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Performance Based Contracting

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Introduction

Performance Based Logistics (PBL) is a concept that has been around for many years and has grown in widespread application throughout many Government departments as the contracting method of choice: "PBL has become the default consideration for logistics support planning within DoD and a principle component of Total Life Cycle Systems Management (TLCSM)."¹ A search for papers based on the term Performance Based Logistics will yield a large sample of results, a portion of which are included as references to this paper. Yet despite the plethora of resources dedicated to this subject, as technical, contracting or procurement authorities we are still faced with daunting and complex questions on how to proceed when faced with logistics contracting requirements.

Fundamentally it is quite simple to see historical patterns of contracting methodologies that inherently encourage contractors to achieve maximum profit when diametrically opposed to Government contractual goals. In other words, in traditional cost plus contracting (based on time and material plus a set profit margin or mark-up) a contractor makes the most profit by working on Government equipment as frequently as possible and conducting as much repair, overhaul and replacement work on this equipment as possible while, as the operators of this equipment, the Government's goal is to achieve the longest in service performance periods and to minimize time, work and therefore cost required by the contractor. This in no way implies any unethical or purposefully deliberate effort by the contractor to decrease performance or drive up cost of the contract as this type of contractor would not long survive in a highly competitive industry, however it does logically lead to the conclusion that there is little incentive in these traditional mechanisms for the contractor to fundamentally improve in-service performance or time between repair and overhaul, nor does it reward process improvements and efficiencies, the savings of which would be handed onto the Government, while decreasing the contractor's profit.

Performance Based Logistics has developed from the realization that improvements over the cost plus method of contracting could be made if alignment of the motivation of the contractor and of the user were achieved in order to create win-win scenarios typically based on long-term relationships. This has led to the concepts of incentive programs whereby contractors were paid bonuses for achieving set targets or, alternatively, penalties for lack of performance. Further progress in these concepts led to firm fixed price contracts where guaranteed prices were negotiated regardless of equipment throughput and even contracts based on usage rate, for example power by the hour contracts or lease contracts where the equipment is actually owned by the contractor.

These relatively new approaches to contracting have been put into large application, but they do not always result in the desired outcomes. The success of any given PBL contract will be achieved in the details of its application, starting from the bid evaluation and initial contractor selection phase and continuing throughout its implementation and entire life cycle management, however gaining expertise in the application of contracting best practices takes years and many of our technical and contract authorities only spend two to three years in their positions. Therefore further analysis into these methods is required and some insight into how best to apply these theories is needed.

The goal of this research paper is to conduct a significant review of experience in Performance Based Logistic contracts to date across several countries in order to develop a benchmark from which to observe trends. From these observations the first research

¹ US Department of the Navy Performance Based Logistics Guidance Document Memorandum Jan 27, 2003

question to be answered is: what are the challenges we face within the government contracting framework in implementing effective PBL contracts and specifically how do we overcome them. The second research question will be: is there a list of criteria for selection of contract requirements that are best suited for PBL consideration, or are there some contracts that are better off to be handled in the more traditional contracting methods? The third research question will be: given that a decision is made to proceed with a performance based contract, what trends have been observed in establishing metrics or performance targets that succeed most frequently, and perhaps more importantly can we highlight what metrics have resulted in either poor results or even counter productive trends and avoid them in the future?

The first part of the paper will be aimed at defining what PBL is and what it should be expected to achieve, and to also highlight its limitations. The second part of the research paper will gather evidence of results of experience with PBL to form a benchmarking from which to learn and draw conclusions on the witnessed trends. The countries chosen for benchmarking are: Canada, as I am a Canadian Officer with some contracting experience with large in service support contracts and have access to further contacts with additional significant experience, Belgium because I am currently studying within the Belgian Defence College and wish for the results of this study to be directly pertinent to the Belgian Defence Forces and also the UK, Australia and the USA due to the wealth of documentation and study already carried out within their defence and government resources. The third part of the paper will highlight some of the challenges that contract managers face within defence forces in applying lessons learned and best practices from contracting experience and outline some of the ways these challenges can be overcome. The next part of the paper will suggest a list of selection criteria for suitability of potential contracts for application of PBL theory and will also highlight what mechanisms, metrics and approaches have been observed from the benchmarking to most reliably result in positive outcomes. Finally, the paper will finish with some conclusions and recommendations for future contracting requirements.

1. Performance Based Logistics - Definitions

1.1. Performance Based Logistics

The term Performance Based Logistics first originated within the US Department of Defense (DoD) in the 1990's. It is, as stated by Bill Kobren (2009), "a strategic readiness imperative" aimed at reversing what has been described as a "death spiral" of rising O&M costs and declining equipment readiness by Gansler (2000) in a presentation to Congress.

"Our equipment is aging. We cannot replace much of that equipment in the near future. Consequently, our Operations and Maintenance (O&M) costs will continue to escalate. This results in reduced readiness - yet at increasing costs. And, unless we reverse the trend quickly and deliberately, we face what I have described as a "death spiral" - a situation where reduced readiness requires us to keep removing more and more dollars from equipment modernization and putting it into daily O&M, thus further delaying modernization, causing the ageing equipment to be over-used, further reducing readiness, and increasing O&M - a vicious circle."²

PBL was first used officially in the 2001 Quadrennial Defense Review followed by the DODD 5000.01 (the Defense Acquisition System) requiring that PBL strategies be applied to new and legacy weapons system support.³ Within the US DoD, PBL is defined as "the purchase of support as an integrated, affordable performance package designed to optimize system readiness and meet performance goals for weapon systems through long-term support arrangements with clear lines of authority and responsibility. Simply put, performance based strategies buy outcomes, not products or services."⁴

The term PBL has grown over the years and encompasses much more than the term implies. PBL is not solely about logistics, in fact it has become synonymous with Performance Based Life Cycle Product Support⁵ and the Defense Acquisition University (DAU) within the US DoD tightly aligns the definition of PBL with Total Life Cycle Systems Management (TLCSM) which encompasses the complete life cycle management of a system from conception to retirement. DAU goes on to further outline that PBL, as a product support implementation strategy, encompasses TLCSM, Condition Based Maintenance, Public-Private Partnerships, Product Support Integration, National Technology and Industrial Base and End-to-End Customer Support as a "Supportability Grid".

1.2. Performance Based Contracting

Performance Based Contracting (PBC) is a term used within the Australian Defence Force and is often used in the US interchangeably with the term PBL but really is a subset of the larger body of thought of PBL. PBC is the business arrangement or the contracting strategy which defines the agreement between the user and the support provider. PBC represents a dramatic change over more traditional transactional support contracts which have been historically based on a cost plus strategy. Cost plus contracts are quite literally based on the concept of paying a contractor based on time and material used plus a set profit margin. This type of contract has traditionally been easy to calculate, easy to audit for accounting purposes and therefore easy to justify with

² Gansler, 2000, as cited by Kobren B., What Performance Based Logistics is and What it is Not and What it Can and Cannot Do, DAU, 2009 p.256.

³ Defense Acquisition University, PBL: A Program Manager's Product Support Guide, Mar 2005.

⁴ Ibid.

⁵ Air Force Instruction 63-101/20-101, Integrated Life Cycle Management, 07 Mar 2013.

public contracts, however it does a poor job of aligning government or military requirements and goals with support contractor motivations (i.e. their bottom line).

Cost Plus contracts are often referred to as transactional⁶ where the contractor makes money based on every transaction and the depth and scope of that transaction. This quite simply means that the contractor makes the most money based on increasing frequency of equipment visits to their facility as well as the more parts that need replaced and the more rework required. From a warfighter and an equipment life cycle material manager's perspective the goal is to optimize system readiness. This translates to availability which is optimised as reliability and time between failure or overhaul cycles are increased. From this perspective, quite obviously under a transactional or cost plus contract mechanism the government's and the contractor's motivations are clearly not aligned.

The use of Performance Based Contracting as defined in the DAU PM's support guide is the use of long-term contracts with incentives tied to performance.⁷ These incentives can come in the form of award terms, reward or penalty fees tied to performance metrics and should also ideally be fixed price (e.g. tied to hours of operation or other unit of use). The metrics used in these contracts should be as high level as possible and directly linked to the outcomes or capabilities required by the warfighter. At the top level these metrics should be based on warfighter performance requirements and include only a few simple, realistic and easily quantifiable metrics such as availability, reliability and logistics footprint.⁸ In this way the government and the service provider can achieve alignment of their motivations.

In these contracts, the contractors are inherently encouraged to invest in process improvements, increased equipment reliability and ultimately more availability as the longer the equipment stays in use and the fewer shop visits required the greater the resultant profit margin. The full power of this approach is only realized under a firm price contract in which a service provider can really unleash their ingenuity and creativity to actively strive for process improvements in efficiency and reliability. Conversely, the investment into these improvements will only be attractive to the service provider if there is sufficient time in the contract to realize the return on investment.

General Patton Quote:

"Don't tell people how to do things, tell them what to do and let them surprise you with their results."

⁶ Boyce J. and Banghart A., Performance Based Logistics and Project Proof Point, Defense AT&L Project Support Issue, March-April 2012 p. 28.

⁷ Defense Acquisition University, PBL: A Program Manager's Product Support Guide, Mar 2005.

⁸ Ibid.

2. Benchmarking

2.1. United States

The terms “Performance Based Logistics” and “Performance Based Contracting” first originated in the US DoD. Performance Based Logistics is the preferred DoD product support strategy and its application is dictated in the Defense Planning Guidance (DPG) since 2001 and the DoD directive 5000.1, the Defense Acquisition System, since May, 2003.⁹ It is estimated that the US government spends more than \$90 Billion per year on equipment sustainment, it is not surprising then that an extensive amount of research and development effort has been spent on the most effective and efficient manner to manage contractual support arrangements. This being said, a great deal of debate has arisen in the evaluation of the effectiveness of these efforts to date. It is often difficult to obtain objective evidence with regards to the success of implemented contracts due to the nature of the vested interests involved in the debate. In fact many of the claims with regards to the strengths and weaknesses of the experiences to date have been assessed to be based on emotionally charged anecdotal evidence.¹⁰ With these statements in mind, many efforts have been made to measure and document actual PBL contracting experiences. A few examples of these are:

Dr. Daniel Goure from the Lexington Institute in 2009 states that most Performance Based Agreements (PBAs) have proven successful, providing marked increases in equipment availability and also appear to be reducing costs. He quotes that a study of 23 PBAs show an average annual savings of \$21 million. He concludes that PBL works and has led to improvements in availability of 20-40 percent while reducing costs by 15-20 percent. In his report, Dr. Goure cites examples of successful PBAs applied to the C-17, F/A-18, Tactical Airspace Integration System (TAIS), H-60 helicopters, B-2 and the F-22 aircraft.¹¹

Randy Fowler, the Assistant Deputy Undersecretary of Defense for Material Readiness wrote an article for the Defense Acquisition University, Defense AT&L journal in February 2009 stating that "PBL is a DoD acquisition-sustainment superhero that has been underappreciated to this point".¹² Fowler provides the table at Fig 1 as examples of programs with demonstrated cost benefits. He goes on to state that most experts estimate that there are over 200 applications of PBL to date and that the DoD need more clear and compelling insights into the cost benefits of PBL strategies.

<i>Program</i>	<i>System Description</i>	<i>PBL Owner</i>	<i>Total Cost Benefit (\$M)</i>
C-17	Transport aircraft	Air Force	\$477
F/A-18	Fighter/attack aircraft	Navy	\$688
AH-64	Attack helicopter	Army	\$100
TOW-ITAS	Integrated mobile missile and targeting system	Army	\$350
Sentinel AN/MPQ-64	Mobile air defense radar	Army	\$302

Figure 1: Examples of U.S. PBL Cost Success

⁹ Defense Acquisition University, PBL: A Program Manager's Product Support Guide, Mar 2005.

¹⁰ Boyce J. and Banghart A., Performance Based Logistics and Project Proof Point, Defense AT&L Project Support Issue, March-April 2012 p.26.

¹¹ Goure D., Back to the Future, The Perils of Insourcing, The Lexington Institute, 2009 p.2.

¹² Fowler R., Misunderstood Superheroes, Batman and Performance Based Logistics, Defense AT&L: Jan-Feb 2009, p. 13.

As evidence of some of the performance benefits realized by a few of the more prominent PBL applications Fowler presents figure 2. Despite the admission that clearer cost data is required, Fowler concludes that the evidence is nevertheless clear, PBL works and in fact delivers dramatic improvements in both better performance and lower total operating cost.¹³

<i>Program</i>	<i>System Description</i>	<i>PBL Owner</i>	<i>Availability Improvement</i>	<i>Cycle Time Reduction</i>
F/A-18	Fighter/attack aircraft	Navy	23%	-74%
Tires	Aircraft tires	Navy	17%	-92%
F-22	Fighter	Air Force	15%	-20%
UH-60 Avionics	Utility helicopter	Army	14%	-85%
F-404 Engine	Jet engine for the F/A-18 aircraft	Navy	46%	-25%

Figure 2: Examples of U.S. PBL Performance Success

Bill Kobren, the Defense Acquisition University Logistics and Sustainment Center director, wrote an article in October 2009 stating that despite PBL strategies success over the last decade, misperceptions still exist. Kobren states that PBL contracts regularly improve availability by 20-40% and reduce costs by 15-20%. He goes on to state that "when it comes to delivering performance outcomes, PBL works".¹⁴ Although Kobren does not provide examples of the data that support these statements, he does quote a study by Miller in 2008 found in the Aviation Week and Space Technology volume 169.

The Department of the Navy issued a PBL guidance and best practices memo in Dec 2012, in which it is stated that "PBL has allowed the Naval Aviation Enterprise (NAE) to improve support to the Warfighter and achieve weapon system readiness at lower life cycle costs".¹⁵ This document goes on to state that PBL offers the best strategic approach for delivering required life cycle readiness, reliability and ownership costs.

Perhaps the most conclusive study conducted to date has been chartered by the Principle Deputy Assistant Secretary of Defense for Logistics and Material Readiness, called Project Proof Point in April 2012. This study was chartered as an independent, fact based assessment of PBL product support strategies.¹⁶ Project Proof Point analyzed 21 of 89 PBL programs identified by the US services. They have assessed this as a sufficient sample size to support generalizations.¹⁷ The Project Proof Point team analysed data across a representative sample of systems, sub-systems and components across all services and varied contract structures in order to determine what the preponderance of evidence shows with respect to the success of PBL contracts to improve contract performance while reducing overall cost. An aggregated summary of their findings is represented in figure 3.

The conclusions of this study show that, "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 com-

¹³ Fowler R., Misunderstood Superheroes, Batman and Performance Based Logistics, Defense AT&L: Jan-Feb 2009, p. 13.

¹⁴ Kobren B., What Performance Based Logistics is and What it is Not and What it Can and Cannot Do, DAU, 2009 p. 263.

¹⁵ Department of the Navy, PBL Guidance and Best Practices Memo, 03 Dec 2012

¹⁶ Boyce J. and Banghart A., Performance Based Logistics and Project Proof Point, Defense AT&L Project Support Issue, March-April 2012 p. 26.

¹⁷ Ibid, p.28.

ponent readiness/availability when compared to non-PBL arrangements.”¹⁸ 17 of the 21 programs studied showed improved performance and lowered cost over time. They have further concluded that a conservative estimate of savings realized by PBL programs over traditional approaches is between 10 - 20 percent.¹⁹

<i>Program</i>	<i>Type</i>	<i>Maturity</i>	<i>Contract Length</i>	<i>Contract Type</i>	<i>Cost</i>	<i>Performance</i>
1	Sub-System	Green	5 years	Firm Fixed Price w/performance incentives	▼	▲
2	Sub-System	Green	5 year, one 3 year & one 2 year option	Firm Fixed Price w/performance incentives	▼	▲
3	Component	Green	5 year base, two 5 year options	Firm Fixed Price w/performance incentives	▼	▲
4	Sub-System	Green	5 year base, one 5 year option	Firm Fixed Price w/performance incentives	▼	▲
5	Sub-System	Green	4 years	Firm Fixed Price w/performance incentives	▼	▲
6	System	Green	5 years	Firm Fixed Price w/performance incentives	▼	▶
7	Sub-System	Green	1 year, 9 option years	Firm Fixed Price w/performance incentives	▼	▶
8	Component	Green	5 month base, 7 option years	Firm Fixed Price w/performance incentives	▼	▲
9	System	Green	5 years	Firm Fixed Price Award Fee	▼	▲
10	Sub-System	Green	5 years, one 5 year option	Firm Fixed Price w/performance incentives	▼	▲
11	System	Green	5 years	Firm Fixed Price w/performance incentives	Indeterminate	▲
12	System	Yellow	Yearly	Cost Plus Incentive Fees	▼	▲
13	Sub-System	Yellow	5 years	Firm Fixed Price	▼	▶
14	System	Yellow	6 year base, 6 option years	Cost Plus Award Fee	▼	▲
15	System	Yellow	1 year base, 7 option years	Fixed Price Award Fee, Cost Plus Incentive Fee	▼	▶
16	System	Yellow	5 years, with option years	Firm Fixed Price w/performance incentives	▼	▼
17	System	Yellow	1 year base, 7 option years	Fixed Price Incentive Fee	▲	▶
18	System	Yellow	1 year	Firm Fixed Price w/performance incentives	▲	▲
19	System	Yellow	1 year	Cost Plus Incentive Fee/ Cost Plus Award Fee	▲	▶
20	System	Orange	1 year	n/a	Indeterminate	▶
21	System	Orange	1 year	Cost Plus Fixed Fee	▲	▶

Figure 3: Project Proof Point - PBL Program Review

¹⁸ Boyce J. and Banghart A., Performance Based Logistics and Project Proof Point, Defense AT&L Project Support Issue, March-April 2012, p30.

¹⁹ Ibid p. 30.

2.2. United Kingdom

Through Life Capability Management (TLCM) is the UK MoD policy on defence acquisition and Life Cycle management. It is defined as "an approach to the acquisition and in service management of military capability in which every aspect of new and existing capability is planned and managed coherently across all Defense Lines of Development from cradle to grave".²⁰ The MoD Defence Standard 00-600 lays out the requirement within TLCM to optimize through life availability whilst minimising cost and risk. This Def Stan is specifically designed to support contract activity and talks frequently to the optimization of Through Life Finance, availability and supportability.²¹ It is often referred to as managing capability rather than managing equipment.²² The Defence Strategy for Acquisition Reform goes further into defining the relationship with industry that the MoD recognises they need to develop, including more long-term partnering arrangements with the overall aim of greater long-term certainty in order to allow industry to make future investment decisions that support UK interests. It also states the requirement to examine whether the benefits of their relationship with industry are being maximised and the requirement to improve their ability to understand how better to incentivise cost reduction and value for money.²³ Although there is no prescriptive direction on the type of contracting mechanism that are preferred (i.e. firm fixed price, cost-plus) there is repeated direction to incentivize cost reduction, to contract for required performance and to obtain the best long-term contracts with the best value for money.

The UK MoD is currently undergoing a Defence Reform and has recently published a document titled, The New Operating Model - How Defence Works, in Dec 2012. It is likely that this will have an effect on the Department of Defence Equipment and Support (DE&S) and the term TLCM likely will become Fin/Mil Cap (Finance/Military Capability).²⁴ This new operating model, also identifies that the management of contracts will be to agreed requirements for equipment, goods and services to support military capability through-life at best long-term value for money.²⁵ A few examples of successful application of the tenets of PBC in the UK's approach to TLCM are with the Nimrod, the Tornado, the Sea Harrier and the Chinook aircraft. According to a report by Dr. Daniel Goure, the Tornado contract resulted in a 35% decrease in aircraft downtime and reduced repair man-hours by 40%, also the success achieved in the Chinook helicopter program leads to the expected savings of \$250 M over the life of the aircraft while guaranteeing a specified level of aircraft support.²⁶

2.3. Australia

The Australian Department of Defence (DoD) has fully embraced Performance Based Contracting and have in fact written a PBC handbook outlining their vision linking reward to the level of performance based on delivered outcomes rather than the work undertaken.²⁷ The goal is to encourage innovation and productivity improvements under long-term contracts.

²⁰ Deloitte, Through Life Capability Management - Enabling Effective and Efficient Acquisition and Support of Defence Capability, 2010.

²¹ United Kingdom MoD, Def Stan 00-600 issue 1 dated 23 April 2010.

²² United Kingdom MoD, Defence Strategy for Acquisition Reform, 2010, p. 15

²³ Ibid, p. 18.

²⁴ Clive Murgatroyd, Lecturer at the Defence Academy of the United Kingdom.

²⁵ UK MoD, The New Operating Model - How Defence Works, Dec 2012.

²⁶ Goure D., Performance Based Logistics: A Primer for the New Administration, 25 April 2009.

²⁷ ASD PBC Handbook (Version 2), Feb 2007.

The use of the following PBC principles is mandated for application in all Aerospace Systems Division contractual considerations²⁸:

- The achievement of Value for Money;
- Key Performance Metrics should be simple, measurable and meaningful;
- Based on long-term contracts associated with the expectation of continued performance improvements and reduced cost of ownership across the life of the contract; and,
- The right to terminate the contract for consistent under-performance.

The Australian DoD PBC handbook outlines a standardized framework to be applied in establishing these contracts for all contracts dealing with Through Life Support (TLS), Contracted Maintenance (CM), Repairable Item (RI) support and Aero Engine Support.

Effective Jun 2011, the Defence Material Organisation (DMO) of the Australian DoD has released a new handbook which integrates a full Productivity and Performance-Based Contracting (PPBC) approach. The DMO has stated that "the standardised framework for PPBCs has been derived from traditional Performance Based Contracts (PBCs), which have been found to provide sound performance management, but have not resulted in cost reductions to Defence".²⁹ The new handbook has been designed to be used across all services and the new additions are specifically aimed at motivating both the supplier and the DoD to reduce the Total Cost of Ownership. The additional key provisions included in the PPBC are: performance payments linked to key performance indicators (KPI) and performance and efficiency linked to award terms.

The DMO is targeting a significant reduction of TCO in the application of its PPBC handbook in what they have termed their Strategic Reform Program. Through the application of these strategies, the DMO has stated that they expect to realize a savings of \$5.1 billion.³⁰ These savings are expected to be realised through the three main efforts:

- better planning and management of their equipment repair and overhaul schedules and therefore increased product line efficiency;
- increased productivity at the contractor, through business process improvements and technology improvements; and,
- improved contracting mechanisms.

The PPBC handbook outlines a "continuous improvement and efficiencies" program to be applied to their firm priced contracts that would include a cost sharing of any savings at pre-negotiated contract review periods. In this manner, for any process or efficiency improvements the contractor would initially realize 100% of the savings, but at the contract review period these savings would then be shared going forward.

The DMO also states that the increased productivity will be incentivized most commonly through award terms³¹ and the sharing of the savings. Under this model, the expectation is that the contract price would decrease over time, while the contractor's profit would increase as shown in Fig 4.

²⁸ ASD PBC Handbook (Version 2), Feb 2007.

²⁹ Australian DoD, PPBC Handbook, Jun 2011

³⁰ Ibid

³¹ Award Terms are defined as contract extensions based on meeting defined performance targets.

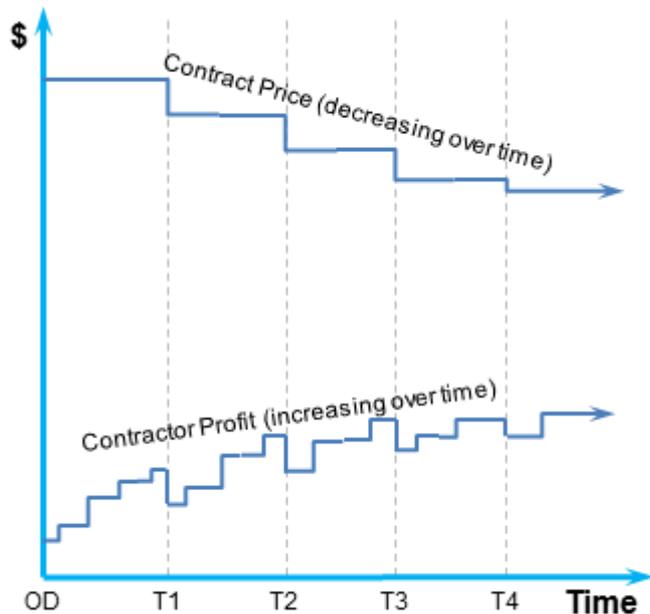


Figure 4: Award Term Pricing and Shared Savings³²

2.4. Canada

In the late 1990's the Canadian Forces were facing the after effects of significant reductions of forces personnel and operating budget, the Aerospace Equipment and Program Management (AEPM) Division alone was forced to cut its military and civilian workforce by 45 percent.³³ Thousands of traditional time and material contracts were being managed by very large sections of weapons system managers for fleets that were frequently behind on delivery schedules and showing unsatisfactory performance and poor contractor accountability.³⁴ Traditional contracting mechanisms for weapon system support programs were being scrutinized in great detail. Review of contract strategies involving performance based logistics being implemented in allied forces led to the development and adoption of a new contracting strategy within the Canadian Armed Forces called "Optimized Weapon System Management". This strategy was released in 2002 and directed for implementation on four of the main Air Force fleets with sufficient life remaining on the fleets to realize the benefits: CC-130 Hercules, CF-18 Hornet, CP-140 Aurora and CH-146 Griffon aircraft.

The OWSM intent was to:

- move from having many short-term contracts to fewer long-term contracts,
- decrease the number of civilian and military personnel needed to manage and execute maintenance and repair activities,
- transfer more responsibility to the private sector, and
- establish performance objectives for private sector firms and provide incentives to improve performance and reduce costs.³⁵

³² Australian DoD, PPBC Handbook, Jun 2011

³³ Waldock D., The Use of Performance-Based Service Acquisition within the Department of National Defence, 2009 p. 6.

³⁴ Auditor General of Canada Fall report 2011, Chapter 5: Maintaining and Repairing Military Equipment - National Defence, para 5.4.

³⁵ Ibid, para 5.42.

Additional study led to the development of a second newer contracting framework to be implemented for maintenance and repair of newly acquired weapon systems and negotiated concurrently with the acquisition process. This new strategy is called the In Service Support Contracting Framework (ISSCF) and has been promulgated as policy by the Assistant Deputy Minister for Material, ADM(Mat), since July 2008.³⁶ The objective of the ISSCF is to achieve maximum value for money, at a level that meets or exceeds operational requirements and adheres to the following criteria³⁷:

- shall define clear accountabilities for the contractor and the GOC; and be:
- results-based;
- performance-based;
- incentivized;
- fixed price or fixed price per operating unit, e.g. hour, kilometer, etc;
- long-term;
- terminable;
- fleet-centric and all encompassing; and,
- scalable.

Table 5 outlines the key differences between the contracting approaches:

	<i>Traditional Contracting</i>	<i>Optimized Weapon System Management</i>	<i>In Service Support Contracting Framework</i>
Date released as policy	N/A	2002	2010
Applies to	Many existing Fleets	Several existing fleets	All new fleets
Number of Contracts	Hundreds of support contracts per fleet	1-5 main bundled contracts per fleet	1 all encompassing contract per fleet
Level of Application	Component Level	System Level	Fleet Level
Contract Type	Time and Material	Performance based plus incentives, fixed price where possible	Performance based plus incentives, Fixed Price
Contract Term	Short Term	5 year +	20 year +
Required Management Resources	Large departmental management staff	Moderate departmental management staff	Small departmental management staff

Figure 5: Canadian Forces Contracting Approaches³⁸

The Fall report of Canada's auditor general in 2011 took a detailed look at the OWSM and ISSCF contracting efforts to date in order to evaluate how well government is managing its activities, responsibilities and resources. Fleets which have been transitioned, or are in the process of transitioning to the OWSM framework include the Wheeled Light Armoured Vehicle (WLAV), the CC-130 Hercules (E and H models), the CP-140 Aurora, the CF-188 Hornet, and the CH-146 Griffon. The Department of National Defence states that cost savings have already been achieved as a result, along with greater administrative efficiencies and most importantly, increased fleet

³⁶ Auditor General of Canada Fall report 2011, Chapter 5: Maintaining and Repairing Military Equipment - National Defence, para 5.56.

³⁷ Canadian Forces, DAOD 3022-1, Management of Procurement of In-Service Support for CF Platforms, Aug 2010.

³⁸ Auditor General of Canada Fall report 2011, Chapter 5: Maintaining and Repairing Military Equipment - National Defence, para 5.45.

availability.³⁹ The auditor general's report does not dispute these statements, but does conclude that due to significant scope and responsibility changes between the government and the contractor, objective cost data is not possible to produce accurate costing comparisons. Also, of the original ten contracts selected for transition to the OWSM model, only three of them achieved the target date for implementation of Dec 2005 and there remain a further five contracts that are still not successfully converted as Jan 2013.⁴⁰ The auditor General's report concluded that the implementation of the new contracting approach for existing military equipment (OWSM) has been slower and more limited than planned and that National Defence has lost opportunities to derive the potential benefits of improved performance, improved accountability, and reduced costs.⁴¹ The reasons for these delays will be further discussed in Chapter 3, challenges to successful PBC implementation. Additionally, the Government of Canada has awarded long-term, performance-based ISSCF contracts for its new CC-130J tactical airlift fleet, the Chinook F-Model Helicopter fleet and the Close Combat Vehicle and Tactical Armoured Patrol Vehicle projects, however these programs are either still too early in their implementation or are yet to deliver their equipment, as such no data is available for assessment to date. The RCAF's experience with PBCs and their success is shown in figure 6.

Program	Type	Maturity	Contract Length	Contract Type	Cost	Performance
CC-130	OWSM Airframe	Green	10 + years	Cost Plus with some FFP elements	▼	▲
	OWSM Avionics	Red (Pending)	5 + years	Cost Plus with some FFP elements	n/a	n/a
	OWSM Propulsion	Red (Pending)	5 + years	Cost Plus with some FFP elements	n/a	n/a
CP-140	OWSM Airframe	Yellow	10 years plus award terms up to 25 years	Cost plus incentives	TBD	TBD
	OWSM Avionics	Yellow	10 years plus award terms up to 25 years	FFP and some cost plus, incentives anticipated FY 2013/14	▼	▲
	OWSM Propulsion	Red (pending)	5 + years	Cost plus with some FFP elements	n/a	n/a
CF-188	OWSM Airframe	Yellow (2010)	Life of platform	FFP with cost plus elements, incentives anticipated 2013/14	▼	▲
	OWSM Avionics	Green	7 years plus 3 yr option	Cost plus incentives	▼	▲
	OWSM Propulsion	Red (pending)	Life of platform	Cost plus with some FFP elements	n/a	n/a
CH-146	OWSM System	Yellow (2011)	Life of platform	Cost plus incentives with some FFP elements	▼	▲
CH-147	ISSCF	Red (Pending)	24 yrs (cost reassessment every 5 yrs)	FFP	n/a	n/a
CH-149	Hybrid OWSM/ISSCF	Yellow (2007)	7 yrs plus renewable 7 yr extensions	Cost plus with FFP elements, incentives anticipated 2014/15	▶	▶

Figure 6: Royal Canadian Air Force's PBC Experience⁴²

³⁹ DND Response to Chapter 5 of the 2011 Fall Report of the Auditor General of Canada.

⁴⁰ Giguere S., Power Point presentation to Director General Aerospace Equipment Program Management, 13 Jan 2013.

⁴¹ Auditor General of Canada Fall report 2011, Chapter 5: Maintaining and Repairing Military Equipment - National Defence.

⁴² Provided by the Canadian Forces Directorate of Aerospace Equipment Business Management office, Feb 2013.

2.5. Belgium

There is currently no existing policy within the Belgian Defence Force (BDF) with respect to performance based contracting. However there has been some limited experience with PBC type contracts within the Belgian Air Force. The Airbus A330 Aircraft, Maintenance and Insurance (AM&I) service contract has been established for the contract period of 2009-2013 and is based on a guaranteed availability at a firm price.⁴³ This is in fact a service contract in which the Belgian Air Force does not own the aircraft, but instead contracts for the service provided, including the provision of 1,500 hours of aircraft use plus or minus a variability of 500 hours and includes penalties for not meeting agreed upon 92% service availability rate. The performance in this contract has been very high.⁴⁴ The BDF also has experience with a performance based contract on the simulator for the Augusta A109 Helicopter. This contract is provided based on a defined usage and guaranteed at a negotiated availability rate which is typically always met. Additionally, there is a power-by-the hour contract with Rolls-Royce for the support of the AE3007 engines on the Embraer Regional Jet and an In-Service Support contract for the NH90 that is based on a price per hour that has been negotiated by an international agency with inputs from the participating states. There exists a performance metric that is associated with the NH90 contract with respect to the supply chain, whereby if components are not provided within the set timeframe, this may lead to the provision of free support for a given number of flying hours.

While there is no policy directing performance based contracting there has been a limited precedent set to date in the contracts mentioned above, however Belgian public procurement law directs that contracts in principle be concluded on a fixed price basis (per item not per usage).⁴⁵ The law also currently limits in principle contract length to a 4 year maximum to encourage competition, but these limits can and have been extended by exception, as is the case for the AE3007 contract with Rolls-Royce which has been negotiated for 10 years.⁴⁶

⁴³ Interview with Maj Baudouin Heuninckx, Belgian Air Force, 10 Jan 2013

⁴⁴ Ibid

⁴⁵ Loi du 13 août 2011 relative aux marchés publics et à certains marchés de travaux, de fournitures et de services dans les domaines de la défense et de la sécurité, MB 1 Fev 2012, Art.7

⁴⁶ Ibid., Art.33

3. Challenges to Effective Application of PBC Theory

3.1. Overview

Proven PBL performance has been documented in numerous studies and reports, and the most robust study carried out within the US has stated that a conservative estimate of average savings has been between 10-20 percent, with associated performance increases in availability and readiness when compared to traditional contracting, however this is not universally achieved and there still exists a great deal of contracts within the Defence Forces, studied in the benchmarking section, that have not transitioned to PBC's. Considering the reported potential benefits and savings there is obviously either reluctance to transition to these new type contracts or an inability to achieve them successfully. Whether you call them challenges, barriers or occasionally operation impediments, these factors do exist that are slowing down transition to PBC's, the following paragraphs will outline a number of these and the lessons learned from the experiences to date.

3.2. Culture

The term Performance Based Logistics or Contracting is not universally welcomed or embraced. In many of the studies and presentations reviewed for this paper, there was observed repetitive reference to the statement that PBC does not equal CLS (Contractor Logistics Support), or in other words the efforts to implement PBC were not synonymous with trying to contract out the work traditionally accomplished within the Defence Forces organically to industry. Edison and Murphy (2012) state that many government personnel see PBL as a threat for exactly this reason and that this barrier must be reduced or eliminated if PBL is going to be more successful. The sometimes negative connotations to this concept can artificially slowdown the achievement of the potential benefits that may be realized and can negatively affect an organisation's ability to objectively evaluate contract options available. Resistance to change is a typical sentiment experienced in transformation efforts, this resistance is further amplified when personnel suspect that these efforts may lead to a scope change handing traditional organic work to contractors.

Lessons Learned

(US) Any process to transition to a PBC type contract needs to be completely disassociated with any agenda to drive CLS type work. An essential step in the process of applying PBL is starting with a business case analysis that focuses on the requirements of the Warfighter.⁴⁷ In any support structure that includes contractor support, the preferred product support strategy is PBL, this does not necessarily result in a change in the scope of work.

(CAN) Some of the incentive to transition to the Canadian OWSM contracts did in fact arise due to the inability to continue to support traditional multiple contracts due to the significant reduction of forces personnel. This resulted in some scope changes including the transfer of organic maintenance within units to industry and has recently been observed to have resulted in some deterioration in technician skillsets.⁴⁸ This may have been unavoidable due to the reality of the reductions that were in effect, but it must be clear that this scope change was deemed unavoidable due to the decreased manning levels, and not fundamentally due to a desire to change the contracting mechanism.

⁴⁷ Defense Acquisition University, PBL: A Program Manager's Product Support Guide, Mar 2005.

⁴⁸ Giguere S., Power Point presentation to Director General Aerospace Equipment Program Management, 13 Jan 2013

3.3. Experience

It is quite straightforward to grasp the concept of PBL after a short discussion of the strengths and weaknesses of respective contracting mechanisms, however implementing a successful PBL contract is a complex business. There is no “one size fits all”, perfect solution that can be applied to all situations prescriptively that will guarantee success every time. Experience is a key requirement both for the team that will implement the strategy, as well as the program that will be supported.

3.3.1. Team

The members of the team that will be constructing the program support strategy and eventually putting the contract mechanism together are critical in the success of the final program. Education, training and experience are key factors in the ability of the team to succeed, in fact industry experts have concluded that the lack of adequate training and experience in a team that attempts to apply performance based contracting will typically lead to understandably poor results.⁴⁹ Military officers are often posted into key positions on the procurement team but will typically stay in those positions for a relatively short time, usually only two to four years. Depending on the procurement cycle of the weapon system in question, there may occur procurement of major systems contracts during the first couple of years of a key member's posting, during which time the officer likely has very limited experience in contracting.

Lessons Learned

(CAN)⁵⁰ During the original introduction of the OWSM contracts in Canada in 2002 the T56 engine contract was already under contract renewal and the program Technical Authority (TA) was new in the job without any formal training in PBL. In an effort to become more compliant with the newly released OWSM requirements for performance metrics, the TA and Procurement Authorities implemented the first of several performance metrics. These were aimed at component turn-around-time⁵¹ (TAT) in the contractor's facility, response time for engineering analysis both tied to performance incentives and also included a Value-Engineering Change Proposal (VECP) mechanism whereby any engineering process improvement submitted to and approved by the TA that led to cost savings, would be shared between the contractor and the Government. The contractor was a very proactive and responsive contractor and always hit 100% of these performance metrics. However the VECP arrangement was originally used a few times and then very infrequently as the contract continued. Upon reflection after a couple of more years as the TA, it became apparent that the error in implementing these metrics was that they were not tied to asset availability and there was no cost aspect to the metric. In hind-sight we continued to pay for performance metric achievement even when we had more assets available than we needed and the total number of assets was never reduced as it was against the current culture to reduce equipment holdings. Additionally the sharing of the savings realized through the VECP program was originally shared at an equal 50% split, but in subsequent years the Government retained a greater share until the contractor's share disappeared by the end of three years. Based on the infrequent use, it can be assumed that this was not a great business model for the Contractor. In 2004/05 the Contractor approached the TA and suggested a better way to contract would be to stop annual rate negotiations (i.e. stop limiting their

⁴⁹ Vitasek K. and Geary S., Performance Based Logistics Redefines Department of Defense Procurement, 2008 p.64

⁵⁰ Actual experience of the Author as Technical Authority for the T56 engines in the Royal Canadian Air Force, 2000-2005.

⁵¹ TAT - Turn Around Time = time spent in the contractor's facility.

profit margins), baseline the program costs off the known past 15 years of experience (which were rising year by year) and the contractor would agree to an annual decrease in contract price, essentially a Firm Fixed Price contract with annual cost savings. Although originally greeted with enthusiasm, this idea never came to fruition once pitched to Public Works and Government Services Canada (the Procurement Authority) and was not pursued further upon the posting of the TA the subsequent year. As seen in fig 6, this contract is still pending transition to a full OWSM standard. With more experience in contract mechanisms and complete buy-in by the acquisition team, this would have been a prime opportunity to realize the benefits of a PBC with a dynamic and eager contractor.

(US) The US DoD operates a Defense Acquisition University, with a mission statement to "Provide a global learning environment to develop qualified acquisition, requirements and contingency professionals who deliver and sustain effective and affordable warfighting capabilities".⁵² This university operates five campuses, many training centers and provides on-line training across the 151,000 members of the Defense Acquisition workforce. There exist courses that provide specific training in PBL support concepts with the aim of achieving the DoD logistics goals. When comparing the successes found during the benchmarking sections of this paper the greatest amount of success stories appear to occur in the USA, and it is unlikely a coincidence that this is also the country with the most robust and deeply established training system as well.

(AUS) Early PBC contracts were successful in providing performance increases, but were not achieving cost reductions.⁵³ Transition to PPBC's introduced required continuous improvement and efficiencies tied to contract award periods and cost sharing at defined contract review periods aimed at being more effective at reducing TCO.⁵⁴ Training courses and guidance and directive has been provided through the publishing of Australian DoD PPBC Handbook, as well as the realization that "the biggest risk to the success of the Next Generation PBC framework is assessed as the lack of appropriately experienced and skilled PBC practitioners."⁵⁵

(UK) TLMC guidance is documented within the MoD Def Stan and training is provided through the Defence Academy of the United Kingdom⁵⁶. A definite correlation between countries achieving the most success within PBC and the availability of formal training is apparent. Additionally, a current transformation within the UK MoD is evaluating the possibility of running their procurement arm, Defence Equipment and Support, on a Government Owned Contractor Operated (GOCO) basis with the belief that this may lead to more stability within the contracting teams instead of seeing continual rotation of military staff through these positions.⁵⁷ The UK MoD is also exploring how they can continue to raise the profile and status of acquisition as a career route for military personnel in order to create a team of well trained and thoroughly experienced staff to lead the acquisition process.⁵⁸

⁵² www.DAU.mil, 20 Feb 2013

⁵³ Next Generation Performance Based Support Contracts - Achieving the Outcomes that Defence Requires, PBC Discussion Paper version 1.0, Feb 2010

⁵⁴ Australian DoD, PPBC Handbook, Jun 2011

⁵⁵ Australian DMO, Next Generation Performance Based Support Contracts - Achieving the Outcomes that Defence Requires, PBC Discussion Paper version 1.0, Feb 2010

⁵⁶ <http://www.da.mod.uk/prospectus/cmt/tlcm-b>, 23 Mar 2013.

⁵⁷ Clive Murgatroyd, Lecturer at the Defence Academy of the United Kingdom

⁵⁸ United Kingdom MoD, Defence Strategy for Acquisition Reform, Feb 2010, p.12.

3.3.2. Program

Program maturity and reliable performance and cost data are essential in effective application of PBC. "Good Data is needed to achieve Good PBL".⁵⁹ In order to properly understand the program requirements and to set reasonable and achievable performance and cost targets, the acquisition team needs experience with the program being supported and needs clear unambiguous technical and logistics data. Lack of such knowledge results in a difficult time assessing the risk involved and in achieving the negotiated metrics. Increased risk results in increased cost and more conservative targets.

Lessons Learned

(US) Fully integrated FFP contracts are best suited for mature weapon systems where the costs are already fully understood. For new in service support contracts it is best to start under a cost plus strategy and transition to incentive based focussed on outcomes followed by a firm fixed approach once the data is stabilized.⁶⁰ US DoD policy now states that although ideally contracts should be based on fixed price, until price risk is minimised to a level of confidence for both the Government and the contractor, fixed price contracts should be avoided.⁶¹ In the interim, a more traditional cost plus approach with the addition of some key performance metrics involving incentivization is recommended. Also, experience shows that not all major sub-systems mature at the same rate, there has been experienced some advantages to migrate sub-systems to FFP contracts separately as soon as they are deemed mature enough to implement successfully and make immediate gains without the requirement to wait to achieve entire system maturity.⁶²

3.4. Government Policy

Government procurement policy has not always been aligned with producing the best outcomes for the achievement of Defence goals. Otherwise stated, the needs of the Warfighter are not always the driving factor for our logistics support. In the transition to PBC models, contractual oversight has slowed down progressive change to more dynamic and responsive contracting mechanisms. Examples of government policy that can artificially halt progressive change within defence contracting are: limits on profit margin regardless of TCO, maximum contractual periods, industrial regional benefits and the imposition of annual rate negotiations. Forging change within defence contracting has therefore had to fight against these impediments, but experience and results are very convincing tools to bring about these changes.

Lessons Learned

(US, CAN, UK and AUS) All of these countries have implemented policy facilitating FFP style contracts that focus on outcomes in lieu of favouring transaction based (Cost Plus) relationships where appropriate.

(US) A mandatory step within the US PBL process is a Business Case Analysis (BCA) that clearly establishes the product support strategy to be adopted. The BCA is aimed at providing the best value analysis including not only cost, but also performance, reliability, maintainability and supportability factors. The BCA's will be based upon

⁵⁹ Interview with Steve Geary, Supply Chain Visions, 2 Jan 2013

⁶⁰ Ibid; Interview with Jerry Cothran, Lockheed Martin Corporation, 4 Jan 2013.

⁶¹ Defense Acquisition University, PBL: A Program Manager's Product Support Guide, Mar 2005.

⁶² Interview with Gerry Tonoff, Defense Logistics Agency (DLA) - Civilian Human Resources, 9 Jan 2013.

warfighter performance requirements and will be iterative, conducted and updated as the life cycle of the program changes and matures.⁶³

(AUS) The Australian MoD, directs the development of an Acquisition and Support Implementation Strategy (ASIS) that addresses the strategy for implementing the support arrangements for the acquired material and includes the business case analysis, the basis for DMO's management approvals and a summary of the strategy needed for submissions to Government. The goal is to ensure the overall strategy is robust, provides best value for money and performance outcomes as well as ensures government approval from the outset.⁶⁴

(CAN) Both the OWSM and the ISSCF directives mandate BCA studies prior to implementation in order to develop best value strategies for program support. There is also a process requiring the support strategy to be presented to and approved by the procurement authority, Public Works and Government Services (PWGSC), and the financial oversight approving agency, Treasury Board, prior to proceeding into the contracting phase. However, on occasion well into the bid evaluation and award stage of some contracts the program has been put on hold in order to reassess the approach. In the case of the CF-188, despite the OWSM policy having been released in 2002 with a target date for implementation by 2005, when the weapon system management office attempted to implement the OWSM contract for the airframe portion of support, Treasury Board required National Defence to complete a study of the potential impacts of this new projected contract on Canadian small and medium enterprises. This study was completed and the contract was subsequently awarded in Oct 2010.

(BEL) Belgian procurement legislation limits in principle contract length to 4 years in order to encourage competition. This has however been extended on an exceptional basis in the past when supported by a business case. An example of this is the Power-by-the-hour contract with Rolls-Royce for the AE3007 support.⁶⁵ This government policy may in fact encourage competition within defence industry on a 4 year basis, but it severely limits the Belgian Defence Force's ability to harness the advantages of performance based contracting.

3.5. Contract Negotiation

Contract negotiations or the bid process for competing major equipment support contracts are very complex, yet this is the critical phase for ensuring that government obtains the contracts that are desired that will be responsive and effective at meeting the warfighter requirements and operational needs of the supported community. Obstacles that are being met in the newer context of PBC's are sometimes due to unfamiliarity of the contractors with the new approach, or unclear terms in the requests for proposals, leading to a reluctance within the contractors to adopt the new approach and has made the negotiations more difficult.⁶⁶ Large changes in scope of traditional contracts are aimed at transferring more responsibility to the support contractors along with the associated risk of meeting the set performance metrics. However, this often involves asking the traditional contractors to take on work that they have never done before, which may represent an opportunity for them, but also involves a degree of risk in understanding the new complexities involved. Risk in contract terms results in price increases. Also defining the risks involved can be very difficult if it involves unfamiliar

⁶³ Defense Acquisition University, PBL: A Program Manager's Product Support Guide, Mar 2005.

⁶⁴ Australian DoD, PPBC Handbook, Jun 2011

⁶⁵ Interview with Maj Baudouin Heuninckx, Belgian Air Force, 10 Jan 2013

⁶⁶ Auditor General of Canada Fall report 2011, Chapter 5: Maintaining and Repairing Military Equipment - National Defence, para 5.48.

relationships with new sub-contractors, questions about technical data rights, intellectual property and supply chain relationships. It is essential to align the contract terms and performance requirements to be clearly under control of the contractor in question. For example, if a contractor is not able to meet a performance metric due to government influence, like the unavailability of government furnished spares, then the contractor cannot be held responsible for not meeting their performance outcome metric.⁶⁷ In these cases, attribution of fault can be very difficult to assess and apply. Ideally metrics should be chosen that are fully within the Contractor's scope of authority to achieve.

Lessons Learned

(US) Contracts that involve significant changes in scope and represent high complexity are too hard to achieve in a reasonable amount of time. It is important to maintain a smart buyer approach and achieve gradual or incremental growth of contracts. Full system fixed price contracts are the ideal goal, but tend to be too complicated and diverse, more success has been achieved at the sub-system and component level.^{68,69} This experience is echoed by the US Naval Aviation Enterprise (NAE) who states, "Subsystem or component level PBLs can be more easily managed, are more potentially cost effective, and should be considered and compared to all viable alternatives."⁷⁰

(US) Contractors like PBL contracts because they enable better utilization of their significant skills, capabilities and unique technical expertise to better meet customer requirements at best value cost.⁷¹

(CAN) Meaningful transfer of risk is difficult to assess and achieve. It is essential to first recognise the risk, accurately identify the factors involved then successfully transfer the risk at the appropriate cost.⁷² Some concern that defence industry in Canada would suffer due to the likelihood of an ISSCF contract being awarded to U.S. based OEMs. To counter these risks it is necessary to specify work allocation to Canadian industry.⁷³

3.6. Lack of Capacity

PBC implementation requires new specialized skills and training, high turn over rate of military personnel does not facilitate this requirement to build expertise and skill retention. If PBC is approached with the intent of reducing weapon system management personnel oversight by the theory of transferring these responsibilities directly to industry with no investment in the project teams to accomplish these transitions, the process can become lengthy and risks being completed with sub-optimal results. To achieve successful, timely and well developed PBC contracts, an upfront investment in personnel (as an implementation team) and potentially investment in process improvement or additional capability within a contractor's facility to take on work previously out of scope may be required.

Lessons Learned

(CAN) The OWSM effort in Canada was partially motivated by potential personnel oversight reductions, based on the assumption that "managing vs doing" required lower effort. Experience has shown that oversight/surveillance, risk management and contract

⁶⁷ Interview with Jerry Cothran, Lockheed Martin Corporation, 4 Jan 2013.

⁶⁸ Interview with Steve Geary, Supply Chain Visions, 2 Jan 2013.

⁶⁹ Interview with Gerald Tonoff, Defense Logistics Agency (DLA) - Civilian Human Resources, 9 Jan 2013.

⁷⁰ Performance Based Logistics Guidance and Best Practices Memorandum (April 2012)

⁷¹ Interview with Jerry Cothran, Lockheed Martin Corporation, 4 Jan 2013.

⁷² Interview with Jim Miller, Vice President Standard Aero Limited, 2 Dec 2012.

⁷³ Foster R., In Service Support Contracting in the Canadian Forces, April 2007.

compliance activities have increased significantly and while there are reduced Life Cycle Material Manager (LCMM) and Item Manager (IM) effort required, the personnel savings were not as great as originally envisaged.⁷⁴

(CAN) The 2011 fall report from the Auditor General that the OWSM implementation teams were often insufficient to undertake planned tasks and subsequently the transition to these contracts has been slower and more limited than intended. Consequently, opportunities for improvements have been missed and benefits have been delayed.⁷⁵

(US) Transition of organic in service support management staff to contracted support is not always apparent, and in the cases where it does happen, there are new areas of responsibility that this staff could be reassigned to in order to further develop the government's body of knowledge and expertise. Remaining a smart customer is essential and in lieu of position cuts, consideration should be given to reinvesting these positions into PBC expertise and implementation.⁷⁶

(AUS) The upfront investment to either incorporate a capability previously out of scope for a contractor or to make a process (i.e. reliability) improvement could be significant and the benefits of this improvement may substantially favour the government while only marginally favour the contractor. The contractor may be unwilling to make this investment depending on potential return on investment due to remaining contract length. In this type of circumstance the DMO will consider funding the upfront costs where a BCA shows value for money.⁷⁷

3.7. Funding

Budget uncertainty is an area that represents a certain degree of challenge in implementing successful PBC arrangements. Traditional cost plus contracts were ultimately very flexible from a viewpoint of increased or decreased throughput. In the event of a defence budget fluctuation, defence managers could slow down or potentially even close support lines to rebalance the annual operating budget for sustainment efforts. In the new PBC framework, the idea is to provide contracts that have long term guaranteed funding in order to encourage investment in R&D, process improvement and reliability gains. How then, can defence organisations provide these guarantees?

Lessons Learned

(US) Vitasek and Geary write that one of the biggest challenges to PBL is funding stability and that good faith and diligent efforts to reduce funding variability is essential in order to avoid lower levels of up-front investment. They recommend that a funding baseline be applied if at all possible that will protect the program over the long term.⁷⁸

(US) The US Navy has been very successful in implementing what they call the Naval Working Capital Fund (NWCF) that finances the repair of depot level work. It is a non-expiring, revolving fund and the Navy has been applying them to multi-year performance periods (often 5 year plus 5 year options). Congressional multi-year contract authority is not required for these contracts, and the size of the fund allows for

⁷⁴ Canadian Forces, Directorate of Aerospace Equipment Program Management, OWSS and ISCF Lessons Learned, June 2012.

⁷⁵ Auditor General of Canada Fall report 2011, Chapter 5: Maintaining and Repairing Military Equipment - National Defence, para 5.52.

⁷⁶ Interview with Gerald Tonoff, Defense Logistics Agency (DLA) - Civilian Human Resources, 9 Jan 2013.

⁷⁷ Australian DMO, Next Generation Performance Based Support Contracts - Achieving the Outcomes that Defence Requires, PBC Discussion Paper version 1.0, Feb 2010

⁷⁸ Vitasek K. and Geary S., A Rose by any Other Name: The Tenets of PBL, Nov 2008.

contract fluctuations to be absorbed across the Navy requirements, which would not be possible if each contract were being programmed separately.⁷⁹

(UK) The UK MoD has identified in their Def Stan a requirement to identify in the project plan sufficient and available resources to ensure ILS is addressed throughout the life cycle. This is to be well researched and documented upfront in Project funding.⁸⁰

(CAN) Canada's latest administrative order governing the implementation of new in service support contracts directs that they shall be based on fixed price, or fixed price per operating unit. The newest ISSCF contract for support of the CH-147 Chinook helicopter although not completely finalised is based on a price per operating hour, with different volume bands defined in the contract. They have fixed price per hour within any given band, but there is also a guaranteed minimum base usage level that covers the contractors risk premiums, overhead costs and fixed or given contract costs.⁸¹

⁷⁹ Defense Acquisition University, PBL: A Program Manager's Product Support Guide, Mar 2005.

⁸⁰ United Kingdom MoD, Def Stan 00-600 issue 1 dated 23 April 2010.

⁸¹ Interview with Serge Mongeon, Project Management Office (Chinook), Canadian Department of National Defence 1 Jan 2013.

4. Keys to Success and Recommendations

4.1. General

When preparing to embark on a strategy of PBC there are many guidance documents particular to the countries studied during the benchmarking section that govern national directives and priorities as well as pricing examples that will need to be studied in detail, the goal of this section is not to get into the micro details of the specific contract clauses or to try to dictate a one size fits all approach, however there are several key take-aways that appear to consistently arise in the successful application of PBC contracts that seemed to resonate as true, this section will outline these keys to success. Prior to identifying the keys for success, understanding the challenges presented in section 3 and addressing them to the extent possible in either eliminating the challenge or working within the environment or government policy as effectively as possible will greatly facilitate the ability to apply the following section.

4.2. Vision (Top Down)

The first requirement for successful application of PBC strategies is a clear and committed vision from the top leadership elements of the Defence implementation team and guidance on processes and procedures for BCA's as well as defining and standardizing performance criteria and measurements in order to avoid ad-hoc, ineffective implementation.⁸² Highly effective and well structured contractual relationships with appropriate performance measures do not happen haphazardly, or through half hearted unmotivated effort. A persistent clear direction from senior leadership down through the associated organisational structure is critical. Vitasek and Geary talk about a committed relationship with clear PBL champions working with an established PBL knowledge base, using a clearly understood stakeholder analysis and with support from an established PBL center of competency.⁸³ Lessons learned from Canadian weapon system managers show that education and leadership are key to ensuring that stakeholders are sufficiently aware of the intent in order to promote innovation and acceptance of this major transition as well as for senior leadership to communicate regularly to both internal (organic) and external (other departments as well as contractors) agencies to avoid confusion or unproductive conflicts.⁸⁴ Perhaps the most effective aspect of this vision lies in its motivation. If the motivation is clearly and credibly driven by the desire to accomplish the highest support and impact from a warfighter's perspective versus any underlying effort to simply cut costs or transition work to industry in support of a contracting out agenda there is evidence by Edison and Murphy (2012) that this can become an enabler to successful implementation, garnering support from the program staff rather than a barrier to its success based on mistrustful resistance to contracting out.⁸⁵

Recommendation

Adopt a governing policy within defence acquisition organisations that outlines PBC as the preferred solution for application of equipment support contracts where achievable and appropriate, ensuring that full governmental support is pre-approved and clearly understood. Also ensure that acquisition leadership is well versed on this policy and

⁸² Mahon D., Performance Based Logistics: Transforming Sustainment 2007, p.57.

⁸³ Vitasek K. and Geary S., A Rose by any Other Name: The Tenets of PBL, Nov 2008.

⁸⁴ Canadian Forces, Directorate of Aerospace Equipment Program Management, OWSS and ISCFE Lessons Learned, June 2012.

⁸⁵ Edison T. and Murphy A., A New look at Enablers and Barriers to performance Based Life Cycle Product Support (PBL) Implementation, Defense ARJ, Oct 2012 Vol 19 No. 4:376-393

effectively communicate the acquisition goals in ultimate support of the warfighter's requirements.

4.3. Buy-in

Closely tied to Vision is the subsequent buy-in at all levels of the acquisition/implementation team all the way through the Technical Authority, Contracting Authority and government oversight or approving authority. This buy-in needs to be garnered from as early a stage as possible with full support of the objectives being sought and the support strategy being contracted for. The request for proposal, bid evaluation and contract negotiation phases to accomplish a successful PBC are long and can often be drawn out, any internal disagreement or lack of awareness of the strategy especially at a later stage of the process, could seriously lengthen or completely derail the contracting process. An effective way to garner this buy-in at all levels is to have developed a robust business case analysis showing clear justification, again from the operational warfighter's perspective, supporting the support strategy being sought. The requirement for clearly established BCAs supporting the sustainment strategies has become a government standard adopted by the US, Canada, the UK and Australia. It is important to communicate the vision previously mentioned and provide training throughout the implementation team, fostering a full team approach motivated to achieve the desired outcomes. Vitasek and Geary have found that the teams that achieve the most success, approach training from a team perspective, often taking training at the same time and in a hands-on workshop environment. They further state that this applies equally to the contractor team, stating that the most successful companies with respect to applying PBL have implemented PBL centers of competency within their organisations.⁸⁶

Recommendations

Establish a center of excellence to act as the subject matter experts, coordinate or provide training and guidance to program managers and acquisition and in-service support teams. It is very important to invest in developing the body of knowledge with respect to PBC expertise. There are significant performance improvements and potentially large savings that can be realized when the PBC's are implemented properly, it is well worth the investment to become as proficient in the contracting mechanisms as possible.

Develop a robust business case analysis with a focus on the warfighter (deployment support requirements, operation capabilities, force generation, i.e. trg requirements), as well as solid financial data to clearly delineate the most advantageous approach to specific program support. In the cases where the conclusions of the BCA support some level of defence industry contracting a PBC approach should be evaluated at the appropriate level and scope as supported by the BCA.

There still remain challenges to full acceptance of PBC within certain government agencies, invest upfront in training, awareness and early buy-in by the entire implementation team. This is essential to a smooth and integrated approach. Invest resources to evaluate the environment and government policy that may become impediments or challenges to transition to successful PBC's and address these challenges before expending significant resources on developing a strategy that may ultimately not be achievable.

⁸⁶ Vitasek K. and Geary S., A Rose by any Other Name: The Tenets of PBL, Nov 2008.

4.4. Alignment of Motivation

The alignment of the motivations involved between the government and the contractor is really the heart of this process. There is much talk about the performance based aspect of the contracts and "contracting for outcomes" instead of paying for transactions, and certainly it is important to get valid metrics and measures in place, but the real driving force behind the fundamental change in contracting strategy was the realization that the Government and the contractor were adversely motivated. Essentially in traditional approaches to contracting the only way to get ahead was in a zero sum approach by negotiating or driving the other side's gains down. The proper alignment of motivation is the catalyst to successful long term contracts.

4.4.1. Contract Format

Potentially the most effective way to align the customer and contractor's motivation is in the essence of the contract model. If we get this aspect right, and truly create win-win contracts, the administrative aspect of applying performance metrics and calculating incentives, although necessary and essential to understand ongoing costs and follow-on contract pricing, should become of secondary importance and the contractor won't be motivated to try and navigate through the application of the metrics to squeeze out the small amounts of profit that represents, rather they will fundamentally be doing the things that are mutually beneficial and the relationship will become a true partnership. As one industry representative stated, the "P" in PBC, could be replaced by "Partnership".⁸⁷ Incentives, as will be discussed in the next sub-section, will provide some motivation to achieve the goals desired by government, but the true enabler here is the model of contracts that are based on a Firm Fixed price model per utilization rate. This should be the ultimate goal of contracts that show enough maturity that costs, risks and program support elements are well understood. This has clearly become the goal for the contractual support strategies directed by the US DoD,⁸⁸ the Australian MoD⁸⁹ and the Canadian DND⁹⁰ as stipulated in their guidance documentation. To put this into perspective, the average savings of PBL contracts as studied by Boyce and Banghart (2012) in comparison to traditional contracting methods is between 10-20%⁹¹ and is really only limited by initiative, creativity and opportunity. In comparison, the Industry average for implementing performance incentive bonuses are typically set between 1-5 % of the contract value.⁹² Despite these advantages of FFP models there remains many legacy systems whose support contracts are renewed in purported performance based formats that fall short of fully utilizing the advantages available. For instance in Canada there is a distinct difference in philosophy between the application of PBC's for legacy fleets (OWSM) and new fleets (ISSCF). Policy clearly directs ISSCF contracts to be long term, performance based and FFP where possible, however this requirement does not exist for legacy fleets. Under the OWSM guidelines for legacy fleets the only performance requirement is the application of performance incentives. This is counter-intuitive when considered against the ample availability of historical cost and performance data that exists for these legacy fleets.

⁸⁷ Interview with Jim Miller, Vice President Standard Aero Limited, Feb 2013

⁸⁸ Defense Acquisition University, PBL: A Program Manager's Product Support Guide, Mar 2005.

⁸⁹ Australian DoD, PPBC Handbook, Jun 2011

⁹⁰ Canadian Forces, DAOD 3022-1, Management of Procurement of In-Service Support for CF Platforms, Aug 2010.

⁹¹ Boyce J. and Banghart A., Performance Based Logistics and Project Proof Point, Defense AT&L Project Support Issue, March-April 2012 p. 30.

⁹² Interview with Steve Geary, Supply Chain Visions, 2 Jan 2013

Recommendations

By far the most motivating aspect of a PBC is the ability for the contractor to realize unlimited profits when working under a firm fixed price model. Wherever possible and supported with mature system data, contracting authorities should target a FFP basis of payment. For legacy, mature systems with sufficient cost and performance data, transition to FFP should be achievable immediately on contract recompetition or renegotiation, for new system support requirements the level of complexity in trying to accurately assess cost figures and risk/reward trade-offs could lead to inaccuracies and greater risk. For this reason early in the implementation of the new product support (1-3 years) should be based on a cost plus pricing scheme with a few top level simple to assess performance metrics. Upon stabilization of the cost and performance data transition to a fixed price per usage rate should be targeted.

4.4.2. Incentivization

An essential element of PBCs is appropriate and effective incentivization. This is mandated in the US by FAR Part 37, in Canada by the Defence Admin Orders and Directives (DAOD) 3022-1, and in Australia by their PPBC handbook. When done properly, these incentives should promote behaviours and outcomes that benefit both the customer and supplier.⁹³ These incentives can take several forms, and really require the contracting team to well understand the program, environment, industry and opportunities for success. Getting the incentives wrong can result in a change in focus of the contractor onto elements that are not necessarily in the best interest of the customer. The most common types of incentivization are: performance awards (bonuses or penalties), contract award terms, cost sharing (both positive and negative, sometimes referred to as sharing the pain and sharing the gain) and past performance ratings (typically in the US).⁹⁴

Performance award payments or penalties are a common incentive mechanism within PBC contracting and represent either a performance bonus for achieving set performance levels, evaluated against set metrics, or alternatively a performance penalty for not meeting these given metrics. In general, defence and industry experience have shown that these performance levels need to be achievable and clearly within the scope of authority or control of the contractor and be designed to be simple, objective, top-level and few in number. The most commonly applied top level metrics are: availability, reliability, maintainability and cost (where the contract is not already FFP). Keeping the metrics at a high level will enable creativity and flexibility from the contractor. Too many metrics at too low level risk to dilute the award fee and effectively results in the customer prescribing how a contractor is to achieve the task assigned, removing the ability for them to use ingenuity and expertise in accomplishing the desired goal in the best possible manner.⁹⁵ One anecdote from industry⁹⁶ involved a highly successful program with award incentives applied to a contract for a total value of 5% of the contract value. This award fee was distributed across 10 performance factors and resulted in each metric being diluted to 0.5% of the contract value. The individual importance of each factor was lost at this point and the risk of driving the contractor to unexpected or unachieved results rose.

Another method of incentivization that can result in very positive results can be realized in the form of award terms, which are basically contract extensions. The concept here

⁹³ Vitasek K. and Geary S., A Rose by any Other Name: The Tenets of PBL, Nov 2008.

⁹⁴ Ibid.

⁹⁵ Interview with Jerry Cothran, Lockheed Martin Corporation, 4 Jan 2013

⁹⁶ Interview with Steve Geary, Supply Chain Visions, 2 Jan 2013.

is that industry is often more deeply motivated by continuing contracts than by a limited performance bonus.⁹⁷ The Australian MoD cites the principle aim of award terms as a longer term incentive rewarded for achieving cost reductions while also continuing to achieve performance requirements, however to be aware that award terms can only be effectively applied where there is a competitive market where there is a credible opportunity to re-compete the contract.⁹⁸ There is considerable value to a contractor to maintain an ongoing contract while avoiding costly rebid efforts and the risk of losing the contract in a competitive market. Equally from the customer's point of view re-competing a contract represents typically a two year effort through a complex bureaucratic process that may be faced with personnel changes, budget constraints or regulatory challenges. Award terms applied through successfully meeting the cost and performance requirements can therefore be very mutually interesting for both the contractor and the customer.

Cost sharing, sometimes called gain sharing, can be achieved in a number of different methods, but in general results in a sharing of savings between the contractor and the customer realized through the contractor's performance. In a cost plus incentive format this may be applied in additional profit built into the fee arrangements of the contract⁹⁹, whereas in a FFP style contract, program savings would immediately be seen as profit for the contractor, and the customer would realize the savings in the form of price decreases calculated at set reassessment periods or follow-on contracts (fig. 4). These periods of reassessment therefore become essential in extended long-term contracts, that will allow for cost rebaselining. A balance needs to be achieved here with the aim at incentivizing the contractor to invest resources and money proactively in order to reduce program support costs and realize increased profit. This balance when done correctly will allow the contractor sufficient time to achieve a return on investment, while also giving the government an opportunity to reassess progress and share in the program savings. Industry standards for this ROI period is frequently set at 3-5 years¹⁰⁰, in the US, several examples of recent contracts are being based on a 5 year base period with 5 years of optional extensions,¹⁰¹ in Canada, the UK and Australia longer year contracts are being established, some between 20-30 years, but with built in reassessment periods, also typically done every 3-5 years. It is important to note (and avoid in the future) that in an environment of over-emphasis on contractor profit, government has in the past desired the option of renegotiating contract price annually, which has effectively removed any contractor incentive to invest in cost reductions.¹⁰²

Recommendations

Recognizing that a one-size fits all scenario doesn't exist, fully explore implementation strategies to develop the best value for money scenario that will achieve the most effective performance result from the warfighters perspective based on individual program requirements and tailor the approach in accordance to these findings. The results of this study (typically included in a robust BCA) should make the best incentivization strategy clear, and a balance of the incentivization techniques of performance awards, contract award terms and cost sharing should be implemented where evaluated to have the greatest effect. Recognize that often times a contractor may be more heavily motivated to achieve a contract extension rather than a marginal performance award, especially if the level of effort required to achieve that performance

⁹⁷ Interview with Gerald Tonoff, Defense Logistics Agency (DLA) - Civilian Human Resources, 9 Jan 2013.

⁹⁸ Australian DoD, PPBC Handbook, Jun 2011

⁹⁹ Ibid.

¹⁰⁰ Vitasek K. and Geary S., A Rose by any Other Name: The Tenets of PBL, Nov 2008.

¹⁰¹ Interview with Jerry Cothran, Lockheed Martin Corporation, 4 Jan 2013.

¹⁰² Ibid.

award is high or in the event that in achieving the award bonus another aspect of their profit margin is affected negatively.

4.5. Off-Ramps

PBC contracts should include adequate exit criteria in the event that the relationship between the contractor and the government is terminated.¹⁰³ Lessons learned from both Canada and Australia show that the ability to terminate the contract whether for non-performance or other unforeseen eventuality needs to be a credible and achievable possibility. To enable this, contract terms and conditions need to adequately identify all data, IP, licensing, support/tooling equipment requirements to allow for follow-on contracting.¹⁰⁴

Recommendation

Build sufficient detail into the contract terms and conditions to clearly identify when the contract may be terminated and also identify the necessary criteria that will allow the government to continue with another contractor or organically if required.

4.6. Transparency

PBC is a very data intense environment, accurate data is required in order to appropriately set and assess achievement of performance metrics, calculate ongoing cost modelling and to fully understand technical and cost drivers built into a given program. This data is also necessary to ensure a smart buyer capability: meaning to retain the in-house expertise to assess value for money and claims from contractors when dealing with technical, logistics or programmatic issues associated within a given contract.¹⁰⁵ This transparency will remove doubt or ambiguity in the business transactions and foster a trust relationship and greater degree of accountability within the program and allow the government as a client to understand what is driving costs and therefore how best they can support industry and incentivize/reward them to reduce these costs.¹⁰⁶ Typically the in-depth knowledge required to understand what is driving costs is best achieved by the people who hold the most technical knowledge and the day to day transactional knowledge of the contract work. It is not surprising then that this is likely the contractor that knows these details best. To achieve real transparency, where the contractor shares the knowledge of the cost drivers there must be a great deal of trust that this information will not be used against them in driving down their bottom line and therefore their profits. Government contract manager's typically upon learning of potential cost savings will try to take immediate advantage of them at the expense of the contractor in a zero sum gain approach (Government wins, contractor loses), this does not foster a transparent environment and does not encourage cost decreases or performance increases. There have been recent examples of PBCs where the government has included contract language requiring annual contractor provision of cost data on fixed price contracts, which could lead to annual price renegotiations potentially removing or reducing incentives for the contractor to invest in process changes to increase efficiency.¹⁰⁷ The section on incentivization covers some mechanisms to encourage collaboration, but the key here to transparency is trust between the

¹⁰³ Vitasek K. and Geary S., A Rose by any Other Name: The Tenets of PBL, Nov 2008.

¹⁰⁴ Canadian Forces, Directorate of Aerospace Equipment Program Management, OWSS and ISCF Lessons Learned, June 2012; Australian DoD, PPBC Handbook, Jun 2011

¹⁰⁵ Canadian Forces, DAOD 3022-1, Management of Procurement of In-Service Support for CF Platforms, Aug 2010.

¹⁰⁶ Interview with Jim Miller, Vice President Standard Aero Limited, 2 Dec 2012.

¹⁰⁷ Interview with Jerry Cothran, Lockheed Martin Corporation, 4 Jan 2013.

contractor and the client and a true understanding that an adversarial approach will never achieve optimum results.

Recommendations

Establish an automated, robust electronic system for capturing data required for assessing the performance metrics (typically involves availability and reliability data) that is irrefutable.¹⁰⁸ Embed incentivization methods outlined in section 4.4 that are robust and motivate the contracts by allowing their profits to rise. Recognize that by not fully understanding the cost drivers it is impossible to fully understand the contractors motivations and as such, although performance metric awards and cost sharing along the lines of VECP's may have some success in rewarding the right type of actions from a government approach, there may be competing trade-offs in value to these approaches from a contractor's perspective. A FFP approach to the contract as recommended in section 4.4.1 is the most effective manner to motivate and protect the contractor's profits, additionally when done correctly it will foster an environment that encourages trust and transparency in this critical relationship.

4.7. System, Sub-System or Component Level Relationship

In their study Project Proof Point, Boyce and Banghart state that PBL contracts are equally effective regardless of whether they are applied to the system, sub-system or component level,¹⁰⁹ but there are many nuances in this statement. Industry experience has shown that PBL is ideal for system-level contracts where it can ensure the ultimate warfighter needs without risk of being sub-optimized through lower level independent contracts,¹¹⁰ however experience within the US Navy has shown that due to technical and financial complexity, platform-level PBLs are very difficult to achieve and that subsystem and component level PBLs can be more easily managed, are more potentially cost effective and have worked best for the NAE.¹¹¹ So the definitive answer on what level of a program to target is: ... it depends. The key is that when contracting for ingenuity and creativity aimed at improving cost and performance metrics it is essential that the contractor holds or can leverage the knowledgebase to be able to drive design change, process change and in depth system knowledge (including a relationship with suppliers and a deep understanding of inherent reliability issues) and in applying this ingenuity they will be rewarded for their investment. The further removed from a direct relationship with the holder of this knowledge, the less likely the government will be able to incentivise their increased performance. There is no universally right answer here, but a thorough review of all these elements is essential prior to selecting a contract strategy. Complex major sub-systems (airframe, aero-engine, avionics and landing gear) are often separated to remove risk and thereby contingency added by prime contractors to compensate for limited control.¹¹²

Recommendations

Target opportunities of highest potential impact, either the largest savings, greatest increases in availability or easiest to achieve. In terms of effort to achieve, the sub-system or component level is likely an easier target than an entire weapon system to first negotiate terms with and secondly to fully harness the ingenuity of the service

¹⁰⁸ Beland P. and Hollick L., Achieving Organizational Accountability for Aircraft Operational Availability - Systems Engineering and Contracting Strategies in the Canadian Forces, 2006 p. 3.1-17

¹⁰⁸ Boyce J. and Banghart A., Performance Based Logistics and Project Proof Point, Defense AT&L Project Support Issue, March-April 2012 p. 30.

¹⁰⁹ Ibid.

¹¹⁰ Interview with Jerry Cothran, Lockheed Martin Corporation, 4 Jan 2013.

¹¹¹ Dunaway D.A., Performance Based Logistics Guidance and Best Practices Memorandum, April 2012

¹¹² Australian DoD, PPBC Handbook, Jun 2011

provider. The owner of the intellectual property or intricate support knowledge is the most likely to achieve success with process improvements, redesign, or technical ingenuity, be it R&D investment opportunities, product rework or supply chain optimization. The further removed from the holder of this knowledge, the less likely it will be that they can achieve significant optimization and the more difficult the contract negotiations will become.¹¹³ Large changes in scope to a contractor's historical responsibility may be very difficult to develop costing for and will likely result in either resistance from the contractor or large risk factors due to uncertainty of relationships with subcontractors, and reluctance to aggressively target performance metrics. Incremental evolution of contracts aimed at easily achieved changes, largely based on known data will keep perceived risk lower and facilitate quicker contract negotiations which in turn will allow both the government and the contractor to gain experience in PBC's, take immediate advantage of performance and cost savings and will facilitate deeper transitions with time and experience.

¹¹³ Interview with Steve Geary, Supply Chain Visions, 2 Jan 2013.

5. Conclusion

Performance Based Contracting has shown concrete results when appropriately applied across the countries studied during benchmarking. Although often times reported results can be based on emotion and individual bias, recent thorough and statistically sound investigations have shown impressive results, especially when the guiding recommendations garnered from lessons learned are followed. The annual equipment maintenance costs of the combined 5 countries studied in this paper, represent approximately \$100 Billion, these costs will likely increase as newer more sophisticated material is acquired to replace aging equipment. The best studies available conclude that an expected performance improvement of between 20-40% and cost savings of between 10-20% have been realized when using PBCs in comparison to traditional time and material contracts. These figures and opportunities cannot be ignored.

Governments need to fully embrace the benefits of aligned motivation that can be achieved in the win-win scenarios represented by PBC models. There is a clear preference within the governments studied in this paper to employ PBCs, however some countries are not aggressively pursuing the full advantages available in PBC's especially with respect to firm fixed price contracts based on usage rate or are only applying these concepts on new equipment support contracts. These contracting strategies must also be implemented on existing legacy equipment where supported by detailed analysis taking advantage of known cost and performance data. Further exploration of these contracts should be carried out and certainly government contracting offices need to invest time and resources into further improving the expertise of the defence personnel involved and really drive to achieve and improve on the results that have been realized by best practices to date.

It is also imperative that governments continue to invest resources in maintaining a smart buyer capability; retaining expertise and essential skillsets within defence organisations. Each individual program needs to be evaluated on its own merits and program support structures need to be tailored specifically according to the individual requirements of that program based on a detailed analysis (typically a business case analysis).

The challenges that continue to face successful implementation of PBC are departmental culture, government and contractor training and experience, program maturity including accurate cost and performance data, limiting government policy and legislation, complexity of contract negotiations, lack of government team capacity, and funding uncertainty. All of these have been to some extent successfully overcome in past experiences by the five studied nations. Rather than seeing any of these challenges as definitive roadblocks, implementation teams need to accurately assess the challenges and systematically address the concerns in order to facilitate a comprehensive team approach motivated to achieve the best results possible.

The keys to achieving success with PBC are to start with a clear, fully communicated top level vision, invest efforts to ensure complete government and industry buy-in to the support strategy, strive to achieve highly integrated alignment of motivation through application of the most appropriate contract mechanisms and effective incentivization methods, employ clearly defined off-ramps when contract termination may be necessary and accurately assess the most effective level of contract implementation (system, sub-system or component) individually selected per program.

6. References

1. Documents

- Air Force Instruction 63-101/20-101, Integrated Life Cycle Management, 07 Mar 2013.
- Australian DoD, PBC Handbook (version 2), Feb 2007.
- Australian DoD, PPBC Handbook, Jun 2011.
- Australian Defence Material Organisation, Next Generation Performance-Based Support Contracts - Achieving the Outcomes that Defence Requires, Feb 2010
- Auditor General of Canada Fall report 2010, Chapter 6: Acquisition of Military Helicopters
- Auditor General of Canada Fall report 2011, Chapter 5: Maintaining and Repairing Military Equipment - National Defence
- Beland P. and Hollick L., Achieving Organizational Accountability for Aircraft Operational Availability - Systems Engineering and Contracting Strategies in the Canadian Forces, Oct 2006
- Boyce J. and Banghart A., Performance Based Logistics and Project Proof Point, A Study of PBL Effectiveness, Defense AT&L Project Support Issue, March-April 2012
- Canadian Forces, DAOD 3022-1, Management of Procurement of In-Service Support for CF Platforms, Aug 2010
- Canadian Forces, Directorate of Aerospace Equipment Program Management, OWSS and ISCFE Lessons Learned, June 2012
- Defense Acquisition University Press, Performance Based Logistics: A Program Manager's Product Support Guide, March 2005
- Deloitte, Through Life Capability Management - Enabling Effective and Efficient Acquisition and Support of Defence Capability, 2010
- Edison T. and Murphy A., A New Look at Enablers and Barriers to Performance Based Life Cycle Product Support (PBL) Implementation, Defense ARJ, Oct 2012 Vol 19 No. 4: 376-393
- Foster R., In Service Support Contracting in the Canadian Forces, April 2007
- Fowler R., Misunderstood Superheroes, Batman and Performance Based Logistics, Defense AT&L: Jan-Feb 2009
- Gansler J. and Lucyshyn W., Evaluation of Performance Based Logistics, University of Maryland, August 2006
- Giguere S., Power Point presentation to Director General Aerospace Equipment Program Management, 13 Jan 2013
- Goure D., Back to the Future, The Perils of Insourcing, The Lexington Institute.
- Goure D., Performance Based Logistics: A Primer for the New Administration, 25 April 2009
- Kobren B., What Performance Based Logistics is and What it is Not and What it Can and Cannot Do, DAU, 2009
- Mahon D., Performance Based Logistics: Transforming Sustainment, 2007
- United Kingdom Defence Standard, DEF STAN 00-600 Issue 1, Integrated Logistics Support. Requirements for MOD Projects, April 2010
- United Kingdom MoD, Defence Strategy for Acquisition Reform, Feb 2010
- United Kingdom MoD, The New Operating Model - How Defence Works, Dec 2012

US Department of the Navy Performance Based Logistics Guidance Document
Memorandum Jan 27, 2003

US Department of the Navy, PBL Guidance and Best Practices Memo, 03 Dec
2012

Vitasek K. and Geary S., A Rose by any Other Name: The Tenets of PBL, Nov
2008

Vitasek K. and Geary S., Performance Based Logistics Redefines Department of
Defense Procurement, 2008

Waldock D., The Use of Performance-Based Service Acquisition within the
Department of National Defence, 2009

2. Internet Sites

Defense Acquisition University (DAU): <http://www.dau.mil/default.aspx>

The White House, Best Practices for Performance Based Contracting:

http://www.whitehouse.gov/omb/procurement_guide_pbsc

Australian Defence Material Organisation:

<http://www.defence.gov.au/dmo/index.cfm>

3. Interviews

Clive Murgatroyd, Lecturer at the Defence Academy of the United Kingdom, 5
Feb 2013

Gerry Tonoff, Defense Logistics Association (DLA) - Civ Human Resources, 9 Jan
2013

Jim Miller, Vice President Standard Aero Limited, 2 Dec 2012

Jerry Cothran, Lockheed Martin Corporation, 4 Jan 2013

LtCol Alain Rodelet, Belgian Defence Force, MRMP-A/S, 22 Jan 2013

Major Baudouin Heuninckx, Belgian Defence Force, MRMP-A/P, 10 Jan 2013

Serge Mongeon, Project Management Office (Chinook), Canadian Department of
National Defence, 01 Jan 2013

Steve Geary, Supply Chain Visions, 2 Jan 2013