CFR	Contractor Funded Requirements
CLS	Contractor Logistics Support
CPIF	Cost Plus Incentive Fee
CPT	Captain
DAU	Defense Acquisition University
DEPSECDEF	Deputy Secretary of Defense
DOD	Department of Defense
D,PA&E	Director, Program Analysis and Evaluation
L&MR	Logistics and Materiel Readiness
FFP	Firm Fixed Price
FP	Fixed Price
GAO	Government Accountability Office
IG	Inspector General
LTC	Lieutenant Colonel
MAJ	Major
MID	Management Initiative Decision
MILDEPS	Military Departments

O&M	Operations & Maintenance
OPSEC	Operations Security
PBL	Performance Based Logistics
PMO	Program Management Office
PPBES	Planning, Programming, Budgeting, and Execution System
PPBS	Planning, Programming, and Budgeting System
PSI	Product Support Integrator
PSP	Product Support Provider
QDR	Quadrennial Defense Review
RDT&E	Research, Development, Test, & Evaluation
SSCF	Senior Service College Fellowship
USD(AT&L)	Undersecretary of Defense for Acquisition, Technology, & Logistics
USD(C)	Under Secretary of Defense (Comptroller)

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