



PBL GUIDEBOOK

A Guide to Developing Performance-Based Arrangements



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PREFACE

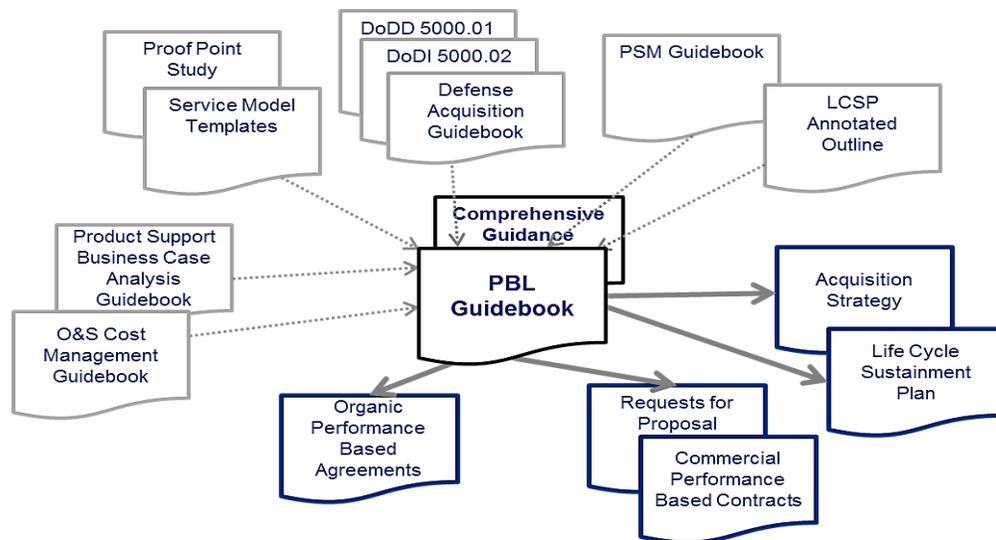
The 2016 Release of the PBL Guidebook includes additional lessons learned and implementation guidance intended to support a Program Management Team through the development and execution of PBL arrangements. It is an update to the 2014 Release. Additions to the 2016 Release are as follows:

1. Updated Frequently Asked Questions and a review of common myths surrounding Performance Based Logistics.
2. New material addressing intellectual property issues, highlighting various strategic considerations surrounding government data rights.
3. Refined data collection phase focused on program specific insights generated through analysis.
4. Additional appendix highlighting specific considerations and steps a Program Management Team should address prior to beginning the implementation process.

Throughout the document, key insights for success were included leveraging the experiences and lessons learned from ongoing PBL initiatives. Overall, the edits and enhancements are intended to improve the usability of the guidebook and maintain updated content for the successful implementation of PBL arrangements.

Introduction

The Under Secretary of Defense for Acquisition, Technology, and Logistics’ Better Buying Power (BBP) initiatives identify seven focus areas to achieve greater efficiency and productivity in defense spending. Based on proven success, Performance-Based Logistics (PBL) is included within the BBP initiatives area three – “Incentivize Productivity and Innovation in Industry and Government.” The BBP initiatives emphasize that delivering better value to the taxpayer and Warfighter is the goal. In support of these initiatives, the Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness (OASD (L&MR)), in collaboration with the Services and Defense Acquisition University (DAU), prepared this PBL Guidebook. This document is for Component Leadership, Program Executive Officers (PEO), Program Managers (PM), Product Support Managers (PSM), Logistics Managers, Contracting Officers, Financial Managers, System Engineers, and other parties responsible for developing and executing product support strategies. It is a consolidated resource that leverages Department of Defense Instructions (DoDI) and other guidebooks, and uses the Product Support Business Model as an organizing construct for PBL best practices, processes, and supporting documentation needed to craft effective PBL arrangements.



How to Use This Document

This Guidebook is divided into three major sections, each with various subsections. Section One provides background information that addresses the history of PBL, how it works, and considerations for its application across the various phases of a program’s life cycle. Section Two complements and expands upon the DoD 12-Step Product Support Strategy Process Model provided in the PSM Guidebook for systems, subsystems, or components. The steps in Section Two are intended to assist the reader in successfully implementing a PBL arrangement with the recognition that, depending on the life cycle phase, not all steps may be applicable and all are tailorable depending on the unique requirements of a given program. Section Three is the appendices. This document provides hardware-focused examples, but the steps in this document may also be applied to Major Automated Information System (MAIS) programs. As an example for the reader to follow in developing and implementing a PBL arrangement, a notional Generic

Subsystem (GSS) (that implements a PBL solution with a commercial Original Equipment Manufacturer (OEM)) is included throughout the Guidebook.

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1. Background

1.1. PBL Defined

PBL is synonymous with performance-based life cycle product support, where outcomes are acquired through performance-based arrangements that deliver Warfighter requirements and incentivize product support providers to reduce costs through innovation. These arrangements are contracts with industry or intragovernmental agreements.¹

A PBL arrangement is not synonymous with Contractor Logistics Support (CLS). CLS signifies the “who” of providing support, not the “how” of the business model. CLS is support provided by a contractor, whether the arrangement is structured around Warfighter outcomes with associated incentives or not. PBL arrangements, on the other hand, are tied to Warfighter outcomes and integrate the various product support activities (e.g., supply support, sustaining engineering, maintenance, etc.) of the supply chain with appropriate incentives and metrics. In addition, PBL focuses on combining best practices of both Government and industry.

1.2. Policy and Guidance Overview

PBL has been the preferred sustainment strategy since the 2001 Quadrennial Defense Review (QDR) stating, “DoD will implement PBL to compress the supply chain and improve readiness for major weapons systems and commodities.” Since then, it has been both DoD policy² and a strategic priority to increase the use of performance-based arrangements to deliver product support solutions³ that satisfy Warfighter requirements.

The policies governing these strategies have gone through several iterations since 2001, but the intent has remained the same: to provide life cycle product support that delivers needed reliability and availability at a reduced cost while complying with directives, such as inventory accountability within a Government Accountable Property System of Record, and maximizing the use of existing Government-owned inventory when purchasing through a PBL. A detailed listing of the Product Support and PBL policies, guidance, and tools can be found at: <https://acc.dau.mil/productsupport> and <https://acc.dau.mil/pbl>.

1.2.1. Performance Based Contracting (Arrangements)

As outlined in the Federal Acquisition Regulation (FAR) Subpart 37.6 – Performance Based Contracting (PBC). PBC is a contracting method intended to ensure required performance quality levels are achieved, and total payment is related to, the degree to which performance meets contract standards. To obtain these objectives, performance based contracts should:

- Describe requirements in terms of results to be obtained rather than the methods of performance. In other words the task should describe the desired result or outcome rather than how work is to be performed.

¹ PBL description from the ASD L&MR “Performance-Based Logistics Comprehensive Guidance” Memorandum DTD 22 Nov 13

² DoDI 5000.02

³ A product support solution is the implementation of a product support strategy

- Use measurable performance standards (in terms of quality, timeliness, quantity, etc.). Ideally these standards should be expressed in objective measures using indicators such that the performance measure is achievable and independently verifiable.
- Specify procedures for reductions of fee for a cost type contract or reductions to the price of a fixed price contract when services are not performed or do not meet contract requirements. These financial penalties provide incentives for satisfactory contract performance according to the desired outcome and performance standards. Include performance incentives where appropriate. Unlike financial penalties for failing to meet performance standards, an incentive feature would reward the contractor for any efforts to perform above the standard or contractor investments in innovative approaches resulting in performance that surpasses the standard. This can be accomplished by means of incentive fees that provide a financial reward for superior performance or incentive terms whereby the government agrees to exercise option periods based on attaining predetermined levels of performance.

By way of example, a performance based contract consisting of five base years with five additional one year options might require a vendor to maintain a first pass material availability rate of 90 percent (desired outcome). The performance standard would be measured by the number of occurrences where material is provided on the first pass as expressed in terms of a percentage (objective performance measure). If first pass material availability falls below 90 percent, the contractor incurs financial penalties (reduction in fee or price). If, on the other hand, first pass material availability stays above 90 percent for three straight years, the government agrees to exercise an option year (performance incentive).

1.3. History of PBL

1.3.1. PBL in Commercial Industry

System and subsystem⁴ PBL strategies have been around for many years in commercial aviation. In these strategies, often referred to as “Power by the Hour,⁵” the customer pays the Product Support Provider (PSP) for a specified target level (system, subsystem, or component) of availability; this availability is measured as a percent value or the number of hours in an operational period, and the payment is based on usage. The provider incurs whatever costs are necessary to deliver the specified performance outcome. Similar strategies were successfully implemented in the heavy construction equipment sector. As the DoD considered the merits of adopting PBL, it determined the practices proven in commercial aviation were extensible to a broad range of hardware and software-intensive weapons systems.

1.3.2. PBL Origins in DoD

PBL in DoD can be traced back to 1999, specifically to a collaborative approach adopted by Lockheed Martin and the Air Force to deliver support for the F-117 Nighthawk stealth ground-attack aircraft after the Base Realignment and Closure (BRAC) of the Sacramento Air Logistics Center (Geary & Vitasek, 2008). The Services originally implemented PBL to improve

⁴ System, subsystem, and component definitions can be found in the PSM Guidebook at <https://acc.dau.mil/psm-guidebook>

⁵Rolls-Royce Corporation

system readiness. More recently, PBL has been implemented to deliver needed reliability and availability, reduce total cost, and encourage and reward innovative cost reduction initiatives.

1.3.3. An Analysis of PBL Effectiveness

ASD (L&MR) chartered a study in the fall of 2010 to analyze the impact of PBL on Life Cycle Costs (LCC), as compared to non-PBL sustainment arrangements. The “Proof Point” study⁶ concluded that, when properly structured⁷ and executed, PBL arrangements reduce the Services’ cost per unit-of-performance while simultaneously driving up system, subsystem, or component readiness. The study further estimated that an average annual cost savings or avoidance of 5-20 percent is possible for programs with generally sound adherence to the PBL tenets. As with any complex acquisition and/or sustainment strategy, there are certain desired characteristics necessary to drive optimal outcomes. For PBL, these characteristics are commonly referred to as the “tenets” of PBL. In Table 1, the Tenets of PBL are shown.

Tenets of PBL	Description
Tenets Tied to Arrangements	<ol style="list-style-type: none"> 1. Acquire clearly defined Warfighter-relevant outcomes, not just sustainment services or replacement equipment 2. Use measurable and manageable metrics that accurately assess the product support provider’s performance against delivery of targeted Warfighter outcomes 3. Provide significant incentives to the support provider that are tied to the achievement of the outcomes (for aspects of performance that are within their control) 4. Firm Fixed Price (FFP) contracts are generally the preferred contract type (Fixed Price Incentive Firm (FPIF) and Cost Plus Incentive Fee (CPIF) may be effective) 5. Provide sufficient contract length for the product support provider to recoup investments on improved product (e.g., Mean Time Between Failure (MTBF) and sustainment processes (e.g., manufacturing capabilities)
Tenets Tied to Organization	<ol style="list-style-type: none"> 6. PBL knowledge and resources are maintained for the Government team and product support providers 7. Leadership champions the effort throughout their organization(s) 8. Everyone with a vested interest in the outcome is involved 9. Supply chain activities are aligned to the desired PBL outcome versus disparate internal goals 10. Risk management is shared between the Government, customer, and support provider

Table 1: Tenets of PBL⁸

Table 2 and Figure 1 display the empirical findings from the “Proof Point” study, providing compelling evidence of the impact of performance-based sustainment on both cost and performance.

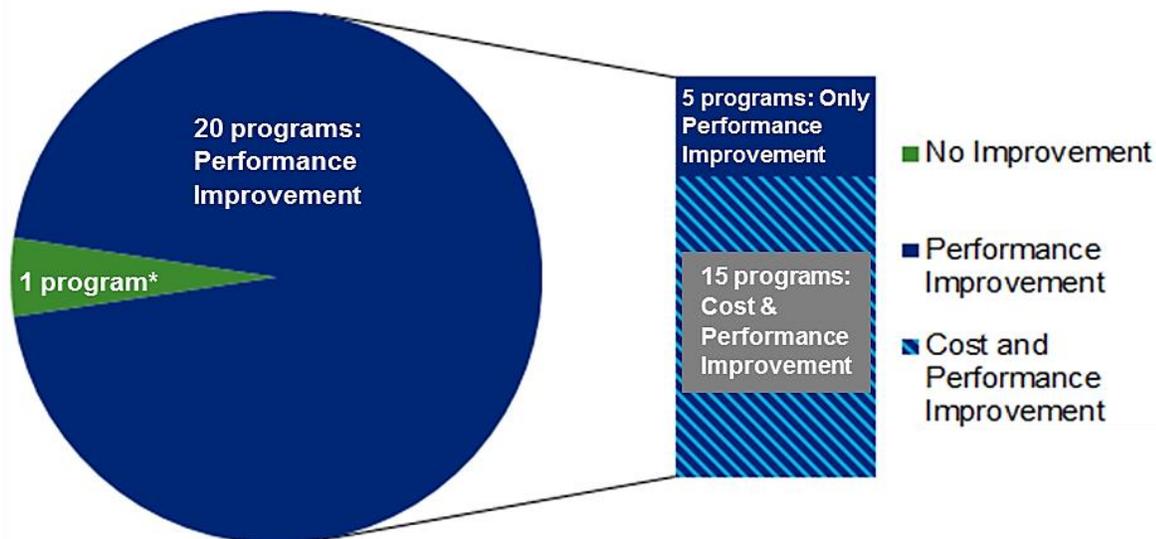
⁶ “Proof Point” PBL Study summary and briefing slides can be found at: <https://acc.dau.mil/CommunityBrowser.aspx?id=550259&lang=en-US>

⁷ “Properly structured” refers to alignment with the PBL tenets

⁸Based on original research done by the University of Tennessee for USAF. See Appendix A for additional information.

Empirical Findings
<ul style="list-style-type: none"> • Twenty of 21 programs studied experienced performance improvements, including three with very limited adherence to the generally accepted PBL tenets. <ul style="list-style-type: none"> ○ The 21st program’s declining performance resulted from a part failing more than it was forecast; this situation was unrelated to the PBL arrangement and would have occurred in a non-PBL arrangement as well.
<ul style="list-style-type: none"> • Of the 21 programs, 15 programs had tenet adherence (where the cost impact was determinable with certainty) and experienced both cost and performance improvements.
<ul style="list-style-type: none"> • Three programs with very limited tenet adherence experienced cost increases. <ul style="list-style-type: none"> ○ None of the three programs were structured to deliver savings.

Table 2: Empirical Findings



**program performance was NOT related to the PBL arrangement.*

Figure 1: Proof Point Results

This empirical evidence provides a compelling case that performance-based sustainment is both a successful and robust strategy. Realizing both cost and performance savings requires a program to achieve only moderate tenet adherence. For the programs with moderate tenet adherence, savings ranged from the low single digits to 27 percent. In general, the stronger the tenet adherence, the greater savings realized. These facts support the estimated 5–20 percent savings (or cost avoidance) range. The empirical evidence also illustrates that calling an arrangement “performance-based” in the absence of moderate adherence to the tenets will not guarantee success.

PBL arrangements also contribute to other cost avoidance effects not quantified in the study's findings. For example, one program determined that with the higher platform availability of its PBL-maintained aircraft, it could reduce the number of required aircraft, resulting in a 10 percent decrease in procurement costs and a savings of hundreds of millions of dollars. Another program avoided almost a billion-dollar depot facilitation cost through a PBL arrangement by utilizing existing commercial capability versus establishing public sector facilities.⁹ Another program experienced a dramatic decline in cannibalizations, duplicate ordering, and more expensive transportation modes, as its subsystem availability approached 100 percent after PBL implementation.

The study—through its quantifiable and non-quantifiable results—demonstrates that performance-based product support strategies contribute to cost savings for DoD when structured and executed properly. There are examples of past PBL arrangements that did not deliver the anticipated cost or availability improvements, but these PBLs were the result of poor execution, rather than an indication of a flaw in the PBL plan. In sum, performance-based product support strategies that are properly managed deliver cost and availability improvements within the DoD environment.

1.4. How Performance-Based Arrangements Work

The PBL strategy works by incentivizing desired outcomes across the product life cycle, from design through sustainment to retirement. Those individuals responsible for designing the system, crafting the strategy, and fulfilling the requirement must have an understanding of the business model and the perspectives of the Warfighter and the provider.

Under the traditional transactional product support model, where the Government purchases parts or maintenance services from a commercial PSP (Contractor) when a repair is needed, the Contractor is not incentivized to reduce the need for repairs and repair parts. When equipment fails or is overhauled, the provider charges the Services for repair or replacement on a transaction-by-transaction basis. With transactional sustainment, the provider's revenue and workload increase as equipment failures increase. This model creates a fundamental product support misalignment for DoD; PBL arrangements address this misalignment. When commercial providers are paid for performance, not per transaction, their profits are directly impacted in a negative way by any additional costs they incur in delivering contractual requirements. In a PBL arrangement, a commercial provider is incentivized to reduce both the number of repairs and the cost of the parts and labor used in the repair process. Commercial providers are incentivized to reduce system downtime in PBL arrangements because the contract specifies it or their profit is increased by reducing their cost.

Public providers respond to a different set of incentives than commercial industry. While commercial industry is driven by profit, Return on Invested Capital (ROIC), and a guaranteed revenue stream, public providers are driven by increased workload and additional labor at the depots. However, since Program Offices (PO) also like to see a decrease in required repairs (i.e., work), the incentives must be established to satisfy both of these goals. Monetary incentives for shop performance may be used; however, the funds must come from the organic Command as

⁹ Avoidance of depot facilitation may not be possible if required by 10 USC 2464 Core repair capability

the OEM Product Support Integrator (PSI) is prohibited from bonuses or other monetary incentives to the public PSP as part of a Public Private Partnership (PPP).

1.4.1. Industry is Driven by Profit, Return on Invested Capital, Long-Term Revenue Stream, and Risk

When the PSI or PSP is a commercial business, it is important to understand the factors that influence and motivate its behavior. Industry, accountable to shareholders, competes to provide goods and services in the marketplace, balancing business risks and the potential for profit with providing a sound return on investment to shareholders. Since a strong business relationship is one of the foundational elements of successful performance-based arrangements, it is important to understand how industry works from a corporate and individual perspective. This understanding will facilitate the development of incentives that will best motivate the necessary behaviors for desired performance outcomes.

As the owners and originators of DoD sustainment arrangements, the Services have significant, often exclusive, control over where the work is performed. It is important to note that transitioning to a PBL arrangement with a commercial business does not automatically result in all work being performed by the commercial provider. Options for where work may be performed when transitioning to a PBL arrangement include, but are not limited to:

- Work previously performed at a Government activity continues to be performed by Government workers
- Work previously performed at a Government activity is transitioned to a commercial repair facility
- Work previously performed in a commercial activity transitions to a Government activity
- Work previously performed in a commercial activity continues to be performed by the commercial provider
- The work previously split between a Government and commercial activity is realigned according to the provisions of the PBL arrangement

As noted above, transitioning to a PBL arrangement can result in the Government making a deliberate decision to award a contract to a commercial provider where touch labor is moved to the commercial provider. It can also result in repair work currently being performed by a commercial provider being transitioned to a Government activity.

Depending on the circumstances, outsourcing maintenance work to a commercial entity may be the right answer for the Warfighter, military service, taxpayer, and commercial company. Often, however, transitioning work to the commercial PBL provider is not the right answer for the aforementioned entities. Understanding why and when having the commercial PBL provider execute all work may not be the optimal solution requires an understanding of the business goals commercial firms attempt to optimize. Table 3 below highlights three key goals commercial businesses are driven to optimize.

Business Goals Commercial Firms Attempt to Optimize

<p>Profit: The mandate for companies in capitalist economies is to make a profit for its owners (shareholders).</p>
<p>Assured Revenue Streams: In the commercial Aerospace and Defense industry, Wall Street and money markets reward companies with steadily growing or steady revenue over companies with greater variability of revenue, and therefore, greater uncertainty.</p>
<p>Return on Invested Capital (ROIC): A key measure of a commercial firm’s success is the efficiency with which it converts shareholder assets into profit. The fewer capital assets required to generate a given level of profit, the better the ROIC.</p>

Table 3: Commercial Firms’ Business Goals

Understanding that profit and ROIC are core industry behavior drivers is key to understanding where businesses prefer repair work be performed.

Companies optimize their profits by having maintenance and repair work performed where they can get the required level of product quality at the lowest cost. Sometimes quality work can most profitably be performed in the commercial providers’ plants. Sometimes quality work can be most profitably performed in Government activities where labor costs are lower than industry plants. In these cases, the industry PBL providers, through PPP arrangements, outsource touch labor back to the Service.

With respect to ROIC, PPPs also provide industry an opportunity to use Government facilities thereby avoiding the capital investments (i.e., infrastructure) required to perform some or all of the touch labor. PPPs can facilitate higher ROICs for the commercial providers and cause them to leave work in a Government facility or move work performed in a commercial plant into a Government activity. Government benefits from these PPPs because they gain access to industry processes, equipment, and sources of supply, which improves both their capability and capacity.

It is essential that commercial PSIs and PSPs retain the opportunity to realize profitability commensurate with the risks embedded in fixed price-type contracts. These efforts often demand up-front financial investments in reliability, maintainability, and repair process improvements. The commercial PSP needs an appropriate base Period of Performance (Pop) in order to recoup its investment (this will be discussed further in step 10). The magnitude of investment — and consequently, the appropriate Pop — depends upon the scope and complexity of the individual program, as well as the operational environment of the weapon system. Many PBL contracts are implemented on systems, subsystems, or components experiencing declining performance, decreased availability, and/or rising sustainment costs. These trends require proactive action and time to identify, correct, and reverse. A PSI or PSP will assume cost and performance risks to accomplish these objectives, and they may need multiple years to recoup these investments.

Both organic and commercial providers are driven primarily by the mandate to optimize the long-term health of the organization. Commercial providers often strive to optimize long-term revenue and profits; while the organic provider is often motivated to retain workload, capitalize on existing Government infrastructure, and utilize and build upon resident expertise. A long-term arrangement offers industry the certainty and confidence to invest in the system to achieve future savings and offers the organic PSP a business case to invest in infrastructure and workforce

improvements. Opportunities that provide stable revenue streams and consistent workloads are viewed as attractive to both commercial and organic organizations, even though the motivations and benefits may differ. From industry’s point of view, profit targets in a business arrangement are directly related to the level of risk. Business risks take various forms, including technical and financial risks, and incentives that mitigate these risks are appealing. Incentive types include: longer contract lengths that provide time for the PSI/PSP to recoup investments; targeted financial incentives (such as fees) tied to specific, achievable performance outcomes; and optimal award term periods linked to performance.

PBL arrangements are effective under FFP and CPIF contracts. Successful PBL plans have been implemented with CPIF contracts, which may be the more appropriate arrangement when the risk cannot be reasonably quantified or the cost of transferring risk to the PSI or PSP is more than the Government will accept. It is important to note that with cost plus-type arrangements, there is no inherent incentive for the provider to lower their costs since all of their costs are covered and lowering them has no impact on profit. Organic PBLs need to implement Memorandums of Agreement (MOAs) that incorporate appropriate incentives and metrics.

Insights for Success

The key to a successful PBL arrangement is the use of incentives to elicit desired behaviors and outcomes from the PSI/PSP, as a complement to guaranteed cost reimbursement.

Performance-based arrangements provide industry the flexibility to determine how to deliver quality service and performance outcomes for their Government counterparts with an acceptable level of profit and risk. In the context of PBL arrangements, industry will ‘compete’ within their own organization in order to cut costs and increase profit, and will typically do so by:

- Optimizing processes, thereby reducing inefficiency and the associated costs to satisfy a logistics demand
- Improving the quality of the product (e.g., reliability), thereby reducing overall demand and the cost to deliver the desired performance

Both approaches when properly structured and managed will result in reduced cost of support, savings to the DoD, improved supportability for the Warfighter and increased profits to the provider.

1.4.2. Government Motivators and Interests

While Industry is motivated by profit, Return on Invested Capital and assured long term revenue streams, the government has different behavior drivers. One way to think about government sustainment professionals’ motivation is that it is the desire to employ the scarce resources of the American taxpayer in a manner that optimizes the outcome for the warfighter in terms of deterrence and war fighting capability. At a more tactical level, government sustainment professionals attempt to achieve two specific goals: Meet warfighter requirements and do so at the lowest possible cost.

Transactional logistics has historically been successful in enabling the Warfighting capacity required to prevail in the battle space, but almost never at the lowest possible cost.

PBLs enable the Department's realization of both its mission performance and price objectives. However, the Value Proposition PBLs afford the Department extend far beyond performance and cost. PBLs offer the government leverage not otherwise available to effectively: increase the capability, capacity, work flow and workload in its organic depots; improve the organic work force's skill sets; positively influence depot cost recovery rates; improve MTBF; address parts obsolescence and parts non-availability challenges; reduce overall performance and financial risk and transfer significant amounts of the residual risk to industry and realize end-to-end sustainment value chain optimization

1.5. Aligning the Interests of Government and Industry

Because of the nature of the market for weapons systems, both the suppliers and the customers are vulnerable to each other. The contractors depend on the DoD for a substantial portion of their business, while the DoD depends on this specialized group of industry providers (weapons, telecommunications, information, etc.) to support the Warfighters. This relationship is simultaneously cooperative and adversarial. Performance-based product support is successful in this environment because it aligns the interests of Industry and the Government, creating internal competition, motivating Industry to improve their product quality (reliability) and the efficiency of their process to increase their profit, ultimately saving money for the taxpayer while improving support to the Warfighters. The Government's interest is to procure quality products and services at a fair and reasonable price, while Industry is primarily interested in meeting its fiduciary responsibility to shareholders by maximizing profits. In the end, when structured and executed properly, performance-based product support arrangements (PSA) deliver increased or equivalent levels of availability to the Warfighter at lower cost per unit of performance (e.g., cost/operating hour). Further, at contract renewal, a new-cost basis is used to further reduce the cost to the Government, allowing the Government to benefit from the improvements made by the PSI or PSP (when Commercial) in product and process. Industry benefits by keeping the increased profits (either in whole or part) that come from lowering their cost to deliver. Industry also benefits by stabilizing their revenue stream with longer-term arrangements and by leveraging Government facilities/work force versus their own invested capital. A properly structured PBL arrangement accomplishes this by addressing the needs of the Government and balancing them with the needs of the Industry providers within the contract.

1.6. Product Support Business Model and PBL: An Enabling Function across a Program/Product Life Cycle

As stated in the PSM Guidebook, "the PM is assigned Life Cycle Management responsibility and is accountable for the implementation, management, and oversight of all activities associated with development, production, sustainment, and disposal of a system across its life cycle. The PM has the responsibility to develop an appropriate sustainment strategy to achieve effective and affordable operational readiness consistent with the Warfighter resources allocated to that objective." PBL is a strategy for the PM to affordably and effectively satisfy Warfighter

requirements (e.g., reliability, availability) and reduce Operating and Support (O&S) cost. Congress¹⁰ directed a PSM be assigned to each major weapon system to assist the PM with this responsibility. The PSM, a key leadership position in the PO, leads the development, implementation, and top-level integration and management of all sources of support to meet Warfighter sustainment and readiness requirements.

The Product Support Business Model (PSBM) was developed to assist the PM and PSM, who must be tightly aligned, with the numerous supportability considerations and trade-offs that take place during the development and fielding of a weapon system. The PSBM defines the hierarchical framework and methodology through which the planning, development, implementation, management, and execution of product support for a weapon system component, subsystem, or platform will be accomplished over the life cycle. The model seeks to balance weapon system availability with the most affordable and predictable total ownership cost. Performance-based product support is a mechanism for accomplishing this task in a manner that shares performance risk between the Government and commercial product support provider(s). A properly designed PBL arrangement will align the provider's and Government's goals through the proper application of incentives. In Figure 2, the PSBM shows that alignment.

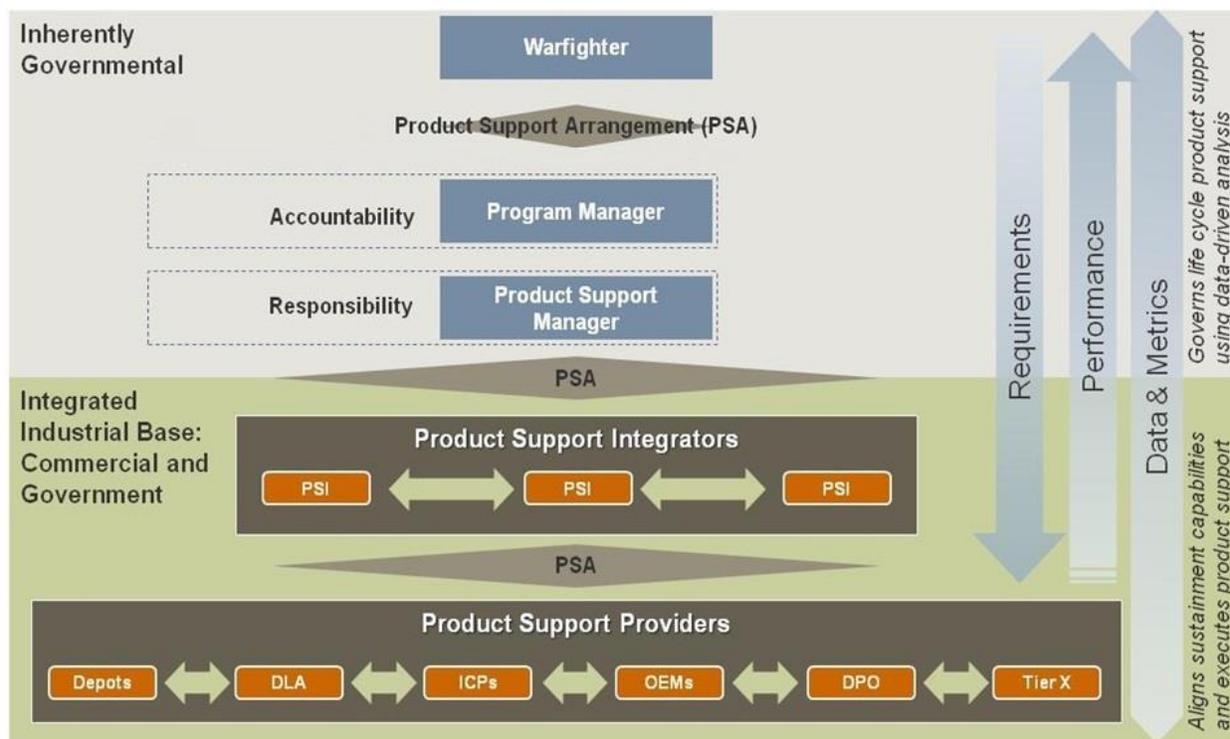


Figure 2: Product Support Business Model

Decisions made during the development phases impact the ability to execute PBL arrangements after fielding. As displayed in Figure 3, there are two main product support considerations for the PM/PSM along with the Systems Engineer during the developmental phases: 1) influence the design for supportability and 2) design and develop the support system. The optimal approach is

¹⁰ 10 U.S.C. § 2337

to include supportability and life cycle cost considerations at program inception (or before). This inclusion ensures that the attributes of the weapon system have been designed to minimize the need for logistics resources, reducing O&S costs. It also ensures that the acquisition strategy and the Life Cycle Sustainment Plan (LCSP) will address the technical and product support data needed to promote competition and other sources of supply during sustainment, keeping a downward pressure on the cost of support. For instance, sustainment managers implementing repair contracts for weapon system components should collaborate with all applicable stakeholders to incorporate the arrangement into the Weapon Systems LCSP (to include common and unique components). As the program transitions from development to fielding and sustainment, interim contractor support and performance based arrangements are constructed to mitigate uncertainty risk and collect demand data for follow-on arrangements. As the design and demand stabilizes performance and cost risk is transitioned to the PSI/PSP.

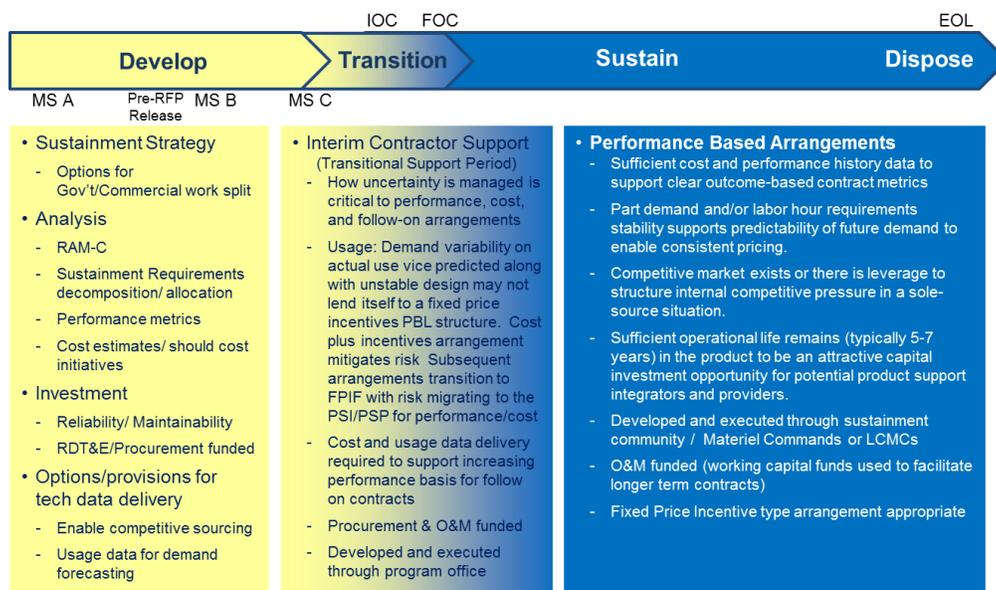


Figure 3: PBL Development and Implementation Activities across the Program Lifecycle

The risk and cost relationship is reflected in Figure 4 below. As the program or product transitions from development to sustainment, actual costs are collected and risks are mitigated with cost plus incentive type arrangements as the failure modes are determined and demand stabilizes. Once stabilized, further cost reductions are pursued by incentivizing process and product improvements. Finally, as a system, subsystem, or component approaches disposal, emphasis is placed on containing costs due associated with obsolescence, product wear out, loss of manufacturing/repair sources, etc.

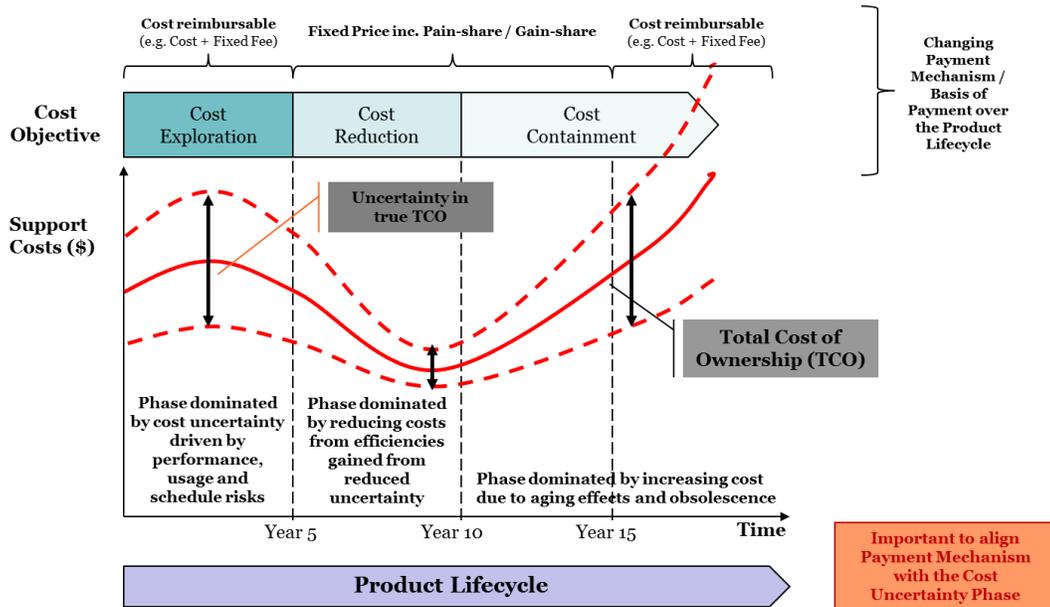


Figure 4: Generic Program/Product Lifecycle and Cost¹¹

A notional Generic Subsystem (GSS) is discussed throughout the Guidebook to allow the reader to conceptually apply the detailed steps of developing and implementing a PBL arrangement. The developmental GSS (pre-milestone C) considerations differ from those of the fielded GSS (post-milestone C); thus, considerations for both types of GSS will be discussed in Section Two. In Figure 5, the product life cycle and the developmental and fielded GSS scenarios are shown.

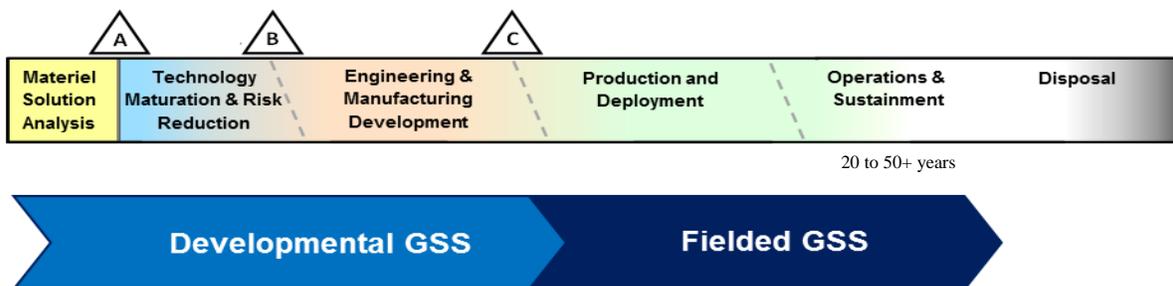


Figure 5: Program/Product Life Cycle and GSS

¹¹ Reproduced from the Australian DoD Performance Based Contracting presentation to JSF ALAC – 26th August 2015

Figure 5 depicts a hardware intensive program, as captured in Model 1 of DoDI 5000.02. This is the classic model that has existed in some form in all previous editions of instruction and is the starting point for most military weapon systems. For software-intensive or accelerated programs, Hybrid Model A or Models 2-4 may be more appropriate, and the phasing of the activities discussed below will need to be tailored appropriately.

1.6.1. Materiel Solution Analysis

The Materiel Solution Analysis phase provides the first significant opportunity to influence the supportability and affordability of weapon systems by balancing Warfighter requirements and desired operational capabilities with support and cost considerations. The Analysis of Alternatives (AoA) is completed at this time, which includes a comparison of the life cycle support approaches and costs. Suitability attributes (reflected in metrics such as Materiel Availability, Reliability, O&S cost, and other sustainment metrics) that are required to support the Warfighter should be evaluated in requirements trade-offs, along with performance characteristics (such as speed, range, and lethality for hardware and speed, agility and scalability for software). A failure to do so can result in a solution that creates unaffordable demands for resources during operations and sustainment. In Table 4, the key considerations that support performance-based solutions are highlighted.

Key Considerations That Support PBL Strategies and Arrangements

- Work with the Warfighter to establish sustainment requirements that are specific and measurable at program initiation.
- Identify and quantify O&S cost and readiness drivers early, and pursue opportunities to mitigate via system design and sustainment alternatives.
- Influence design for reliability, maintainability, prognostics and diagnostics, and special requirements for hardware (e.g., corrosion control), plus modularity, reusability, and testability for software.
- Promote standardized (common) systems, components, spare parts, and support equipment. This enables the greatest flexibility and competition for PBL arrangements in sustainment.
- Produce a product support intellectual property strategy, including ownership needs as part of the acquisition strategy being developed for a Milestone A decision. This enables multiple provider and system/subsystem options for PBL.
- Promote standard and stable manufacturing/factory floor processes that could be used in the depot, as well as production activities.
- Promote structured, consistent processes for software development and sustainment activities based on standard maturity models. This enables the greatest flexibility and competition for PBL support solutions.
- Ensure the broad product support strategy requirements are aligned with the Warfighter’s requirements.
- Search within and outside of Service for existing support solutions that will satisfy Warfighter requirements and reduce support costs.

Table 4: PBL Key Considerations¹²

1.6.2. Technology Maturation and Risk Reduction

During the Technology Maturation and Risk Reduction phase, supportability design features (e.g., reliability, maintainability) are incorporated in the overall design specifications, as reflected in the system requirements review (SRR) and preliminary design review (PDR). This phase is critical for establishing the life cycle costs of the program. Maintenance and logistics support planning are coordinated with design (levels of maintenance, repair skills, support equipment, etc.). Suitability (supportability) attributes should be incorporated and reflected in the support system designs, including Low Observable (LO) maintenance, ease of removing and replacing components, and other human/systems interface considerations. The Reliability, Availability, and Maintainability Cost (RAM-C) rationale approach is integrated within the systems engineering process. Continued analysis refines the conceptual support strategies that were previously developed into an integrated preliminary product support solution. Core and other depot requirements are determined and included in the support solution. Technical, cost, and schedule risks associated with hardware and software development must be managed throughout the program’s life cycle and will be an important topic at all decision points and milestones.

¹² Compilation from OSD Guidance, DAU learning aids and Subject Matter Experts input

The intellectual property (IP) required to implement a PBL arrangement should be identified and included in the system's IP Strategy and summarized in the Acquisition Strategy (AS). At this stage, the IP approach is part of overall program considerations such as technical data and computer software deliverables, patented technologies, and appropriate license rights. It is important to note that the IP approach will have significant influence on the flexibility of sustainment arrangements available to the program in the future, particularly the ability to compete sustainment support. In this regard, it is important to carefully consider both what types of IP (i.e., technical data and/or computer software) and what level of data rights (i.e., unlimited, government purpose, restricted or limited) may be necessary to satisfy future sustainment requirements, and then evaluate the various approaches and costs to acquire such rights. Data rights issues are complex and require careful examination of the program's requirements and overall support approach, as insufficient data rights can restrict the Government into a position whereby sole source support from the prime vendor is the only course available. Programs should include IP considerations as part of their overall business case analysis to weigh the benefits of reduced savings upfront against flexibility and potential savings in the future.

1.6.3. Engineering and Manufacturing Development

Engineering and Manufacturing Development (EMD) completes all needed hardware and software detailed design, systemically retires or mitigates any open risks, builds and tests prototypes or first articles to verify compliance with capability requirements, and prepares for production or deployment. This phase includes the establishment of the initial product baseline for all configuration items. One of the PM/PSM's objectives in the EMD phase is ensuring the program develops an integrated product support (IPS) solution that meets readiness requirements, Materiel Availability (A_M) and Materiel Reliability (R_M), while taking advantage of Should Cost¹³ opportunities to reduce projected O&S costs. Trade-offs between supportability and other design constraints (weight, size, bandwidth, etc.) should be performed that result in maturing design within the budget and schedule. The product support models used for inventory planning, manpower planning, training, planning, etc., are updated with actual versus estimated data as it becomes available during this phase of development. Reliability growth success/issues are assessed and adjustments to the product support solution are made to accommodate projected demand for logistics resources. It is critical to have robust testing to ensure reliability requirements are being met. As the design matures, the trade space for sustainment solutions narrows and the sustainment strategy becomes more refined. For this reason, it is extremely important to consider future PBLs during weapon system development. PBL considerations should be part of the Production/Quality Assurance (QA) process since repair processes (included in the PBL) are impacted by production build decisions.

1.6.4. Production and Deployment

During Operational Test and Evaluation (OT&E)/Production (Low-Rate Initial Production (LRIP) and Full-Rate Production (FRP))/Deployment phases, issues identified through various tests, demonstrations, and other evaluation techniques are addressed and remediation plans are executed. LRIP for MAIS programs and other software systems is typically limited deployment or limited fielding. As products are fielded and logistics demand can be reasonably forecasted,

¹³ Discussion of "Should Cost" can be found in Better Buying Power 2.0 at <http://bbp.dau.mil/bbp2focus.html>

performance-based arrangements can be implemented. Early in this phase, shorter-term cost-type incentive arrangements are appropriate until sufficient cost data and technical data on failure modes and rates and field reliability data are accumulated in conjunction with design stability. This approach allows cost visibility through the use of a cost-reimbursable contract. It shares cost risk via gain (or pain) share and allows for incremental transfer of risk to the PSI/PSP. Later arrangements may use a combination of fixed-price contracts with incentives and other consideration as the design stabilizes, tailoring the contract type to the appropriate level of design maturity and stability. Longer-term fixed price-type arrangements that incentivize continuous process and product improvement at a reduced cost are appropriate with a reasonable ability to forecast demand, and assess risk and cost impacts. PPPs are an excellent way to leverage the best of Government and commercial expertise. The commercial PSI or PSP provides lean repair processes, a responsive supply chain for bit/piece parts, and sustaining engineering. The public sector provides a skilled workforce at very competitive labor rates and repair and transportation assets. Once fielded, the performance-based solution and associated arrangements are measured against their ability to meet planned A_M , R_M , O&S cost, and other sustainment metrics required to support the Warfighter.

1.6.5. Operations and Support

The Operations and Support phase of a system or product life cycle is the longest phase of the life cycle and generates the largest portion of LCC—approximately 60–75 percent depending on the weapon system category—even though the ability to influence LCC is reduced at this point. The ability to implement and execute performance-based arrangements provides the greatest opportunity to positively impact LCCs while satisfying Warfighter requirements. The goal is to utilize performance-based arrangements with the appropriate contract structure and incentives to motivate the desired PSI/PSP behavior. The result is an arrangement that delivers required warfighting capability (while protecting the government if not achieved), positively impacts O&S costs, and satisfies the provider's need for profitability.

Software support considerations in Sustainment are uniquely different than those of hardware support.¹⁴ Hardware support activities are typically dominated by preventive and corrective maintenance. When software fails, the software engineer does not replace the offending code with an identical piece of code, but rather must modify the code to provide the needed functionality. Software modification is undertaken to defect corrections, address policy or doctrine, ensure safety, enable interoperability, reflect hardware changes, accommodate technology insertion, and incorporate functional changes. While hardware improvements are incorporated for these reasons as well, as stated above, they do not represent the routine reason for repair.

Software support costs include the update, maintenance and modification, integration, and configuration management of software. The respective costs of operating and maintaining the Software Support Environment (SSE) (the associated computer/peripheral equipment and associated software dedicated to performing software maintenance) and the cost to conduct all testing of the software are also included. Other costs may include licensing fees for commercial software and accreditation of processes and facilities.

¹⁴ NAVAIR Software Logistics Primer Version 1.0 DTD August 2008 (<https://acc.dau.mil/CommunityBrowser.aspx?id=203465>)

The identification and establishment of Software Support Activity (SSA) is often the first step in the preparation of post-production software support. The SSA typically assumes the role of providing post-deployment life cycle support for modifications or upgrades made to a system’s software following the system’s initial fielding. The SSA can be an organic or commercial activity or a mixture of both, and is often established via performance-based arrangements.

Table 5 displays circumstances where PBL arrangements should be considered.

PBL arrangement(s) should be considered under the following circumstances:
Issue: System availability or derivative sub requirement for subsystem or component is consistently below the required threshold
Opportunity: Part demand and/or labor hour requirements have achieved a level of predictability post-fielding that supports consistency of pricing in the market of potential product support providers
Opportunity: Number of potential product support providers is sufficiently large to serve as a competitive market, or leverage ¹⁵ exists to structure internal competitive pressure in a limited or sole-source situation

¹⁵ The government is often in a position to structure the terms of an arrangement to increase product quality and process efficiency even in the absence of a competitive marketplace

Opportunity: Sufficient operational life remains (typically five to seven years) in the product as an attractive capital investment opportunity for potential providers
Opportunity: Common subsystems or components among platforms and/or Services that, when combined, improve the Government’s negotiating leverage and offer industry the opportunity to benefit from scale economies
Opportunity: Actual sustainment costs exceed programed resources, life cycle cost estimates, or should cost management efforts indicate an opportunity to lower the cost of required performance

Table 5: When to Pursue a Change in Product Support Strategy

Product support solution performance is continuously monitored by the PSM during the Operations and Support phase, and provider performance is measured with metrics commensurate with the delegated responsibility. Technical and product data delivered as part of the product support solution facilitate this process and provide the PM/PSM the opportunity to reallocate resources and/or re-compete aspects of the support solution as appropriate.

2. 12-Step Standard and Repeatable Approach to PBL

A gap identified by the DoD through the course of the OSD-chartered PBL study (Proof Point) was the need for standardized repeatable processes to facilitate effective performance-based PSAs. The processes and procedures described herein are intended to fill that gap. Users are reminded that PBL arrangements are not “one size fits all,” and the development processes should be tailored to the specific needs of their program as appropriate. This document will assist the Program Office in the creation, management, renegotiation, and/or re-solicitation of performance-based arrangements, realizing that this process may involve more rigor than current transactional arrangements.

The 12-Step Approach to PBL follows the 12-Step Product Support Strategy Process Model found in the **PSM Guidebook**. This Guidebook provides complementary information on specific activities within each of the existing 12-Step processes and focuses on the “how” regarding PBL arrangement development and execution. The 12-Step model is a repeatable process that facilitates the successful accomplishment of these activities. The model should not be seen as rigid, but instead as flexible to support the unique needs of individual programs. The steps may be performed in a different order, or they may be repeated or deleted depending on the life cycle phase and program requirements. Figure 6 illustrates the 12-Step Product Support Strategy Process Model. This model provides the framework for a standard and repeatable process.

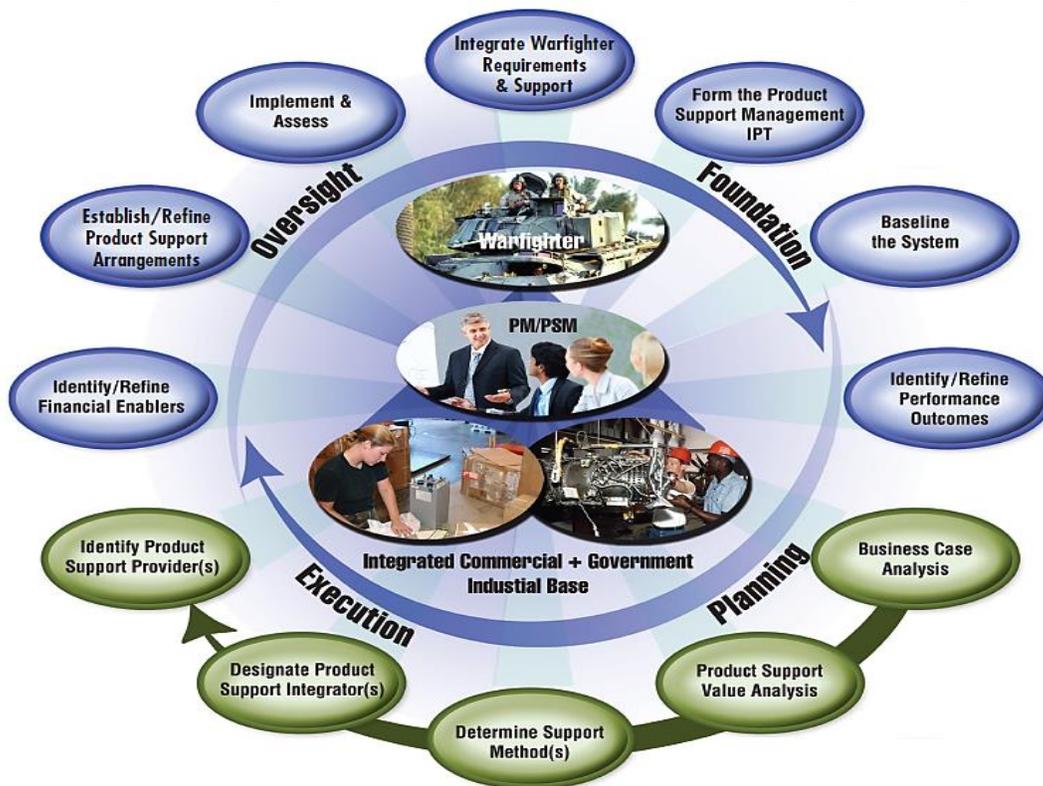


Figure 6. The DoD Product Support Strategy Process Model¹⁶

Throughout this section, a notional Generic Subsystem (GSS) is used to illustrate in practical terms the content of the preceding associated step. In the GSS use case, the PBL strategy is being considered after fielding, which is a common practice. However, guidance on developing PBL strategies during the development phase(s) of a program is also addressed throughout the document (See blue “Developmental System Consideration” boxes at the end of each step). While consideration of PBL arrangements throughout the life cycle is appropriate, consideration early in development provides the program with the greatest latitude to achieve the required performance at lower cost during sustainment.

¹⁶ PSM Guidebook (April, 2011)

2.1. Step 1. Integrate Warfighter Requirements & Support

2.1.1. Introduction

When considering a sustainment strategy, the Program Office team (for Major Defense Acquisition Programs (MDAP) and Major Automated Information Systems (MAIS) should always start in the same place: identifying Warfighter requirements. The objective of product support is to execute a sustainment strategy that delivers affordable readiness, defined as providing mission capability to the Warfighter at the lowest possible cost to the taxpayer. The first step in developing a product support strategy is to identify the operational requirements for the system being supported — even if the PSM is considering a PBL at the subsystem or component level that utilizes a decomposition of A_M or A_O as the assigned metric.

Step 1 is particularly important when structuring a performance-based logistics arrangement, as the outcome will be derived from Warfighter requirements. In order to properly align the objectives of the PMO and the PSI and PSP, it is crucial to understand the Warfighter’s requirements for system performance. In most cases, the Warfighter’s requirement will be some form of availability and reliability allocated by the program to the system, subsystem, or component level.

Insights for Success

While identifying Warfighter requirements during Step 1, it is important to have an end user involved to provide ground level insights.

The Joint Requirements Oversight Council (JROC) requires a sustainment Key Performance Parameter (KPP) for all Acquisition Category (ACAT) I and select ACAT II programs. The Sustainment KPP consists of two elements: A_M and A_O . JROC also requires two sustainment Key System Attributes: Reliability and O&S Cost. More information is available in the Joint Capabilities Integration Development System (JCIDS) Manual and the Defense Acquisition Guidebook. Table 6 lists the life cycle sustainment requirements.

Key Life Cycle Sustainment Requirements	
Sustainment Key Performance Parameter (KPP)	
Material Availability (A_M)	A_M is the measure of the percentage of the total inventory of a system operationally capable, based on materiel condition, to perform an assigned mission. This can be expressed as the number of operationally available end items/total population. This metric is not applicable to nonmateriel solutions. ¹⁷
Operational Availability (A_O)	A_O is the measure of the percentage of time that a system or group of systems within a unit are operationally capable to perform an assigned mission and can be expressed as uptime/(uptime + downtime).

¹⁷ A Nonmateriel Solution changes doctrine, organization, training, materiel, leadership and education, personnel, facilities, or policy (including all human systems integration domains) to satisfy identified functional capabilities. The materiel portion is restricted to commercial or nondevelopmental items, which may be purchased commercially, or by purchasing more systems from an existing materiel program.

Sustainment Key System Attributes (KSA)	
Reliability	R_M is a measure of the probability that the system will perform without failure over a specific interval, under specified conditions. More than one reliability metric may be specified for a system as appropriate.
Operating & Support (O&S) Cost	Total O&S costs associated with achieving A_M .

Table 6: JCIDS Sustainment Requirements

How is A_M related to A_O ? As shown in Figure 7, A_O is typically a subset of A_M . A_O is measured as a snapshot, the number of assets that are mission capable assigned to a unit at a given point in time; while A_M reflects the total inventory of a system at a given point in time from placement into operational service through the planned end-of-service life. A_M is typically the appropriate metric for expressing the Warfighter’s product support requirements.

Insights for Success

Throughout the process, the PSM or IPT lead will collect feedback from various stakeholders on what is interpreted to be the Warfighter requirement. It is necessary to vet these inputs to ensure their validity.



Figure 7: Relationship between A_O and A_M

2.1.2. Process

As stated in the interim version of DoDI 5000.02 (2013), “the Program Manager will deploy the product support package and monitor its performance according to the Life Cycle Sustainment Plan (LCSP)...a successful program meets the sustainment performance requirements, remains affordable, and continues to seek cost reductions by applying “should cost” management and other techniques...doing so requires close coordination with the war fighting sponsor (i.e., user), resource sponsors, and materiel enterprise stake holders, along with effective management of support arrangements and contracts.” The PM/PSM is responsible for communicating the

Warfighter requirements to the PSI/PSPs and determining the appropriate method for allocating the requirements in PBL arrangements.

Warfighter requirements are set by the operational commands or Service requirements offices through the JCIDS process and formalized in the JCDIS requirements documents. How the PM will address them may be further articulated in the arrangement between the PM and the Warfighter command(s). If the sustainment objective for the platform or end item has not already been explicitly documented, the platform-level PSM should work with the Warfighter to establish an arrangement that designates the top-level sustainment outcome and supporting metrics as appropriate.

The requirements and associated metrics should be defined during the Material Solution Analysis (MSA) phase and ultimately documented in the Capability Development Document (CDD). The PM, with the service requirements officer, may negotiate revisions to the requirements as the system design and sustainment strategy matures. An Integrated Data Environment (IDE) is a useful tool in tracking and managing requirements as the program design evolves. The PM and PSM should review and revalidate the requirements and threshold values with the operational commands to identify the threshold value for this metric (e.g., A_M of 85%). Revalidation is particularly important when test data and operational performance data become available.

2.1.3. Conclusion

The PM/PSM should coordinate with Warfighter representatives to ensure product support requirements are identified/documented and threshold values are established/updated.

Identifying Warfighter requirements is the first step toward establishing a PBL arrangement. Many PBL arrangements are executed at the subsystem or component level, and the system-level requirement should be decomposed to lower-level metrics appropriate for the level of responsibility and risk assigned to the PSI and PSP. These are the metrics that will be included in the PBL arrangement and the outcomes of these arrangements must be linked to the overall system-level requirements.

Insights for Success

Ensure that Warfighter requirements as well as anticipated outcomes of the PBL strategy are identified, known and agreed upon early in the 12-step process by all stakeholders.

2.1.4. Concepts in Action: Generic Subsystem Use Case

The PM for GSS has decided to investigate if a PBL arrangement may help in achieving the sustainment strategy for the subsystem. After reviewing the material in Section 1, the PM is ready to proceed with the first step: identifying Warfighter requirements.

Step 1: Developmental System Considerations

For pre-production systems, the sustainment requirements are defined during the Material Solution Analysis (MSA) phase and ultimately documented in the Capability Development Document. It is important that the sustainment strategy is carefully examined, and the design and contract needs are specified before Milestone B to preserve the greatest latitude after Milestone C. Among the areas requiring close review are the intellectual property strategy, cost/reliability trade-offs, performance, obsolescence, and logistics footprint. The Government's options for commercial competition and stand-up of organic capability is contingent upon securing the relevant technical data, license agreements, software documentation, software, and any other applicable intellectual property.

The GSS is installed on a larger platform, and the sustainment requirements for the GSS are derived from the operational requirements for this platform. The platform has an Operational Availability (A_O) target of 90%, as determined by the units for the platform. Based on the failure rates of the GSS and the size of the inventory, the PSM has calculated that the A_M requirement for the GSS is 85%. The current inventory of complete GSS assemblies exceeds the fleet size of the platform end item. As long as 85% of the inventory is operationally capable, the system-level A_O target of 90% can be met. In addition, the GSS is on average responsible for less than one percent of the Non-Mission Capable (NMC) end items. If the GSS were a significant readiness driver for the end item, the PSM may have considered a higher A_M target. It is sometimes difficult to link the availability requirements for an individual subsystem to the platform-level requirements, but with the right data (i.e., data that indicate how the subsystem is impacting system availability) and in cooperation with the platform-level PSM (if different from the subsystem PSM), these metrics can be derived.

2.2. Step 2. Form the Product Support Management IPT

2.2.1. Introduction

The second step of the 12-Step process is for the PSM to leverage the subject matter expertise within the PO, supplemented by PBL experts in the supply chain and user organizations, to form a Product Support Management IPT (PSM IPT). The PSM IPT is a collaborative working body comprising key program staff and stakeholders whose purpose is to develop a product support solution. The PSM is responsible to the PM for the management and oversight of life cycle product support for the materiel system and software, and the PSM must establish and lead the PSM IPT to ensure its collective input, expertise, and support are leveraged to address the multitude of required supportability tasks. There are various disciplines represented within the PSM IPT, including Life Cycle Logistics, Engineering, Finance, Contracting, Legal, and individuals from other functional groups specific to the program and life cycle needs. For software intensive programs, it is critical to embed software representatives early in the program to ensure software-unique management issues are addressed.

Insights for Success
By including the Finance/Comptroller early in the 12-step process, the timeline for securing funding can be minimized. This also affords the Finance/Comptroller an opportunity to gain a better understanding of the sustainment approach.

Representatives of the PSM IPT will collaborate to deliver an integrated, affordable product support package that includes appropriate arrangements, both organic and commercial. The PSM maintains the PSM IPT throughout the program life cycle, as this body will be tasked with supporting the PSM in defining, developing, and implementing the product support strategy. The PSM IPT will also support the PM and PSM in preparing for milestone reviews and Independent Logistics Assessments (ILA). PSMs should ensure that members possess appropriate PBL expertise to help maximize opportunities for performance-based arrangements in the program’s support strategy.

2.2.2. Process

The PSM IPT is led by the PSM and should include all appropriate stakeholders, including Warfighter representatives. The team may consist of both Government and commercial functional experts. It is crucial that all members are able to work collaboratively, regardless of their organizational alignment or sustainment preferences and objectives. The core PSM IPT members are responsible for assisting the PSM with planning, developing, and implementing the product support strategy, and overseeing the product support performance. Additional stakeholders and subject matter experts (SME) involved in sustainment will be consulted as their expertise is required. In Figure 8, a typical PSM IPT is shown, with the suggested core team outlined in blue.

Insights for Success
Involve stakeholders early on and frequently throughout the 12-step process. This will ensure engagement and awareness of the sustainment approach, leading to timely inputs and alignment. <i>Involvement from end to end.</i>

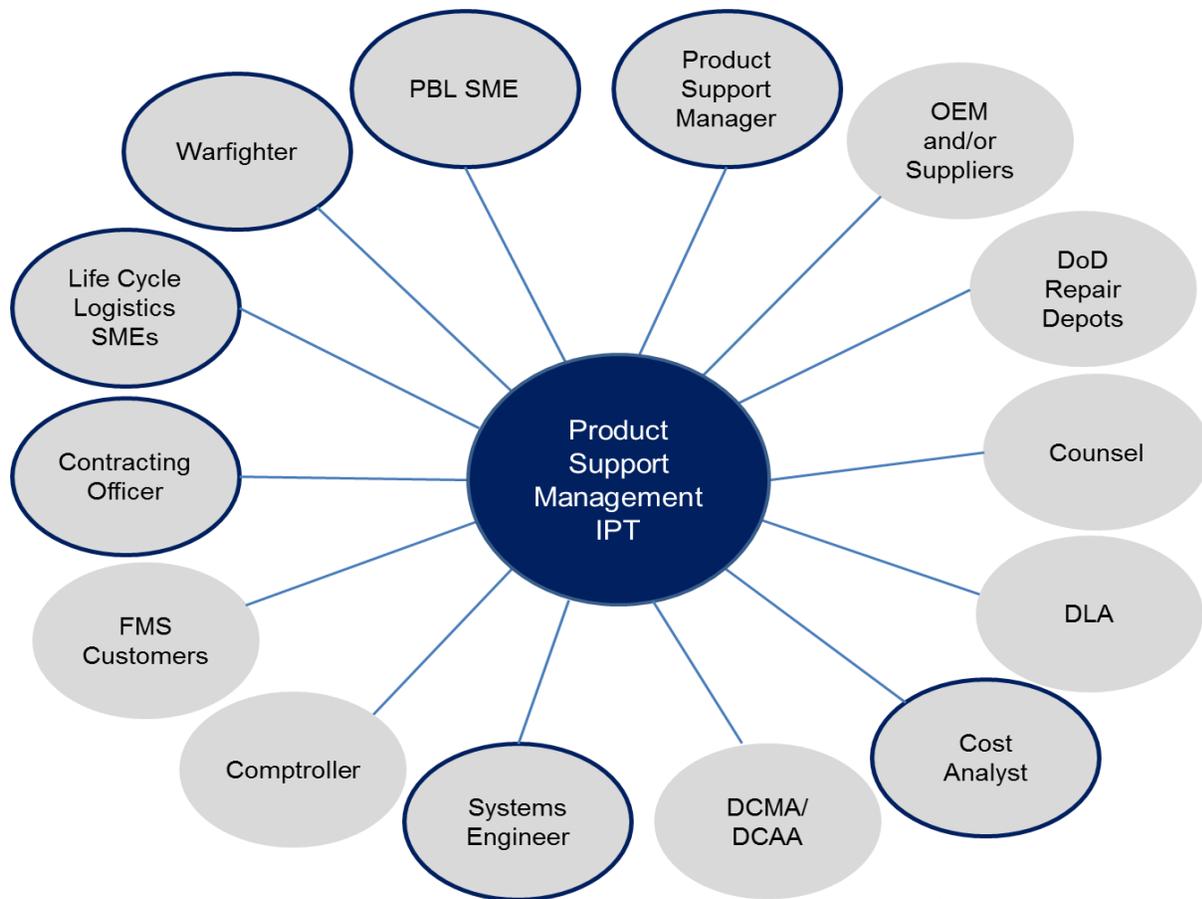


Figure 8. Product Support Management IPT¹⁸

The composition of a structured PSM IPT drives the success of pre-execution efforts such as the issuance of contracts with industry or establishment of intragovernmental Memorandums of Understanding (MOU) or MOA. The team also ensures the proper transition into ongoing performance management activities. After the PSM IPT is assembled, the members should determine their goals, develop Plans of Action and Milestones (POA&M), and obtain adequate resources.

Adequate funding can be among the most challenging issues the PSM IPT must manage when implementing a PBL arrangement. A best practice that can mitigate funding constraints to PBL implementation is for the PSM IPT to include representatives from the Service resource sponsor and the materiel command responsible for managing Operations and Maintenance (O&M) funding for the fielded system. These representatives can inform the team on planning factors driving the choice of funding mechanism (e.g., direct appropriation, working capital fund) and appropriation type (e.g., Procurement, O&M).

PBL Leading Practice(s)
Leverage PBL expertise and lessons learned from other Program Offices with similar systems, PBL Award Winners, and PBL SMEs within DoD.

¹⁸ PSM Guidebook (April, 2011) section 4

The PSM should develop a PSM IPT charter, which outlines the activities, roles, responsibilities, key deliverables, initial implementation project plan, and an executive summary review schedule. The charter should also include the names, contact information, alternates, and expected time commitments from the participants. See Appendix B for a sample PSM IPT charter. The PSM IPT should be included among the management groups listed in the LCSP. Table 7 lists the principles for establishing the PSM IPT.

Insights for Success
In order to drive tasks to closure, the PSM must outline and emphasize IPT member roles and responsibilities and assign sub-IPT leads. Doing so will help execute the 12-step process throughout each phase. <i>If everybody's responsible – nobody's responsible.</i>

PSM IPT Principles
<ul style="list-style-type: none"> • When establishing the PSM IPT, the PSM should: <ul style="list-style-type: none"> ○ Streamline the membership to include only relevant stakeholders and SMEs. Add or remove members as necessary to ensure the right mix of expertise is available and utilized when needed. ○ Ensure the team members have a life-cycle perspective of cost, risk, and benefits. ○ Facilitate buy-in from all team members by soliciting open and honest communication and developing trust and mutual respect among members. ○ Ensure that Non-Disclosure Agreements (NDA) are in place for any contracted advisory assistance that will be part of the IPT. NDAs are particularly important when the program expects the OEM or other vendors to provide proprietary data. • The team should focus on life-cycle management, involving sustainment in all aspects of the product life cycle. This includes recommending potential design changes that facilitate application of PBL strategies to meet requirements and reduce costs.

Table 7: PSM IPT Principles

Throughout each of the 12 steps, the PSM IPT should periodically review the status and risks in developing the LCSP and associated arrangement. Summaries of these reviews should be used to inform the PSM and brief the PM on the IPT's progress. Detailed discussion on required expertise and training for the team is provided in Appendix C.

2.2.3. Conclusion

The result of Step 2 should be a cohesive product support team that is fully trained on PBL fundamentals and has a thorough understanding of the benefits associated with an outcome-based product support strategy.

Step 2: Developmental System Considerations
The PM/PSM should engage engineering and sustainment SMEs who can estimate the impact of sustainment cost and performance. The team might use system modeling/simulation or an evaluation of similar deployed systems to estimate the performance and cost of the system when it reaches sustainment. A thorough evaluation of the impact of engineering design trade-offs on the sustainment strategy will inform the PSM IPT regarding the magnitude of constraints it will face in developing PBL arrangements.

2.2.4. Concepts in Action: Generic Subsystem Use Case

The PSM for the GSS assembled the PSM IPT with the representatives listed in Figure 6, including a representative from a program who successfully implemented a PBL arrangement on a similar subsystem arrangement. The PSM conducted a baseline survey (see example in Appendix C) to determine the experience level of each team member. Only one team member had previously implemented a PBL arrangement. Some members had taken DAU's course on performance-based logistics (LOG 235). The PSM encouraged the team members to read OSD guidance and the DoD Business Case Analysis (BCA) Guidebook in preparation for the knowledge transfer workshop. The PSM hosted a kickoff session for all of the PSM IPT members where the objectives, timeline, roles, and responsibilities for the PBL implementation were outlined.

2.3. Step 3. Baseline the System

2.3.1. Introduction

This step assesses the “As-Is” product support strategy, plan, and arrangements and determines if further analysis is warranted to change the plan from its current baseline. The “As-Is” analysis identifies possible impediments and improvement opportunities. This step is conducted in three phases:

- Data Collection
- Data Analysis
- Insight/Recommendation Generation

Baselining the System is a quick assessment to give the program insight into whether a performance-based strategy is feasible. Additionally, this assessment provides sufficient decision-making information to determine the extent to which a more detailed analysis and review is required.

For a new system, establishing an initial baseline requires engineering and supportability data. The initial baseline should be established at Milestone A; however, this may only be possible at a higher level of the hardware or software description. The program’s confidence in the assessment is limited by its ability to allocate performance measures lower than major subsystems (e.g., structure, propulsion, and mission equipment). During the earlier life cycle phases, analogous data from similar systems are required to project the system’s baseline. As the program advances to later milestones, additional data will be available from systems engineering and product support analyses to include but not limited to: Reliability, Maintainability, and Diagnostics predictions, Failure Mode, Effects & Criticality Analysis (FMECA), Failure Reporting and Corrective Action System (FRACAS), Level of Repair Analysis (LORA), Maintenance Task Analysis (MTA), Reliability-Centered Maintenance (RCM) analysis, and Reliability, Availability, and Maintainability (RAM) and LCC analyses.

For fielded systems, this step begins with the inventory of assets and services that will be considered in scope for the analysis of alternatives. For instance, the PSM IPT should scope the assessment to an appropriate level (system, subsystem, components, or potentially spanning multiple programs or Services). The PSM IPT should also consider the product support elements that should be included in the alternatives.

PBL Leading Practice

If a program is in development, data availability will evolve as the platform progresses through its life cycle and should be given appropriate attention when available. This process includes replacing estimates with actual data or refining estimates that resulted from test and operational experiences.

PBL Leading Practice(s)

Potential PBL arrangement candidates for fielded programs may have the following characteristics: legacy systems with poor reliability, system availability, obsolescence issues, and increasing repair costs.

The PSMIPT, along with the representatives of the materiel command as appropriate, should consider the questions in Table 8. The answers to these questions will provide the team with an initial understanding of the opportunities for improvement to the baseline.

Initial questions that inform potential benefit	
Cost	<ul style="list-style-type: none"> • How many systems, subsystems, or components under consideration are in the system (e.g., 256 F117 engines inducted per year)? • What will it cost to field new infrastructure (organic or commercial) or to modify the current infrastructure? • How much does the system cost (specifically the replacement cost of the system or subsystem)? • What is the projected annual spending to support the system (i.e., does the annual spend support time required to analyze alternatives)? • Is the number of potential product support providers sufficient to serve as a competitive market, or does leverage exist to structure internal competitive pressure in a limited or sole-source situation? • Have part demand and/or labor hour requirements achieved a level of predictability post-fielding that support consistency of pricing in the market of potential product support providers? • Are there common subsystems or components among platforms and/or Services that, when combined, improve the Government’s negotiating leverage and offer industry the opportunity to benefit from scale economies? • Is there an opportunity to lower the sustainment cost to achieve the required operational performance?
Readiness	<ul style="list-style-type: none"> • Is the system availability or the derivative requirement for subsystem or component consistently below or projected to be below the required threshold? • How are the systems, subsystems, or components in question being supported today?
Other factors	<ul style="list-style-type: none"> • Is there sufficient operational life remaining (typically five to seven years) in the product to warrant a change to the support solution and be an attractive investment opportunity for potential providers? • Are there any planned upgrades, service life extension programs, or overhauls? • How is the PO organized? Where do logistics, maintenance, finance, and contracting competencies fit within the PO?

Table 8: Initial Questions for Cost, Readiness, and Other Factors

This step will provide insights about the program’s operational and cost data to determine if continued analysis for a change in sustainment strategy is needed. If the result of the assessment indicates that an alternative strategy with performance-based arrangement(s) can maintain/improve performance and/or reduce costs for the program, the PM will make the decision to proceed to the BCA (or appropriate type of economic analysis).

2.3.2. Process – A Three Phase Approach

The PSM IPT should follow the three-phase approach for assessing the current product support strategy:

- Data Collection
- Data Analysis
- Insight/Recommendation Generation

These phases will guide the IPT as they analyze if the program is a potential candidate for an alternative sustainment strategy, specifically a performance-based strategy that may improve performance and/or reduce costs. Each phase is detailed below.

Insights for Success
Designate a point of contact to be responsible for gathering all data and collecting it into one format where all information is available.

2.3.2.1. Phase 1: Data Collection

Data collection begins with the development of a data collection plan. The data collection plan will list the data needed to conduct the product support assessment. Part of this initial phase is understanding what “good” data looks like. Whenever possible, the data collected should be linked to an event (e.g. it took 49 days to fill the requisition for part ABC). Additionally, data should be collected in its rawest form possible; avoid grand totals or pre-calculated metrics that make it difficult to conduct novel analysis and/or use different assumptions or calculations.

Insights for Success
During the data collection phase, data should be submitted in its rawest form. This allows data analysts to draw their own conclusions from the data and site original data if there are questions about the assessment/findings.

The data collection plan does not necessarily have to be elaborate or complex, however it should be comprehensive. The complexity will be dependent on the program’s characteristics as well as its life cycle stage. It can be as simple as a table or a two-page outline. The data collection plan should include the data source to establish accountability and improve the accuracy and the traceability of the data collected for any necessary follow ups. Table 9 below, based on the F to A condition repair process, is an example of a sample data collection chart. The data highlighted in the bottom row will aid the PSM IPT as they analyze the current product support strategy.

	Inputs	Activities	Outputs	Outcomes
Elements	<ul style="list-style-type: none"> F-Condition Assets Backorders/MICAPs Demand Budget A-Condition Assets 	<ul style="list-style-type: none"> Warfighter pulls out part Turns into supply Part either sits in Storage ICP or is sent to Source of Repair Repair 	<ul style="list-style-type: none"> Delivered A-Condition Asset to Warfighter Repaired F-Condition Asset 	<ul style="list-style-type: none"> Asset is available to Warfighter when/where it is required Best value to DoD
Metrics	<ul style="list-style-type: none"> # of MICAPs/MICAP hours Back Order Quantity and Age Inventory Levels # of A-Condition Assets 	<ul style="list-style-type: none"> Repair Turn Around Time # of Failures in a period of time Customer Wait Time 	<ul style="list-style-type: none"> Number of repairs completed in a period of time Number of A-Assets Delivered versus Demanded Repair Price Annually by item Fill Rate 	<ul style="list-style-type: none"> Material Availability Stock Effectiveness Requisition Order Fill Rate Annual Spend
Data	<ul style="list-style-type: none"> A-Condition Assets Individual F-Condition Assets/Failure Incidents Data on MICAP Instances 	<ul style="list-style-type: none"> Requisition Order Dates Requisition Fill Dates Back Order Data Individual failure instances 	<ul style="list-style-type: none"> Number of Repairs Repair Price Demand Rates Supply Rates Number of Requisitions Ordered Number of Requisitions Filled 	<ul style="list-style-type: none"> CLINS Number of End Items Operational Number of End Items in Population Orders made versus Due out/Back Order Base Levels vs. Demand

Table 9: Sample Data Collection Model

Data collection also includes interviews with appropriate stakeholders and an analysis of the product support policy and other supporting documentation. The PSM IPT should ensure that all data is accurate, timely, and relevant to the Alternatives being assessed.

The team should document each meeting, interview, and received data, so individuals not present can easily access and understand the findings. Some of the data generated and analyzed will be done by a contractor, while other data may be generated/analyzed by the Government. Data delivered under contract should contain markings to indicate if there are any restrictions to the Government’s ability to use, modify, reproduce, release, perform, display, or disclose that data. These markings must be reviewed, challenged, and/or corrected when appropriate. A data dashboard in Microsoft Excel or another modeling platform can be a helpful tool for consolidating data and later manipulating and analyzing that data. Regardless of the source, the data should be placed in a central location for all members to access.

Insights for Success
When collecting and analyzing data, it is important to simplify and focus the data gathering process around Cost, Reliability, and Availability.

Not all of the data needs to be obtained prior to commencing the next phase, and in some cases certain data may not yet be available. The team should continue to monitor the data received throughout phases 1 and 2, and follow up to access remaining data before the completion of phase 2, if possible.

Table 10 details the work required to complete the Data Collection phase.

Activity	Description
Identify the Required Data and Documentation	<p>Identify required current and historical data to develop a full understanding of the program or, if in the design phase, any analogous program’s current state. Examples of pertinent data include:</p> <ul style="list-style-type: none"> • Remaining useful life • Number of assets in inventory • Historic/projected sustainment spend • Current/historic projected readiness levels <p>For new systems data sources include:</p> <ul style="list-style-type: none"> • Reliability, Maintainability, and Diagnostics predictions • Failure Mode, Effects, and Criticality Analysis (FMECA) • Failure Reporting and Corrective Action System (FRACAS) • Level of Repair Analysis (LORA) • Maintenance Task Analysis (MTA) • Reliability-Centered Maintenance (RCM) analysis • Reliability, Availability, and Maintainability (RAM) and Life Cycle Cost (LCC) analyses
Develop and Execute Data Collection Plan ¹⁹	<ul style="list-style-type: none"> • Organize data collection efforts by inspecting the data needed to analyze the inputs, activities, outputs and anticipated outcomes for the program • Request, collect, organize, and review the data • Prepare for, schedule and execute interview(s) • Meet with stakeholders to document the existing processes for procurement, maintenance/repair, and overhaul (to include a process mapping exercise with the PSM IPT, if needed) • Store all data collected in centralized locations, preferably in an electronic medium
Verify Required Information has Been Gathered	<p>Perform a reconciliation of obtained documents, prioritize/remove documents accordingly, and make additional requests for data as necessary</p>
Extract/Summarize Key Details	<p>Summarize the key information for each document and interview to facilitate analysis</p>

Table 10: Data Collection Activities

2.3.2.2. Phase 2. Data Analysis

¹⁹ The data collection plan is a working document for use by the PSM IPT and is not intended to be a formal program plan.

This phase consists of a top-level assessment to determine the extent to which further analysis and review is required. The PMO should work with stakeholders to determine material flow relationships, cycle times, labor requirements, and other process elements using process maps. The process map will help the team visualize the entire supply chain and will enable the PSM IPT to find high-level opportunities to improve the product support strategy. The process map should include the specific activities and activity owners involved in the supply chain, including supply support, maintenance, repair, and overhaul or other IPS elements as appropriate. If an existing process map does not exist, execute one with key stakeholders. Even if a detailed process map has already been documented, it is beneficial for the stakeholders to meet in order to review and validate it.

A process map – following an “F condition asset” to an “A condition asset” – is a useful tool for qualitatively baselining the current status. Stakeholders from diverse organizations should be present during the process mapping exercise.

Table 11 details the work required to complete the Data Analysis phase.

Activity	Description
Evaluate Data Collected Relative to Other Factors	Assess the data collected to determine if a reduction in cost or increase in readiness may be possible through the introduction of a performance-based arrangement. Ensure access to technical data is included in the top-level assessment, as a change in sustainment strategy will be impacted by restrictions (or a lack thereof).
Analyze Feasibility	Perform a feasibility check for the likelihood of PBL implementation.
Analyze Timing	From the data collected and interviews performed, decide if the program is ready to transition to a new strategy at this time or in the future.
Estimate Cost Savings and Performance Improvements	Determine if significant costs savings and/or readiness improvements can be achieved through a change in the PSA.

Table 11: Data Analysis Activities

Utilizing the data collected in Phase 1, the PSM IPT should seek to answer the below questions with data-driven and evidence-based responses. These key considerations for impacting readiness and cost are included in Table 12.

Factors	Key Considerations
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<p>Maintenance Planning and Management</p>	<ul style="list-style-type: none"> • Is the current maintenance planning and management strategy satisfying Warfighter requirements? • Can the maintenance process (fault reporting, transportation, workload management, etc.) be made more efficient? • Are there any substantial delays in the repair process? • Can sustainment planning and demand forecasting be more accurate and efficient through the introduction of performance incentives?
<p>Supply Support</p>	<ul style="list-style-type: none"> • Is the supply support strategy satisfying Warfighter requirements? • Can the supporting supply chains be made more efficient through the introduction of performance incentives? • Are there any substantial delays in the procurement process for spare parts or new units? • Are there significant inventory build-ups at any stage in the supply chain due to overproduction or quality issues? • Are there any Diminished Manufacturing Sources and Material Shortage (DMSMS) concerns?
<p>Market Space for Sustainment Providers</p>	<ul style="list-style-type: none"> • What is the current competitive landscape for product support providers? For suppliers of new and repair parts? Are there alternate organic sources (i.e., from another location or another Service)? • Does the organic workforce have access to applicable technical data for repair? • What is the scope of the opportunity?
<p>Funding Mechanism</p>	<ul style="list-style-type: none"> • Does the available funding mechanism (e.g., Working Capital Fund (WCF), Operations and Maintenance (O&M) funding) allow for a long-term performance-based arrangement? • If not, what other funding mechanisms may be available?
<p>Stakeholder Alignment and PBL Capabilities</p>	<ul style="list-style-type: none"> • Organic PBL Commitment: Is there support from leadership and/or from the PO? • Organic PBL Capability: Are the requisite knowledge and skills present? Are there sufficient resources available for implementation? • Commercial PBL Commitment: Is there interest from the current/potential PSP/PSI, OEM, or other commercial firms? • Commercial PBL Capability: Are the requisite knowledge and skills present? Are there sufficient resources available for implementation? • Trust and Transparency: Is there significant trust and transparency among key stakeholders? • Are there PPP opportunities available between potential organic and commercial support providers?
<p>Timing</p>	<ul style="list-style-type: none"> • Stage in life cycle: Is it the right time for a change in sustainment strategy? Is there sufficient remaining service life for a transition

	to be worthwhile? <ul style="list-style-type: none"> • What is the state of emerging technology? • Existing contracts: Are there any conflicting contractual arrangements? • Operating environment: Is change feasible under projected Operational Tempo (OPTEMPO)?
Program-Specific Considerations	<ul style="list-style-type: none"> • Are there any program-specific barriers or major opportunities?

Table 12: Factors to Consider when Assessing Readiness and Cost

An expansion of the key considerations can be found in Appendix E.

2.3.2.3. Phase 3: Insight and Recommendation Generation

The Insight and Recommendation Generation phase synthesizes the data collected and analyzed to produce insights regarding the feasibility and potential improvement opportunities from an alternate sustainment strategy. In other words, the insights gathered during this phase will be based on the following question: can an alternate sustainment strategy improve readiness and/or cost outcomes? The analysis should look to draw insight from the data, rather than regurgitate the collected information to determine a way forward. For example, rather than simply noting

Insights for Success
Consider fielded asset turnover rate in the PSA (baselining analysis). This information can be utilized in the BCA for potential reliability improvements. (Step 4 or 5).

the back order hours associated with a part in a given year, look at the trends over time or what percentage of the total back order hours that part is responsible for. These insights will provide context and reveal information framed in a new way that can help PSM IPT determine if a change in sustainment strategy is beneficial and feasible.

This process will generate two possible recommendations: a PBL arrangement is feasible for providing improved cost/readiness outcomes or not. In those cases where a performance-based logistics arrangement(s) is found to be a viable strategy, a more detailed analysis will be required. If pursuing a performance-based arrangement is deemed the inappropriate course of action (CoA), the PM/PSM should still ensure their current sustainment strategy is designed to support the Warfighter requirements at the lowest possible costs and document their decisions in the LCSP and other documentation as appropriate.

Table 13 provides a high-level view of activities for Phase 3.

Process Step	Description
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<p>Review Performance Requirements for Current State</p>	<ul style="list-style-type: none"> • If performance requirements exist, review the requirements and the current state of the program (e.g., metrics, sustainment costs) relative to the requirements. • If performance requirements are absent, provide initial performance requirements as part of the recommendation.
<p>Review Phase 2 Analysis</p>	<ul style="list-style-type: none"> • Review the analysis from Phase 2 and insights generated in Phase 3 regarding the state of the current product support strategy. • Demonstrate the benefits and disadvantages based on the findings.
<p>Create a Recommendation</p>	<ul style="list-style-type: none"> • Generate a product support assessment recommendation(s) and present those to the Decision Authority (PM, PSM, etc.). • Obtain a decision from the Decision Authority on the development and evaluation of product support alternatives (Step 5).

Table 13: Insight and Recommendation Generation Activities

2.3.3. Conclusion

The end of this step will conclude with a “Go/No-Go” recommendation for continued analysis based upon the potential benefit from a change in sustainment strategy, coupled with the feasibility of a PBL arrangement. The PMO should review the opportunities in cost savings and readiness improvements that a PBL strategy would provide and should explore potential alternatives in Steps 5 and 6.

2.3.4. Concepts in Action: Generic Subsystem Use Case

The PSM identified the necessary information using a data collection plan and conducted interviews with key stakeholders. The PSM interviewed representatives from the PO, maintenance organization, supply support division, field-level support units, and the requirements community. Using the data collected, an analysis was conducted producing key insights to share with the IPT. Based on the analysis and insights, the PSM was able to develop an understanding of the performance of the current product support strategy.

Overall, the PSM determined that the current product support strategy is meeting Warfighter requirements, but there is potential for readiness and cost improvements. As discussed previously, the GSS is responsible for less than one percent of system-level failures, which is comparable with the other subsystems on this platform. However, the PSM identified six components that are causing delay

Step 3: Developmental System Considerations

For new programs, the baseline step should include an examination of the cost to support the replaced systems. If there is no antecedent system, LCC estimates should be used. The following data may be considered:

- Reliability, maintainability, and diagnostics predictions
- Failure Modes Effects and Criticality Analysis (FMECA)
- Failure Reporting and Corrective Action System (FRACAS)
- Level of Repair Analysis (LORA)
- Maintenance Task Analysis (MTA)
- Reliability-Centered Maintenance (RCM) analysis
- Reliability, Availability, and Maintainability (RAM) and Life Cycle Cost (LCC) analyses

to the maintenance and supply support response times and whose support is costing more than planned. The GSS PSM analyzed the factors in Phase 2 above and generated the results shown in Table 14 below.

Factors	Key Considerations
<p>Maintenance Planning and Management</p>	<p>Maintenance for the subsystem is conducted organically and is considered core maintenance work. The PMO is not interested in pursuing alternative maintenance providers. The PSM IPT determined that the maintenance process could be made more efficient. In particular, the fault identification process in the field could be made more accurate to reduce the number of No Evidence of Failure (NEOF) occurrences processed by the maintenance organization.</p> <p>In interviews, the maintenance personnel identified shortages of a few components (Line Replaceable Units (LRUs)) as the source of most of the delays in the maintenance process (though the average delay could not be calculated). The reliability of the system has remained consistent since fielding, which suggests that the maintenance process has been successful at identifying and correcting failures.</p>
<p>Supply Support</p>	<p>The GSS supply chain is currently managed by the PMO in concert with the Defense Logistics Agency (DLA). The GSS is composed of 10 repairable components (LRAs/LRUs), all of which are procured by the sustainment command. The subsystem also uses consumable parts (e.g., hoses and tubes) that are supplied by the DLA. The sustainment command has wholesale stock and field stock, both of which are replenished using the DoD distribution system.</p> <p>The supply support team in the sustainment command confirmed that shortages of six components have generated delays in the maintenance process that have subsequently caused delays in the field. Although the PMO has been able to maintain the required level of availability to meet user requirements, this has required a series of unusual measures such as rush-shipping orders and refurbishing previously condemned parts. The six problem components are all long lead-time items that are ordered every two to three years. The PSM is concerned about DMSMS issues for these components, given how infrequently they are procured. The desired outcome is to have a supply chain that is responsive and reliable with acceptable planning precision while operating within cost constraints.</p>
<p>Market Space for Sustainment Providers</p>	<p>Six of the repairable components are manufactured by the OEM. The six components that are causing delays in the supply system are manufactured by the OEM. The OEM owns the technical data for these components, so other manufacturers are not available. Several independent contractors are available to provide product support</p>

	integration services, including supply integration.
Funding Mechanism	Supply support for the GSS is funded through a WCF.
Stakeholder Alignment and PBL Capabilities	<p>Organic PBL Commitment: The PM is committed to pursuing a PBL arrangement if it proves to be the lowest cost alternative that meets Warfighter requirements. The PM has support from sustainment command leadership after holding a briefing that outlined the potential benefits of PBL for GSS.</p> <p>Organic PBL Capability: Only a few PSM IPT members had prior knowledge or experience, but the PSM has requested assistance from another PMO and will be holding a knowledge transfer workshop.</p> <p>Commercial PBL Commitment: The OEM has previously expressed interest in exploring a PBL arrangement. PBL arrangements with an OEM are often pursued as part of a sole source contract, which requires a Justification and Approval (J&A) for other than full and open competition. More information on the J&A process can be found in Section 2.9.</p> <p>Commercial PBL Capability: Though the division that produces these components has not executed a performance-based arrangement, the company has experience with other systems that can be applied to the GSS.</p> <p>Trust and Transparency: Some PMO personnel are frustrated with the OEM over the supply support issues with the six components, but the PMO has a good working relationship with the OEM. The PM feels that the relationship could be improved through more frequent communication.</p>
Timing	The GSS was fielded five years prior and has 20 years of service life remaining. This is sufficient time to implement a long-term PBL arrangement, providing the OEM with the opportunity to recover needed investment for product and process improvements. The Government can realize additional savings through subsequent contract negotiations. The current sustainment contract is period of performance is expiring, which is why the PSM is considering a change in sustainment strategy.
Program-Specific Considerations	The PM and PSM are under pressure from their leadership to reduce the cost of supporting the GSS.

Table 14: Key Considerations Addressed for Generic Subsystem

Based on these findings, the GSS PSM concluded that the PMO should perform more detailed analysis to determine the potential cost savings from a PBL arrangement. There are no major barriers to a PBL arrangement: the timing is appropriate, the stakeholders are aligned, and the PMO is seeking to reduce sustainment costs. In addition, the PMO may be able to improve supply performance.

2.4. Step 4. Identify/Refine Performance Outcomes

2.4.1. Introduction

A critical component of any performance-based arrangement is the establishment of a few top level metrics which quantitatively measure how well the sustainment provider is delivering the warfighter relevant outcomes the Service is buying. These top level metrics will have specific targets established and sustainment providers will be rewarded or penalized based on their meeting or falling short of the targets. We refer to these metrics as the Key Performance Indicator metrics or KPIs. Metrics other than KPIs will almost certainly be gathered and used to assist in management activities such as causative research. However, these lower level metrics will not have targets, incentives or disincentives tied to them.

2.4.2. Process

2.4.2.1. Identify Metrics Based on the Scope of the Arrangement: Level, Delegation of Control, Product Support Elements

Metrics for support should be identified early in strategy development, documented in the LCSP, and refined as the program progresses into implementation of the PBL arrangement. Once the PM/PSMs determine the appropriate support level (system, subsystem, or component), and combination of IPS elements, the selection of metrics can begin.

For arrangements at the system level, the PSM may decide to delegate responsibility to a PSI for all aspects of product support with corresponding metrics of Materiel Availability (A_M), Operational Availability (A_O) and Material Reliability (R_M). Another system-level metric could be ‘ready for tasking’ or ‘network connectivity.’ These metrics are only appropriate as part of the PBL arrangement if the PSI has control over all applicable aspects of product support that affect system availability and/or reliability.

Likewise, the PSM may decide to delegate responsibly for one or more (but not all) of the IPS elements for the system to a PSI or directly to a PSP. The appropriate metric(s) would be those that measure performance against the specific IPS element(s) over which the PSI/PSP has control. For example, if the PSP is responsible for performing training for an aircraft system, measuring the number or pilots qualified or maintainers certified per month would be an

Insights for Success

A core source of value in the PBL Business Model is the Private Sector Provider’s ability to innovate. Metric structuring should not hinder that capability, but should shape performance without obstructing it. Metrics ought to demand outcomes, but not dictate process. *Ensure that the levers available for the contractor to adjust can affect the performance outcomes.*

appropriate metric. If the PSM decides to delegate responsibility at the subsystem or component level, then holding the PSI or PSP accountable for A_M or A_O of the entire system would be inappropriate. The provider cannot be held accountable for aspects of performance that are outside of its control. No matter how the support responsibilities are delegated, the PM/PSM *always* retains ultimate responsibility for the performance of the overall product support strategy. Figure 9 displays possible metrics as they correspond to various levels of PBL arrangements.

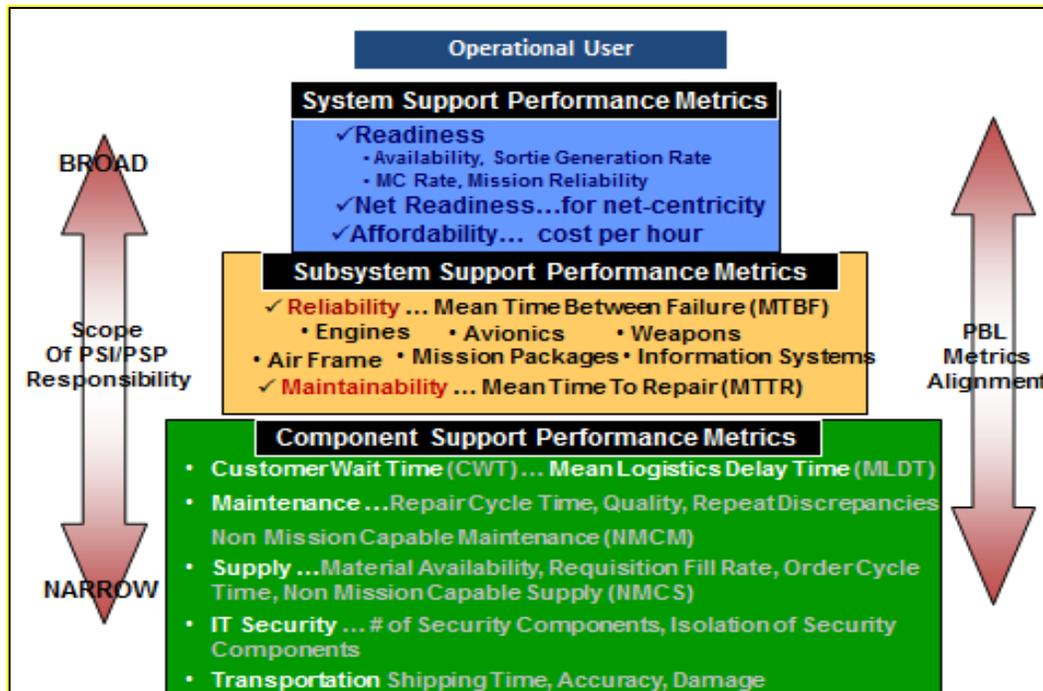


Figure 9: Metrics Alignment²⁰

As mentioned above, the IPS element(s) will also impact the metrics selected. Table 15 displays levels and IPS elements with the corresponding metric(s). See Appendix F for a more comprehensive listing of potential PBL metrics.

IPS Elements/Level	Supply Support	Maintenance, Planning, and Management	Sustaining Engineering
System	Non-Mission Capable Supply (NMCS)	Non-Mission Capable Maintenance (NMCM)	Reliability (R)
Subsystem	Supply Material Availability (SMA)	Mean Maintenance Time (MMT)	Mean Time Between Failure (MTBF)
Component	Perfect Order Fulfillment, On-Time Delivery (OTD), Back Order Rate	Repair Turn Around Time (RTAT)	Engineering Response Time

Table 15: Metrics Selection by Level and Product Support Element

²⁰ Figure 7 is only an example and is not intended to be all-inclusive.

2.4.2.2. Decomposing Metrics by Level

One of the most important considerations for selecting metrics is understanding how they link and contribute to top-level performance outcomes and each other. Therefore, in addition to understanding the relationship of metrics to the span of PSI/PSP control, it is also useful to decompose metrics to understand how they can be used to reinforce and complement each other. A breakdown of a PBL metrics hierarchy is as follows:

- **Level 1 metrics** are the performance goal or attribute for the PBL arrangement. For instance, Level 1 metrics can be A_O and A_M at the system level or supply chain delivery reliability at the subsystem or component level. Level 1 metrics will vary according to the focus of the PBL arrangement.
- **Level 2 metrics** support Level 1 metrics. The relationship helps to identify the root cause(s) of the performance gap for a Level 1 metric. If the Level 1 metrics are A_O and A_M , Reliability and Mean Down Time (MDT) would be considered realistic Level 2 metrics.
- **Level 3 metrics** support Level 2 metrics. For a Level 2 metric, such as MDT, Logistics Response Time (LRT), and Mean Time to Repair (MTTR) are examples of Level 3 metrics.

Figure 10 is an example of PBL metrics hierarchy, based on the above-described system-level arrangement.

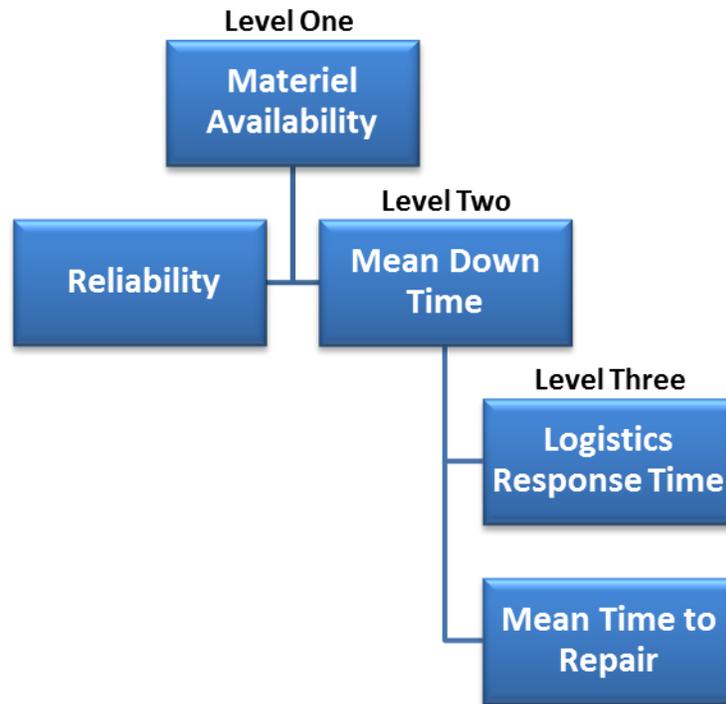


Figure 10: Metrics Decomposition

For a subsystem performance-based arrangement, a reasonable Level 1 metric or attribute may be Supply Chain Delivery Reliability. A Level 2 metric would be Perfect Order Fulfillment, followed by Level 3 metrics of Percent of Orders Placed without Error and Percent of Orders Scheduled to Customer Request Date. In this case, Level 4 metrics may be appropriate such as Percent of Orders Received Damage-free and Percent of Orders with Correct Shipping Documents. This PBL metrics hierarchy is similar to the process metrics associated with the Supply Chain Operations Reference (SCOR) model, which is applied and tailored to applicable IPS element(s) addressed in performance-based arrangements. The goal of the hierarchy and decomposition is to demonstrate how metrics “roll up” in to one another and contribute to overall Warfighter readiness and performance.

2.4.2.3. Metrics Selection for Performance and Reporting

When choosing Key Performance Indicator (KPI) metrics, it is helpful to remember, “What gets measured and rewarded, gets done” and “less is more.” An effective PBL arrangement includes a manageable number of KPIs -- two to five (maximum) – that reflect desired Warfighter outcomes and cost reduction goals. These top level KPI metrics have specific targets established and sustainment providers will be rewarded or penalized based on their meeting or falling short of the targets. The rationale for limiting the number of KPIs: as the number of KPIs grows, the smaller the incentive or disincentive associated with each KPI which results with diluting their individual and collective effectiveness in influencing sustainment provider behavior. Again, metrics other than KPIs will almost certainly be gathered and used to assist in management activities such as causative research, however, these lower level metrics will not have targets, incentives or disincentives tied to them.

Insights for Success
Ensure that throughout the 12-step process all stakeholders are interpreting, measuring and calculating the chosen metrics consistently (e.g. point of measurement at wholesale vs. retail level).

KPI selection may be an iterative process, where they are reassessed based upon the Contractor’s performance. In addition to the KPIs chosen to measure and reward PSI or PSP performance, the PSM must establish a management framework in which KPIs and lower level metrics are aligned and communicated from the program through the PSI to the PSP. The arrangement execution is ultimately dependent on the continual communication and management response to performance against the metrics.

2.4.3. Conclusion

Once the desired performance outcome and associated metrics have been defined, the PSM will analyze alternative courses of action to deliver the desired outcome (Step 5). The performance outcome as quantified in the selected metrics will also influence the arrangement pricing and incentives detailed in Step 11.

2.4.4. Concepts in Action: Generic Subsystem Use Case

Based on the results of Step 3, the PSM determined that a PBL arrangement is feasible. The diagnostic highlighted the potential for incentivizing the OEM to improve supply availability for the six long-lead time components, and encouraging the OEM to institute reliability improvements that will eventually lead to savings for the Government.

The PSM's next step was to identify the appropriate performance metrics. The GSS PMO could pursue two different outcomes for availability: a defined level of supply availability or a requirement that parts be delivered within a specified amount of time.

The PSM IPT selected the second option. The first option would require giving the OEM greater control over inventory levels, and the PMO frequently receives reserve stock requests that impact inventory levels. It is important to select an outcome over which the product support provider has control, so that the provider can be held responsible for achieving that outcome. For GSS, the Government will purchase an outcome that requires the OEM to shorten the amount of time between logistics demand and delivery of parts. Specifically, Customer Wait Time (CWT) was chosen, defined as the time from requisition to receipt of items.

The GSS PMO also selected MTBF as a metric for the six components included in the arrangement. Since these six components drive 75% of the subsystem failures, the program chose metrics tied to improved reliability. The OEM was delegated authority to affect reliability of these component parts for improved performance at the subsystem level. Including MTBF as an arrangement metric ensures that the system's actual reliability is maintained or improved. This precludes the OEM from meeting the CWT requirement with less reliable components by introducing more assets into the inventory. Doing so would negatively impact maintenance hour per operating hour, transportation, and warehousing needs, etc., and drive up cost. Figure 11 displays how these chosen metrics—CWT and MTBF—are oriented by platform level and across the scope of support needed.

Step 4: Developmental System Considerations

PSM efforts for developmental systems include:

- Ensuring sustainment requirements are part of design considerations and establishing metrics for monitoring the design's ability to meet them
- Prioritizing metrics based on their influence in producing a suitable (e.g., reliable, maintainable, and affordable) design and acquisition strategy that facilitates performance-based arrangements when fielded
- Participating in design reviews, monitoring, and influencing sustainment metric projections based on the evolving design
- Developing a product support plan based on design needs along with risk mitigation strategies should the estimates indicate the suitability metrics thresholds are not likely to be met
- Participating in test reviews and monitoring the ability of the design to meet the sustainment metrics and deployment

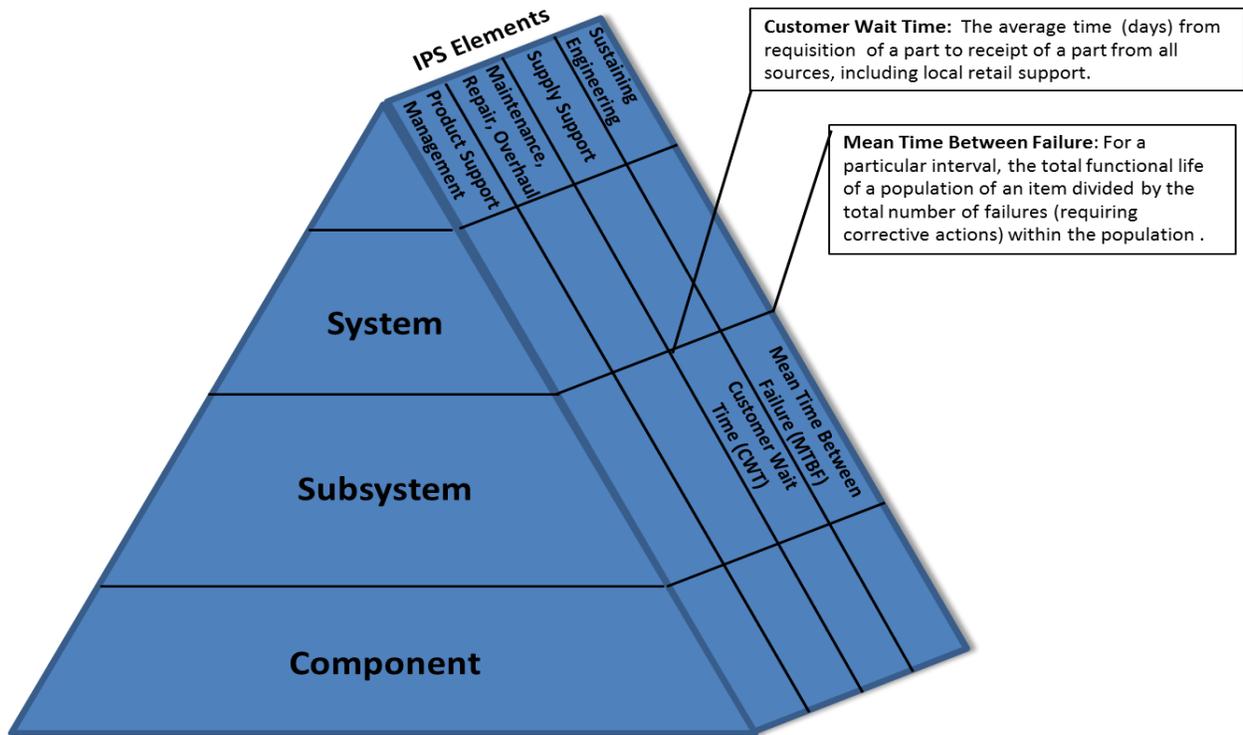


Figure 11: Generic Subsystem Metrics by Level and IPS Elements

2.5. Step 5. Business Case Analysis

2.5.1. Introduction

United States Code (USC) Title 10 Section 2337 provides requirements for assignment of a PSM for each major weapon system and identifies core PSM responsibilities. They include:

- “(A) Develop and implement a comprehensive product support strategy for the weapon system
- (B) Use appropriate predictive analysis and modeling tools that can improve material availability and reliability, increase operational availability rates, and reduce operation and sustainment costs
- (C) Conduct appropriate cost analyses to validate the product support strategy, including cost-benefit analyses as outlined in Office of Management and Budget Circular A-94”

This step and the subsequent two steps provide the PSM with an analytical method to achieve the requirements defined in statute.

2.5.1.1. Use of the Term “Business Case Analysis”

Business Case Analysis (BCA) is commonly used within DoD, including as Step 5 of the DoD Product Support Strategy Process Model. As such, the phrase ‘BCA’ appears throughout this document. Examples of similar terms are “cost benefit analysis,” “product support analysis,” “analysis of product support alternatives,” and “economic analysis” among others. **In this guidebook, the term Business Case Analysis (BCA) is not intended to mandate a specific methodology or level of analysis. Any analysis discussed here is intended to be tailored to the needs of the program and the nature of specific product support decisions.** The PM/PSM should identify the appropriate analytical methodology for their program and include in any methodology an assessment of cost, benefits, risk, and sensitivity to changes in the available support alternatives.

2.5.1.2. Purpose of Analysis

The PSM is responsible for developing the best product support strategy considering costs, benefits and risks to the program and Service. The PSM should perform appropriate analysis of the product support alternatives to inform the PM of costs, benefits, and risk implications of the alternatives. The analysis is not the sole determining factor as other factors (such as legal compliance, balancing organic and contractor support for a healthy industrial base, and so forth) influence the selection of the product support strategy.

The analysis is a structured methodology that identifies and compares product support alternatives by assessing mission and business impacts (both financial and nonfinancial), risks, and sensitivities. The analysis should produce clear distinctions among the alternatives to support the program’s selection of one. It should give a clear comparison of each alternative in terms of cost, benefits, and risk to aid the PM in selecting the alternative that meets Warfighter requirements at lowest O&S cost. The analysis should not be performed just to validate a predetermined solution. The PSM may determine outside assistance (either Government or commercial source) is required depending on the complexity of the weapons system or potential support arrangements. However, the PSM retains responsibility for the analysis conduct and recommendation for a specific PSA.

2.5.1.3. No “One-Size-Fits-All” Analysis

This step and the subsequent two steps provide best practices that employ a sufficient level of analytical rigor so that the PM/PSM, Service Acquisition Executive (SAE), Milestone Decision Authority (MDA), and other relevant stakeholders are confident in the product support plan. Throughout Steps 5-7, the methods and analysis displayed in these sections anticipate the highest cost, most complex, and highest risk programs. For programs or situations where less analysis is required, the analysis and methodology should be condensed or eliminated as appropriate.

2.5.2. Process

The BCA process is described in the DoD Product Support BCA Guidebook.²¹ The analysis may be tailored to lower levels of cost, complexity, and risk, based on the program’s unique needs. The subsequent subsections provide detail on BCA scope, partnership considerations, and alternative development.

2.5.2.1. Scope

The scope of the analysis should focus on the alternatives, clearly identifying the boundaries for the product support alternatives and corresponding analyses. The DoD Product Support BCA Guidebook lists the primary influences on the BCA scope:

- Time and schedule
- Cost/Benefit
- Organizations
- Functions and positions
- Geographic areas, sites, and locations
- Technology
- Peace vs. wartime operating environment

The scope should rely on the product attributes and support elements evaluated in the baseline (Step 3). For example, the baseline identified specific IPS elements that drive increased sustainment costs or lower system performance. The baseline should have also identified which sustainment activities have beneficial cost and performance impacts to ensure the alternatives do not undermine these activities.

The scope should also account for constraints under which a potential PBL arrangement must function (e.g., restrictions to technical data and USC Title 10 section 2464 and 2466 requirements). The BCA alternatives will define the relationship(s) between Government and commercial PSPs. Thus the analysis should include consideration of partnership relationships and the type of arrangement between providers.

2.5.2.2. Partnership Considerations for PBL Alternatives

2.5.2.2.1. Background on Partnerships for Sustainment

²¹ <https://acc.dau.mil/bca-guidebook>

A PPP is a cooperative arrangement between a public product support provider and one or commercial product support provider utilizing DoD facilities and equipment. Partnerships enable a collaborative relationship that leverages the unique capabilities and capacities of Government and industry. A partnership assessment is a useful tool in defining executable alternatives for both development and fielded systems.

DoD Directive 5000.01 mandates the use of PPPs to ensure the best public and private sector resources are used for sustainment.²² DoD Instruction 4151.21, “Public-Private Partnerships for Depot-Level Maintenance,” promotes PPPs to improve the cost effectiveness of sustainment strategies or maximize the use of Government resources. Legal authorities, including USC Title 10, allow Government and nongovernmental entities to enter into partnerships for sustainment and govern the structure of partnerships. For example, 10 USC § 2464 requires DoD to maintain a core logistics capability of personnel, equipment, and facilities for systems subject to core law that are Government-owned and Government-operated. In addition, 10 USC § 2466 states that no more than 50% of the funds made available to a Service for depot-level maintenance may be used to contract nongovernmental personnel. Similarly, 10 USC § 2474 authorizes the Secretaries of each Service to designate depot-level activities or military arsenal facilities as Center of Industrial and Technical Excellence, and encourages the head of the Center to enter into public-private cooperative arrangements.

PBL Leading Practice(s)
 When considering potential partnership opportunities, understand the regulations that govern DoD PPPs, and examine Service-specific policies that may affect PPPs.

Partnering arrangements are key to forming the PBL alternatives; these arrangements may be structured as workshare, direct sale, or leasing arrangements (Table 16).

PPP Arrangement Types	Description
Workshare agreements	Partnerships where responsibility for sustainment activities is divided between the public and private providers and managed by the PMO or other Government entity
Direct sale arrangements	Partnerships whereby public organizations enter into a contract for the sale of sustainment products or service with a private organization
Leasing arrangements	Partnerships where a private organization accesses Government facilities or other resources

Table 16: Types of Partnerships to Consider for PBL Alternatives

One proven PBL partnership arrangement includes the organic depot providing skilled depot touch labor and serving as a supplier to the industry PSI. The PSI manages the repair process, provides piece part support, and assists the organic depot with incorporating commercial

PBL Leading Practice(s)
 Consider various forms of partnerships as part of the analysis of alternatives, and examine the impact they have on the outcome.

²² DoD Directive 5000.01 states, “Sustainment strategies shall include the best use of public and private sector government/industry partnering initiatives, in accordance with statutory requirements.”

best practices. The organic depot artisans physically do the repairs, utilizing labor funding provided by the PSI. Partnerships, such as the one described above, are an effective use of depot expertise that allow sharing of best practices, while satisfying statute on organic depot repair capability and workload.²³

2.5.2.2.2. PBL Partnership Assessment

Options for PBL partnerships should deliver the performance outcomes determined in step 4. The assessment determines the scope of partnership alternatives. Figure 12 depicts a partnership assessment, which consists of an ordered set of considerations that must be met for a partnership to be feasible and beneficial.

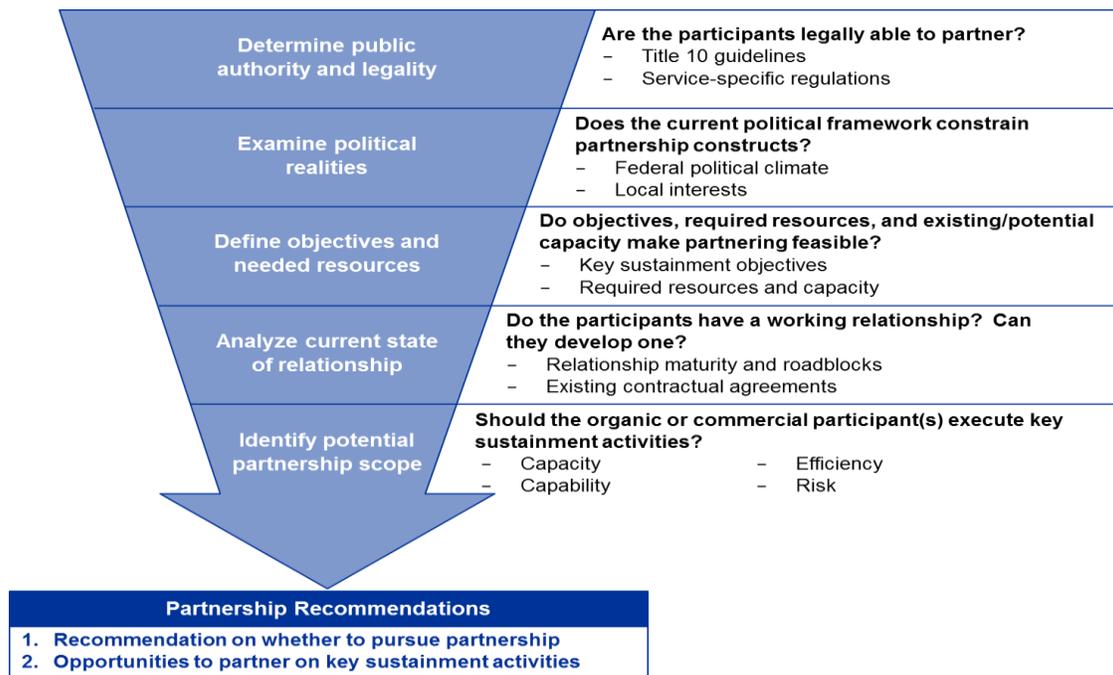


Figure 12: PBL Partnership Assessment

Considerations that should inform the formulation of partnership options include legality, political acceptance, sustainment objectives alignment, constructive relationship, and scope. The PSM IPT should analyze the performance of past arrangements, current contractual negotiations, intellectual property status, and other issues that may affect the partnership.

A method to determine the scope of potential partnerships is to evaluate Government and industry providers by sustainment activities and their aptitude to perform those sustainment activities. Provider aptitude can be measured by criteria such as capacity, capability, efficiency, and risk. In Table 17, the definition of each term is listed.

Criteria	Key Considerations
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²³ Additional information can be found in the DoD PPP for Sustainment Guidebook at <https://acc.dau.mil/ppp-guidebook>

Capacity	The amount and availability of resources required to conduct a sustainment activity
Capability	Each participant’s skill and ability to conduct an activity
Efficiency	The cost incurred for a participant to conduct a sustainment activity relative to the other participants and industry standards
Risk	The potential for a participant to fail at or cause harm while conducting a sustainment activity

Table 17: PBL Partnership Scope Assessment Criteria

After this partnership evaluation, a PM can identify the relative strengths of each participant, leading to recommendations of mutually beneficial partnership options for the PBL alternatives. For more information on partnerships, the PSM IPT may refer to the Public-Private Partnering for Sustainment Guidebook.

2.5.2.3. Alternative Development

The PSM will use the baseline (step 3), performance outcomes (step 4), scope, and partnership options to determine a manageable number of alternatives to analyze. The analysis will ultimately help the PSM define appropriate PBL arrangements to execute the selected alternative.

PBL arrangements will need to be adjusted in scope based on the performance requirements. For instance, a system failing to meet performance requirements due to availability of parts in which the root cause has been assessed as supply support, should consider a PBL arrangement focused on supply support. Similarly, a system facing significant issues with parts reliability should implement a PBL that includes reliability improvement and sustaining engineering activities. These root causes of performance deficiencies should be apparent once the system baseline is determined (step 3).

Alternatives considered for analysis should be few enough in number to be manageable and should display sufficient differences rather than be variations of the same solution. The analysis of distinct alternatives (typically two to four options) should yield clear differences in costs, benefits, and risks. Alternatives for fielded systems should include the “As-Is” strategy. For developing systems, there is no “As-Is” strategy. Alternatives should represent different methods and providers of product support, and should appropriately consider the constraints/opportunities afforded by the systems current Intellectual Property environment. Table 18 highlights specific considerations for circumstances in which IP ownership does and does not exist, while Figure 13 provides guidance to evaluate IP ownership when analyzing specific COAs.

Insights for Success
<p>A successful PBL sustainment arrangement is one that is not only feasible but also executable by the Service (<i>alternatives a PSM or Service is willing to implement</i>).</p>

Intellectual Property in the Spotlight
Fielded Systems: Post Milestone “B” Considerations

<p>I.P. Ownership Exists</p>	<p>Costing Considerations</p> <ul style="list-style-type: none"> • In cases where the Government owns the IP, the historical acquisition costs should be considered as “sunk costs” and should not be included in the quantitative analysis of COAs or selection of the provider (organic or commercial) • All activities pertaining to IP maintenance/sustainment costs should be included in the quantitative analysis (organic or commercial) <p>Strategic Considerations</p> <ul style="list-style-type: none"> • An integrated data environment that controls and manages data from design to disposal (as designed; as built; as maintained) is an important facet of ensuring the integrity of systems data as it evolves. • When considering a PBL arrangement where you already have some level of ownership of/access to IP (technical data such as maintenance manuals, engineering spec’s, design drawings, and computer software such as programs and source code, etc.), it is important to ensure you properly evaluate what it is you own/have access to, and the degree to which such IP has been maintained. <ul style="list-style-type: none"> ○ What data rights do you have? ○ Is what you have current/up to date? ○ What level of maintenance data (operational, intermediate, depot) do you have?
<p>I.P. Ownership does not Exist</p>	<p>Costing Considerations</p> <ul style="list-style-type: none"> • In cases where the Government does not own the IP, the cost of acquiring the IP, IP licenses, etc., will be included in the quantitative analysis of the COAs where an IP purchase or license are contemplated <ul style="list-style-type: none"> ○ All activities pertaining to IP maintenance/sustainment costs should be included in the quantitative analysis if acquiring IP is being contemplated <p>Strategic Considerations</p> <ul style="list-style-type: none"> • Potential ownership of IP is just one of the numerous factors that must be considered in developing and analyzing courses of action. • When preparing the various COAs, it is important to understand the extent or level of IP ownership/access to make each COA viable. <i>To support this COA...</i> <ul style="list-style-type: none"> ○ Do I need to own the IP outright or just have a license to use it? ○ Do I have a specific format in which I need to receive the data? ○ Do I need this IP for Government use only, or for potential dual source opportunities through a third party logistics provider? ○ Do I need maintenance level data or do I need production level information?

Table 18: Intellectual Property Spotlight

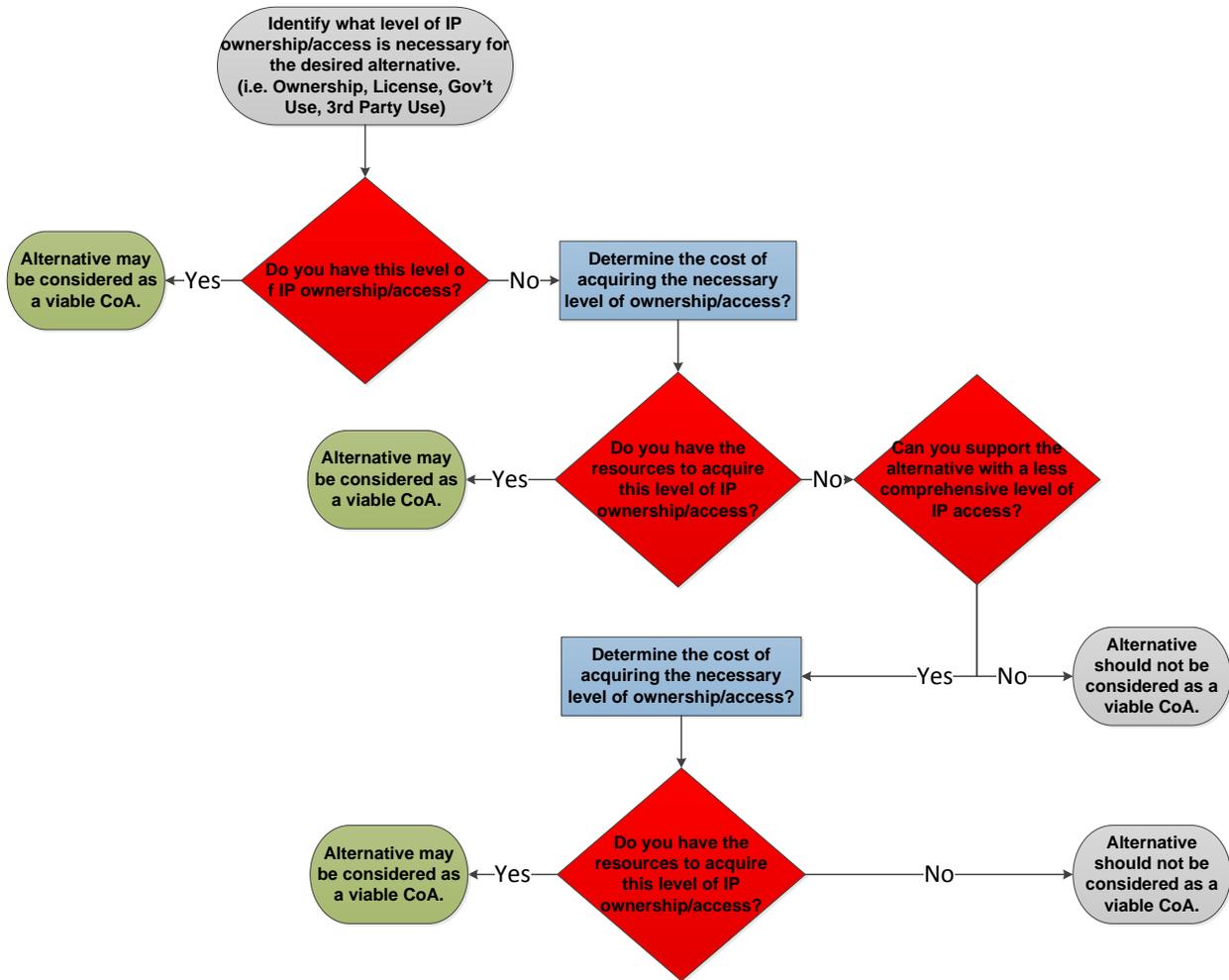


Figure 13: Intellectual Property Decision Tree

Alternatives should be developed in sufficient detail to differentiate among alternatives, but they may be further developed during the analysis of financial and nonfinancial impacts. While enough information is needed to reasonably estimate the costs, benefits, and risks of each alternative, some level of ambiguity in the sustainment process may still be present at this point.

2.5.3. Conclusion

After completing Step 5, the PSM IPT will have finalized the scope of the analysis and will have developed the list of performance-based alternatives to be considered. Alternatives include partnership options from the partnership assessment. Analysis of the alternatives to quantify the costs, benefits, and risks is the focus of step 6.

2.5.4. Concepts in Action: Generic Subsystem Use Case

The GSS team has completed Step 5. Using the results of Step 3, the team identified key product support characteristics that shaped the scope of analysis, including sustainment issues and opportunities. Specifically, the GSS team concluded that Materiel Availability for the GSS had been degraded due to parts availability. The Military Service has not had enough LRUs available, in operable condition, to replace those that fail because the failure rate has exceeded the rate at which GSS LRUs are procured and/or repaired. Without these replacement parts, when a GSS fails, the larger system is mission incapable until the requisite GSS LRUs can be located to return the GSS to a functioning state.

Step 5: Developmental System Considerations

The absence of actual data on cost or performance limits the effectiveness of the BCA process for systems that are pre-milestone C. The PM/PSM must use the limited information available to make decisions about the program's sustainment strategy. This limited information would also impact the alternatives development, as there will be no "as-is" state. Instead, the various alternatives will be benchmarked against theoretical data or analogous data from a similar fielded weapon system. A Partnership Assessment should also be conducted in order for the team to consider only feasible alternatives.

The GSS availability problem was attributed primarily to the long procurement lead times for GSS LRUs. The GSS team sought to develop alternatives for the subsystem that would address availability issues while reducing the overall cost of sustainment. The team explored alternatives at the LRU level and subsystem level, focusing on support integration, technical services, supply support, and improved fault identification within the maintenance process.

After conducting an assessment of partnership opportunities, the team determined that the GSS sustainment strategy could benefit by including partnering in the alternatives. The OEM owns the Technical Data Package (TDP) for six of the 10 repairable components, including the six with the longest lead times. The OEM is considered the primary option for partnering, though other third-party logistics suppliers were considered for product support integration.

The scope of the partnership included various aspects of maintenance planning and management, supply support, and product support integration. The majority of maintenance activities were recommended to remain organic. Additionally, since the organic intermediate repair points and depot facilities have excess capacity, the commercial provider used these facilities to conduct fault verification activities onsite prior to shipment to the OEM depot repair facility.

Through GSS's partnership, commercial Field Service Representatives (FSRs) could receive GSS LRUs and components at locations to conduct fault verification, testing, and minor maintenance. The OEM has significant supply chain capabilities and experience that could partner with organic facilities and labor to create efficiencies and reduce LRU lead time. A provider could utilize DLA facilities for supply warehousing and distribution activities.

The domain of feasible sustainment strategies was narrowed down to three alternatives during the course of the alternative development. Because GSS is a developed system, Alternative 1 is the "As-Is" product support approach.

2.5.4.1. Generic Subsystem Use Case: BCA Alternatives

Alternative 1 – Current Transactional Approach

In Alternative 1 – the current state alternative – GSS maintains the current transactional process in which each failure requires an individual repair agreement. The Government continues to purchase individual repairs for the LRUs. Each broken repairable is returned to the program logistics center for further routing to the Contractor facility and then to other internal facilities or subtier suppliers for repairs. Maintenance for the GSS subsystem is conducted organically. The GSS supply chain is managed by the PMO with the DLA. Repairable components are managed by the sustainment command, while most consumables parts are managed by the DLA. However, procurement is executed for both repairable components and consumable parts by the DLA.

Alternative 2 – LRU-Level PBL

Under this arrangement, the Government purchases a specified level of LRU availability for GSS repair. The provider is responsible for ensuring the availability of repair parts for the GSS at the intermediate repair points and at the wholesale inventory control points for use by the two depot locations. The goal is to have repair parts, on the shelf, available for installation into the GSS. This arrangement includes the provision of commercial FSRs based in the two depot locations; and at the intermediate repair points to perform testing and minor repairs, and to route repairables requiring additional action. This arrangement shifts significant procurement, packaging, handling, shipping, and transportation responsibilities to the commercial provider. Program expects this arrangement will streamline contracting processes and reduce lead times.

Unlike Alternative 1, the supplier would be incentivized under this arrangement to provide desired performance through improvements to the system or to the supply chain, including incentivizing its subtier suppliers.

Alternative 3 – Subsystem-Level PBL

The Government would purchase a specified level of availability for the total GSS. The provider is responsible for the availability of the GSS. The subsystem must be available when the system is activated. Similar to Alternative 2, the arrangement will include the provision of commercial FSRs based in the two depots and at the intermediate repair points to perform testing and minor repairs. Implementing this arrangement involves establishing a commercial provider as the PSI.

By delegating subsystem performance responsibility to the PSI, the PSI/PSPs have the ability to apply innovation and improved process where required (e.g., training, tech data, sustaining engineering), versus just LRU time definite delivery. This directly ties the PSI to the operational performance of GSS and has the potential to deliver a better outcome for the Warfighter. The interests of the provider, the PMO, and the Warfighter would be fully aligned under Alternative 3, with GSS availability as the primary focus.

2.6. Step 6. Product Support Value Analysis

2.6.1. Introduction

Once alternatives are defined to sufficient detail to support analysis, the next step is to quantify the relative costs, benefits, and risks. The analysis of product support alternatives includes both financial and nonfinancial considerations, and quantifiable and non-quantifiable elements. The analysis may also include evaluation of performance, reliability, maintainability, and supportability. Programs may place different levels of importance on cost, benefits, and risks in the use of these factors in their decision. Assigning numerical weights that emphasize or suppress the relative influence of cost, benefits, and risks, on the analysis is one way the program can better shape the analysis to support its decision making. In order to conduct the analysis of the alternatives, the weighting (proportional value assigned to a specific benefit), benefits, and risks need to be further defined. The PSM IPT's ability to effectively perform this analysis is greatly enhanced when a cost estimating subject matter expert is on the team.

If the MDA, PEO, or PM determines that least cost is the overriding decision criteria, this can be incorporated into the analysis by setting the cost weight at a high value. However, cost, benefits, risk, and sensitivity should be components of any analysis of product support alternatives.

2.6.2. Process

Value analysis of potential product support alternatives evaluates three primary criteria: **Costs (2.6.2.2), Benefits (2.6.2.3.), and Risks (2.6.2.4.)**.²⁴ The decision for how to value the potential tradeoff between costs and benefits, benefits and risks, and costs and risks is one that the PSM IPT – and ultimately the PM/PSM – will need to make based on the unique requirements and characteristics of their program. This section provides a methodology to quantify the weight of each criterion to reflect its relative importance for the PM in defining the product support strategy. Regardless of the relative importance each is given, the expected costs, benefits, and risks of each potential product support alternative should be considered. The sections that follow list analytical approaches for each criterion, beginning with the weighted criteria or utility approach to analysis (2.6.2.1), followed by cost, benefit, and risk analyses. Although there are other methods for performing a product support value analysis, this method provides a straightforward, comprehensive approach for quantifying the potential value from each alternative.

2.6.2.1. Utility Approach to Analysis

This method yields a single numerical score or Utility Score for each alternative, determined by multiplying predefined weights by the quantified results of the cost, benefit, and risk analyses. The PM may use the Utility Score to aid the PM in deciding the best option among the product

²⁴ BCAs (or other economic analyses) should consider cost factors and no cost factors in the determination of a Best Value Alternative (BVA). In some cases, PM's have an explicit objective to focus only on one factor, for instance determining to choose a product support alternative strictly based on the lowest cost. However, even in cases where cost is the overriding concern, it is recommended that the PM give at least some explicit consideration to no cost factors such as benefits and risks (obviously, implicit consideration is already given, as the PM would not consider an alternative that would lower benefits or raise risks to the extent that system requirements were in jeopardy). Often, no cost factor are broken into benefits and risks, as described above.

support alternatives identified in step 5. A sample Utility Score calculation for the Generic Subsystem is included later in this section. Figure 14 depicts the approach for utility scoring.

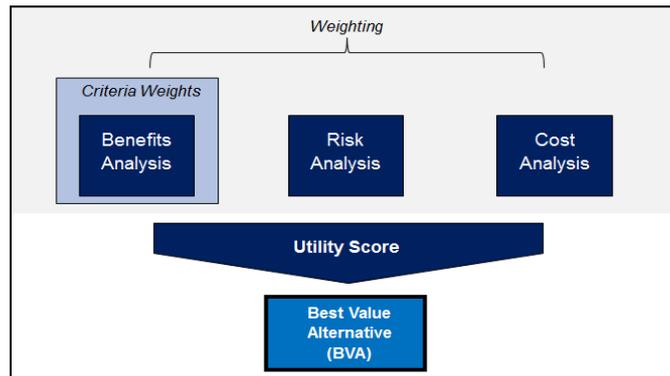


Figure 14: Approach for Utility Scoring

The PSM IPT plays an important role in establishing the relative importance of the criteria through the chosen weights. Establishing specific values through team discussions may be facilitated by using pairwise comparisons. A pairwise comparison is one mechanism for determining how to evaluate alternatives by providing a way to rate and rank decision-making criteria. Figure 15 displays the use of a pairwise comparison to establish relative numerical weightings between two criteria. In this example, cost is compared to benefit on a scale from -9 to 9. Assigning a value of ‘-9’ on the left indicates that cost is nine times more important than benefit. Zero indicates neutral importance between the criteria. A value of ‘9’ on the right indicates benefit is nine times more important than cost.

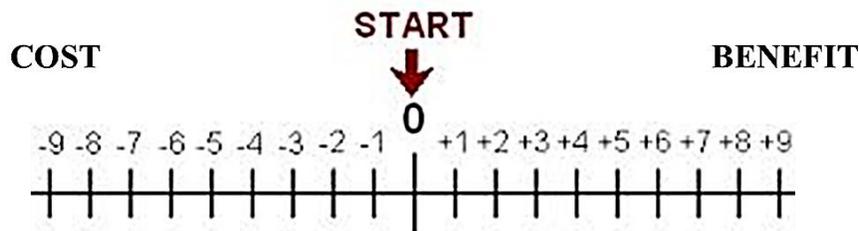


Figure 15: Pairwise Comparison

The values determined through pairwise comparisons can then be algebraically normalized to 100 percent to arrive at the relative weights among the three criteria. For a detailed example demonstrating how to translate pairwise comparison votes into criteria weights, see Appendix G. Figure 16 lists the relative cost, benefit, and risk weights used for the Generic Subsystem.

PBL Leading Practice(s)
Weights must be established prior to beginning the analysis to ensure their use is objective.



Figure 16: Generic Subsystem Cost, Benefit, and Risk Weights

2.6.2.2. Cost Analysis

The cost analysis must be performed with the sufficient data, appropriate scrutiny, and comprehensive documentation. Cost analysis for product support alternatives should be conducted in accordance with applicable directives and guidance. The Cost Estimate and Program Evaluation (CAPE) and Service cost estimating agencies have published guidance to assist in developing cost estimates.²⁵ This Guidebook emphasizes those aspects of the cost estimates unique to product support alternatives.

2.6.2.2.1. Cost Estimation Scope and Approach

The objective of the product support cost estimation is to compile and forecast the cost to perform the required product support tasks for each alternative during a specified period of performance. Once compiled, the estimates for each alternative can be compared and included among the other criteria in determining Utility Scores.

The level of detail for the cost estimates must be balanced between the accuracy and precision needed to discriminate among alternatives and resources, and time available to conduct the estimate. The following questions will help the PSM scope the cost estimate:

- Is it necessary to determine all costs or only costs that differentiate among alternatives?
- What structure should be used to identify estimated sustainment costs?
- What ground rules and assumptions are included in the analysis?

The cost estimates for the alternatives under evaluation should consider the entire life cycle of the system, subsystem, or component to ensure their utility during the expected period of performance for associated PBL arrangements. Cost estimates should be realistic and comprehensive, and not filtered based on budget appropriations. However, the degree of comprehensiveness should emphasize those costs that help discriminate among the alternatives. The PSM IPT may choose to disregard sunk costs, nonincremental costs, and nondifferentiating costs. However, all costs—sunk costs, nonincremental costs, and nondifferentiating costs—should be added back in the final budget estimates to ensure a full accounting is considered.

The costs should be appropriately phased by year, and discounted appropriately to support expressing the estimate in Net Present Value (NPV) terms.

2.6.2.2.2. Selecting a Cost Element Structure

A consistent cost structure will ensure that the estimates for the different alternatives can be effectively compared. The CAPE Cost Elements (for ACAT I/IAs) structure used throughout the DoD cost community will help the PSM IPT develop cost estimations. The potential cost drivers for each program may vary, but they can be consistently categorized for comparison among alternatives using the IPS element structure.

²⁵ Appendix H contains a list of DoD and GAO Cost Estimation resources.

There are many variables that may be considered when conducting the cost analysis. Table 19 lists common differentiating cost drivers and cost estimating considerations for product support alternatives.

Cost Drivers	Cost Estimate Considerations
Inventory Costs	<ul style="list-style-type: none"> Estimates the costs of keeping and maintaining inventory in storage under different alternatives. Examples of holding costs include the physical space, insurance, security, opportunity cost of capital, and damage. The simplified inventory management model is grounded on the “safety stock policy” to predict average inventory on hand, safety stock, and holding costs. The minimum fill rate should be calculated for each of the alternatives.
Shipping and Packaging Costs	<ul style="list-style-type: none"> If shipping and packaging processes vary greatly between the Alternatives, this could be a major driver of total cost. If storage and handling processes vary greatly between the Alternatives, this could be a driver of total cost.
Repair Costs	<ul style="list-style-type: none"> Estimates the future costs of the repairs to the LRU repair costs. Major considerations include expected LRU repair volume and cost of repair parts. Repair volume is often the driver that most differentiates the Alternatives. A key component in LRU repair volume is assumptions for reliability improvements of individual LRUs. These assumptions may differ based on the Alternatives. May include costs from units sent for repair, but show NEOF, if applicable. Obsolescence management costs should also be considered, if applicable.
Contractor Labor Costs	<ul style="list-style-type: none"> Estimates the provider FSR labor costs for each Alternative.
Repair Processing Costs	<ul style="list-style-type: none"> Calculates the processing costs to the Government and provider.
Training Costs	<ul style="list-style-type: none"> Training costs among alternatives may vary and require significant amounts of process redesign and/or new individuals to conduct portions of the product support process.

Table 19: Cost Drivers and Cost Estimate Considerations for Product Support Alternatives

2.6.2.2.3. Methodologies

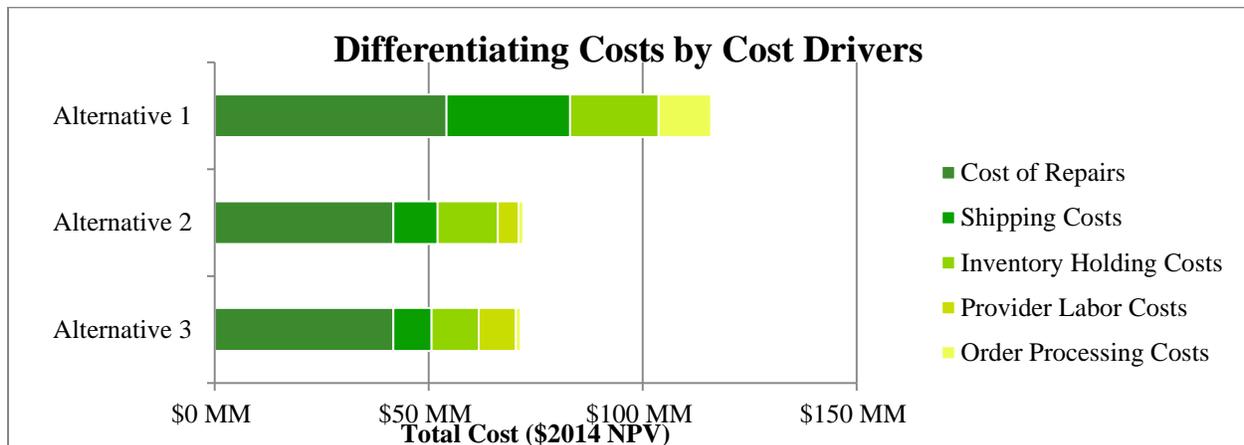
Cost estimation employs five commonly used methodologies: actual data, engineering analysis, analogy, parametric, and expert opinion.²⁶ The use of actual system data is the preferred method for developing future cost estimates and should be used when possible. When actual data is not available – as is often the case for developmental systems – cost estimators must use another approach. Table 20 provides explanations of the five commonly used methodologies. Additional information on cost estimation methodologies can be found in Appendix H.

Cost Estimation Methodology	Description
Actual Cost Data	Actual cost data from the program being evaluated
Engineering Approach	Use of separate cost data at a lower, more detailed level that can be aggregated into an estimated total cost (Also called the “Bottom-Up” Approach)
Analogy Approach	Use of cost data from a similar platform that is a direct and reasonable comparison for the system being evaluated
Parametric Approach	Use of physical attributes or performance characteristics of the alternatives and their relationships to highly aggregated component costs to create a parametric estimate of an alternative’s cost
Expert Opinion Approach	Use of judgment from an experienced individual or group; use should be limited to cases when data for other approaches is not available; assumptions should be documented

Table 20: Cost Estimation Methodologies

2.6.2.2.4. Interpreting Cost Analysis

Once the PSM IPT has developed cost estimates for the alternatives, the team should analyze the results to identify the drivers of cost that contribute most significantly to the differences among the alternatives. Figure 17 depicts the estimated cost differentiation among the three Generic Subsystem alternatives. The estimates consistently assumed 20 years as the remaining operation of the system.²⁷



²⁶ Refer to the OSD Product Support BCA Guidebook for more description of Cost Estimation approaches.

²⁷ While the cost Figures shown in Figure 14 are hypothetical, they are representative of those found in a real cost analysis of an actual subsystem.

Figure 17: Cumulative Costs by Cost Drivers

The cost analysis shows that Alternatives 2 and 3 are less expensive than Alternative 1 (the “As-Is” product support state) for all cost drivers except provider labor costs. Alternatives 2 and 3 cost less than Alternative 1 by \$44 million and \$45 million, respectively. Costs savings appear possible in the costs of repairs, shipping costs, inventory holding costs, and order processing costs. The cost savings are possible due to lower expected volume of LRU repairs, supply chain efficiencies, and reliability improvements. The potential savings from Generic Subsystem shifting to either Alternative 2 or 3 from Alternative 1 indicate the cost criteria favors transitioning to a PBL arrangement.

The PSM IPT should consider estimating costs for the next two, three, five, and 20+ year horizon (or for the end of the system life cycle when it is less than 20+ years) in order to evaluate long-term cost fluctuations among alternatives.

2.6.2.3. Benefits Analysis

The benefits analysis should consider the alternative’s potential to satisfy Warfighter requirements and potential benefits to the Service and the U.S. Government. PMs may find it helpful to answer the following questions as they compare the benefits of different alternatives:

- **Identify Benefits Evaluation Criteria:** What are the most important benefits expected to come from the PSA?
- **Consider Criteria Importance:** How important are the different criteria relative to each other?
- **Evaluate Criteria:** For each criterion, how much benefit is each alternative expected to provide?
- **Compare Benefits across Alternatives:** Considering all criteria, which alternative provides the greatest expected benefit?

The PSM IPT helps provide the PM with answers to these questions to help distinguish among the product support alternatives. To evaluate benefits with costs, the PSM IPT must ultimately quantify benefits in a manner that supports a direct numerical comparison; how to do this is the focus of the next section.

2.6.2.3.1. Benefits Evaluation Criteria

Benefits analysis is typically based on the three to five most important benefit criteria, where the degree of importance is based on value delivered to the user or the department more broadly. Benefits criteria may be quantitative or qualitative. An example of a quantitative benefit is system availability, where the values assigned for each of the alternatives can be explicitly estimated. An example of a qualitative benefit is manageability, where the manageability of the product support is determined by the ease with which the product support is managed or controlled. The DoD Product Support BCA Guidebook lists nine benefits criteria categories that the PSM IPT should consider (Table 21). A program may choose to establish additional criteria specific to its product support strategy or decompose the criteria to support more precise analyses.

Benefits Evaluation Criteria Categories ²⁸	
Availability	Manageability
Reliability	Sustainability
Supportability	Versatility
Expected useful life of a weapon system	Affordability ²⁹
Operational tempo or contingency vs. noncontingency operations	

Table 21: Benefits Evaluation Criteria

The PSM IPT typically determines list of potential benefits criteria and defines each criterion to sufficient detail to support consistent and accurate measurement.

In the GSS example, Step 4 identified LRU-availability as a sustainment performance degrader, with the ultimate effect of reduced subsystem availability. As such, the PMO chose to include GSS Material Availability as a benefit criterion. Similarly, the program identified reliability as a performance outcome and included it as a benefit criterion. Finally, the GSS team included a third benefit criterion, Long-Term Manageability. The resulting benefits criteria included: 1) Materiel Availability, 2) Reliability, and 3) Long-Term Manageability.

2.6.2.3.2. Criteria Importance

Once the program identifies the benefits evaluation criteria it should establish the relative importance of each benefit. The weights may be determined through PM/MDA assignment, PSM IPT discussion or through a more rigorous means such as pairwise comparison. The result will be a weight for each criterion, normalized to 100%. Figure 18 lists the weightings used for the GSS. The program chose to develop these values using pairwise comparison evaluations performance at a stakeholder conference.³⁰



Figure 18: Generic Subsystem Evaluation Criteria Weights

These weights show that half of each alternative’s overall benefit score will be determined by how well it provides GSS materiel availability, while reliability and long-term manageability have equal influence on the evaluation of benefits.

2.6.2.3.3. Benefits Evaluation

In order to compare the value of the benefits to each other, the range of measured benefits should be mapped to a common scale. A scale, such as 1-10 (10 being most preferred, 1 being least

²⁸ Definitions for potential evaluation criteria can be found in the OSD Product Support BCA Guidebook.

²⁹ While affordability is listed in the OSD Product Support BCA Guidebook and can be considered as an evaluation criterion, it is often omitted from the Benefits Analysis and focused is in the Cost Analysis and Implementation Plan.

³⁰ For more information on scoring and weighting of evaluation criteria, refer to section 4.4.3 of the DoD Product Support BCA Guidebook.

preferred), allows the benefits scores to be combined into composite benefits scores for each alternative. These scores are then included in the Utility Scores.

When using a common scale to quantify benefits, the values on the scale should be defined so decision makers can base their judgments on a common scoring system. In Table 22, an example of such definitions is shown.

Rating	Availability	Reliability	Long-Term Manageability
10	~ 95%	~ 95%	Very Easy
9	~ 90%	~ 90%	Easy
8	~ 85%	~ 85%	Moderately Easy
7	~ 80%	~ 80%	Slightly Easy
6	~ 75%	~ 75%	Slightly Easy to Normal
5	~ 70%	~ 70%	Normal to Slightly Hard
4	~ 65%	~ 65%	Slightly Hard
3	~ 60%	~ 60%	Moderately Hard
2	~ 55%	~ 55%	Hard
1	X < 55%	X < 55%	Very Hard

Table 22: Sample Benefits Scale

The PSM IPT scores each criterion for the three Alternatives. Based on the team’s scores, each criterion receives an Average Stakeholder Rating on the 1-10 scale for every Alternative (this rating can be adjusted to account for assigning weights to different stakeholders’ opinions).

2.6.2.3.4. Compare Benefits across Alternatives

Once all scores have been collected, each alternative receives a weighted-benefit score by summing the criterion’s weight multiplied by its average stakeholder rating. Figure 19 depicts the method for calculating the weighted-benefit scores.

$$\text{Weighted – Benefit Score (Alt X)} = (\text{Criterion 1 weight}) * (\text{Criterion 1 score}) + (\text{Criterion 2 weight}) * (\text{Criterion 2 score}) + (\text{Criterion 3 weight}) * (\text{Criterion 3 score})$$

	Alternative 1			Alternative 2			Alternative 3		
	As-Is (Transactional)			PBL LRU-level			PBL GSS-level		
	A	R	M	A	R	M	A	R	M
Benefit Weight	50%	25%	25%	50%	25%	25%	50%	25%	25%
Average Stakeholder Rating (1-10 scale)	1.57	6.34	1.91	6.92	7.28	6.32	5.27	6.41	6.33
Calculation	.5(1.57) + .25(6.34) + .25(1.91)			.5(6.92) + .25(7.28) + .25(6.32)			.5(5.27) + .25(6.41) + .25(6.33)		
Weighted Benefit Score	2.8			6.9			5.8		
Benefit Rank	3			1			2		

Note: A: Availability R: Reliability M: Manageability

Figure 19: Alternative Benefit Ranking

In the Generic Subsystem example, Alternative 2 has the highest weighted-benefit score, indicating it is the most attractive alternative in the benefit analysis. Both Alternatives 2 and 3 offer benefits well exceeding Alternative 1. This benefit score will be incorporated into the overarching Utility Score for each alternative at the conclusion of this step.

2.6.2.4. Risk Analysis

Risk is an essential criterion the PSM should consider in evaluating product support alternatives. Cost and benefit analyses may indicate some alternatives are more desirable than others, but a relative risk assessment balances the PSM IPT's analysis of alternatives by considering the likelihood of achieving the promised estimated cost savings or performance improvement. For instance, implementing a new support method could result in operational delays, a large investment may not provide the expected performance improvements, or hiring lower cost labor may result in less skilled workers and slower process times.

Similar to the cost analysis and benefits analysis, the risk analysis should be tailored to the program's needs through PSM IPT deliberation. This section provides a method for identifying, evaluating, and characterizing risk inherent in each alternative and quantifying risk in a composite Risk score for each alternative. There are many risk assessment methods available to programs. Whether the PSM chooses the method presented in this section or an alternate, the analysis should consider potential risks to each alternative and incorporates those risks into the evaluation of the product support alternatives.

2.6.2.4.1. Risk Identification

When identifying risks, similar to the discussion of Benefits in Section 2.6.2.3, the risk analysis is intended to be a decision-making process, not an overly exhaustive process. The PSM should consider risks that bear directly on the alternatives under evaluation and focus the analysis on risks that are significant enough to discriminate among alternatives. While there is no set number of risks that should be considered, in general the most significant risks tend to be fewer than 10.

The DoD Product Support BCA Guidebook provides 10 classifications of risk that may aid in risk

identification. These classifications are intended to be used as a guide to assist the PSM IPT in identifying relevant risks. It is not necessary to identify risks in each category, nor should a PSM feel compelled to give rationale if a specific classification was not chosen. Table 23 lists these risk classifications.

PBL Leading Practice(s)

The PSM should drive the Risk Development process and receive input from appropriate PSM IPT stakeholders to address and mitigate risk.

Risk Classifications ³¹	
Business or Programmatic Risk	Schedule Risk
Operational Risk	Organizational Risk
Suitability Risk	Sustainability Risk
Process Risk	Safety Risk
Technical Risk	Environmental Risk

Table 23: Risk Categories

Table 24 lists the risks the GSS program identified in their risk analysis.

Risks		
ID	Classification	Description
1	Business/ Programmatic	If the selected sustainment arrangement is difficult to implement, then the full benefits may not be realized for an extended period of time.
2	Business/ Programmatic	If the provider fails to orchestrate the supply chain, then the desired performance may not be achieved.
3	Operational	If provider and/or Government contracting and legal approval processes remain lengthy, then maintenance may experience delays.
4	Process	If a lack of failure root-cause data continues, then the resulting inaccurate failure and demand forecasts may lead to excess inventory or reduced availability.
5	Schedule	If contract cost is above the threshold, then more thorough Defense Contract Audit Agency (DCAA) audits may be triggered, increasing the burden for program management and adversely impacting implementation.
6	Schedule	If the subtier suppliers continue to operate without a sense of urgency and/or responsiveness, thus requiring long lead times, then the longer RTAT may impact the ability to maintain readiness.
7	Sustainability	If costs exceed the expected costs for the alternative, then affordability may be a challenge.
8	Sustainability	If OPTEMPO changes and the selected alternative are not able to adjust, then there may be an increased risk of shortfall or inefficient funding and/or an impact to readiness.

Table 24: List of Risks for Generic Subsystem

2.6.2.4.2. Risk Evaluation

Not all risks to product support are created equal. Among the questions the PSM might ask to better understand the relative impact of risks are:

- Why were these areas chosen?
- Why were the risks categorized this way?
- Why were they scored this way?

³¹ Definitions for these risk categories can be found in the OSD Product Support BCA Guidebook.

Once the PSM has identified the list of significant risks to product support, the analysis should focus on evaluating the severity of each risk. Among the questions that may help with evaluating risk severity:

- Which of the identified risks does the PSM think is the most important?
- Which of the alternative’s risks are most likely to occur or are most severe?

There are several different approaches for depicting the results of the risk analysis. The PSM should determine the method that best communicates the results of the analysis and facilitates the program’s decision to pursue a specific product support alternative. One method to evaluate the relative severity of different risks is a Risk Matrix. A Risk Matrix considers each risk on a 1-5 scale based on its two main characteristics: Likelihood of Occurrence (or Probability), and Impact (or Consequence), if the risk is realized. Figure 20 depicts a Risk Matrix.

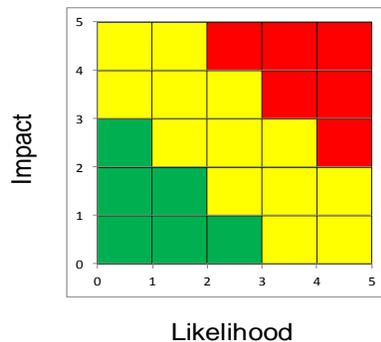


Figure 20: Risk Matrix

The Risk Matrix allows the PSM and the PSM IPT to present risks in a manner that facilitates the comparison of different risks across different alternatives. The matrix also facilitates communication with the PM and external stakeholders because it is used among many acquisition functional areas. In the Generic Subsystem example, the PSM IPT used the Risk Matrix to determine the expected likelihood and impact of eight identified risks under each alternative. For each alternative, the PSM IPT should score the identified risks in the following categories. Figure 21 depicts the likelihood and impact scoring of Generic Subsystem’s risks in a Risk Matrix.

- **Likelihood:** On a 1-5 scale, what is the likelihood that Alternative 1 will experience implementation challenges that affect overall product support?
- **Impact:** If implementation challenges do occur, on a 1-5 scale how severe do you expect the impact to be under product support Alternative 1?

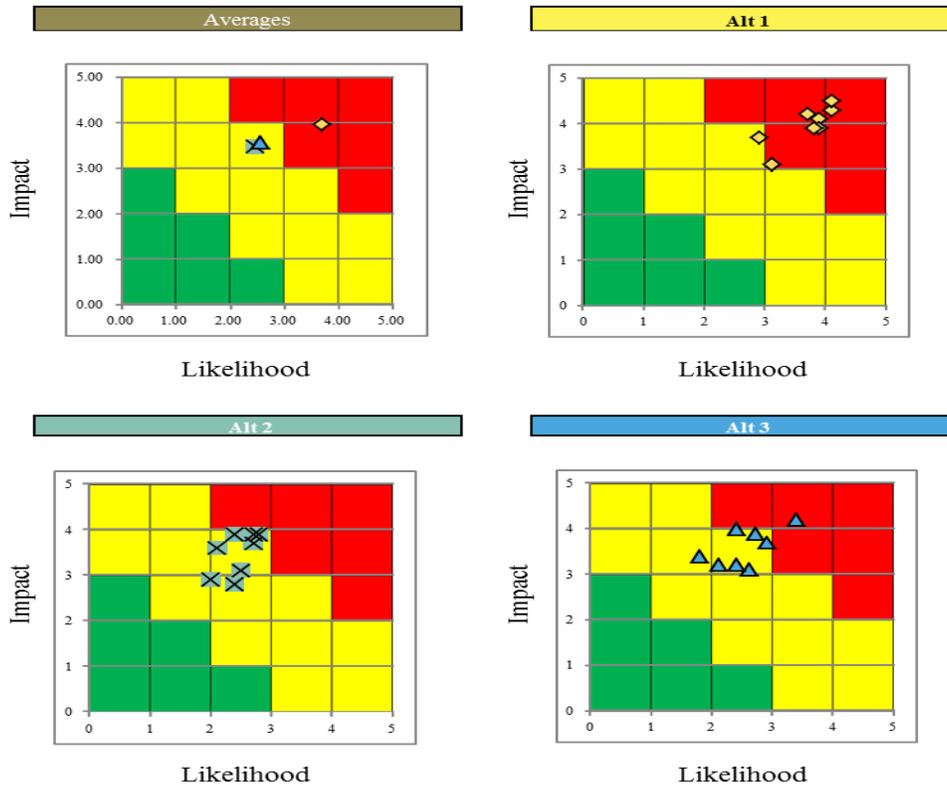


Figure 21: Risk Matrix

The Averages Matrix depicted in the upper-left quadrant of Figure 21 consolidates the results of the individual alternative assessments into a single point for each alternative. This depiction shows that Alternatives 2 and 3 were comparable in their relative risk impacts and likelihoods of occurrence. Alternatives 2 and 3 score over a point better than Alternative 1, and slightly better in terms of risk impact.

2.6.2.4.3. Comparing Risks across Alternatives

Once the PSM IPT has evaluated the likelihood and impact of risks inherent to the different alternatives, the risk analysis results should be incorporated with the results of the Cost and Benefits Analyses to support a decision among the product support alternatives. Relatively small or noncomplex analyses may be best summarized with a narrative description of the relative risk inherent in each alternative. For more complex product support analyses, a best practice is to incorporate the results of the Risk Matrix into the Utility score that includes the Cost and Benefits Analysis results.

Before the results of the risk assessment can be included in the Utility Score, a composite Risk Score must be calculated for each alternative.

The Risk Score is calculated by multiplying the average likelihood of risks within an alternative by the average impact. Figure 22 lists the Risk Scores computed for the GSS.

$$\text{Average Risk Score} = \text{Average Likelihood} * \text{Average Impact}$$

	Alternative 1	Alternative 2	Alternative 3
	As-Is (Transactional)	PBL LRU-level	PBL GSS-level
Average Risk Score	14.6	8.5	9.1
Risk Rank	3	1	2

Figure 22: Average Risk Scores

In the GSS example, Alternatives 2 and 3 demonstrate significantly less risk compared to Alternative 1. The Risk Scores are used in the next section to determine the Utility Score that the program can use as part of its decision to select a single product support alternative.

2.6.2.5. Sensitivity Analysis

As defined in the Product Support BCA Guidebook: “Sensitivity analysis is a repetition of an analysis with different quantitative values for cost or highly variable ground rules and assumptions to determine their effects for comparison with the results of the basic analysis.” Sensitivity analysis is a tool that should be used for assessing the extent to which costs and benefits are sensitive to changes in key factors or assumptions.

Two principal approaches may be utilized for the Sensitivity Analysis. First, for those factors where a very limited range of values is possible, or, where a limited number of possible assumptions are considered, each combination can be tested in a scenario analysis. Scenario analysis is used for testing the effect of the relative weights of cost, benefit, and risk, and of the benefits criteria. Second, where there are multiple combinations of assumptions, more sophisticated sensitivity analysis methods may be used.

PBL Leading Practice(s)
Use simulation (e.g., Monte Carlo) in order to determine the impact of changing assumptions or values on cost and benefits associated with each alternative.

2.6.2.6. Determining a Utility Score

Earlier in Step 6, the PSM IPT determined the relative importance or “weight” of the cost, benefit, and risk in their overall decision-making process.

Cost	Benefit	Risk
33.3%	50%	16.7%

Figure 23: Generic Subsystem Cost, Benefit, and Risk Weights

Once the analysis of cost, benefit, and risk is completed, the resulting cost, benefit, and risk values should be combined with their respective weights to create a final Utility Score. Once scores are normalized, each alternative’s normalized score should be multiplied by its weight to

create a final Utility Score for each alternative. In Table 25, the final normalized scores and rankings for GSS are shown.

$$\text{Weighted Utility Score (Alt X)} = (\text{Cost weight}) * (\text{Alt X Cost score}) + (\text{Benefit weight}) * (\text{Alt X Benefit score}) + (\text{Risk weight}) * (\text{Alt X Risk score})$$

	Alternative 1	Alternative 2	Alternative 3
Cost Score	61.6	99.1	100
Benefit Score	41.5	100	84.8
Risk Score	58.2	100	93.4
<i>Calculation</i>	$(33.3\% * 61.6) + (50\% * 41.5) + (16.7\% * 58.2)$	$(33.3\% * 99.1) + (50\% * 100) + (16.7\% * 100)$	$(33.3\% * 100) + (50\% * 84.8) + (16.7\% * 93.4)$
Utility	51.0	99.7	91.3
Final Rank	3	1	2

Table 25: Generic Subsystem Final Normalized Score and Ranking

2.6.3. Conclusion

After concluding Step 6, the PSM IPT will have identified and analyzed the estimated costs, benefits, risks, and sensitivities for each of the potential product support alternatives. The result of Step 6 should be a clear analysis of the advantages and disadvantages of the product support alternatives. In Step 7, the PSM IPT will use this analysis to choose a product support method. The analysis in Step 6 guides the alternative recommendation; but as stated earlier, the resulting recommendation is not the default decision. There may be other factors that influence the recommendation.

2.6.4. Concepts in Action: Generic Subsystem Use Case

The GSS team has completed the product support analysis of costs, benefits, risks and sensitivities. Of the three product support alternatives, Alternative 1 – the current sustainment strategy – was determined to be the least effective by each measure. Alternatives 2 and 3 were judged to be significant improvements from the baseline. While Alternative 3 was expected to have slightly lower costs, Alternative 2 – the LRU-level PBL – received the highest Utility Score due to Alternative 3’s expectations of higher risks and lower benefits. The results were insensitive to changes in the cost analysis or the weighting of the costs, benefits, and risks. In almost all cases in the Sensitivity Analysis, Alternative 2 provided the best value, and in no cases was Alternative 1 determined to provide best value. Table 26 provides a summary of the alternatives.

	Alternative 1	Alternative 2	Alternative 3
Short Description	Current as-is baseline transactional	LRU-level PBL, focused on LRU availability	GSS-level PBL, focused on GSS availability
Pros	Based upon the principal analysis, none	Anticipated increase in performance, and most importantly, the severing of the traditional relationship between cost and performance	Reduction in cost and anticipated increase in performance; relatively low associated risk
Cons	Poor performance results; high cost per unit of performance; complex management with lack of coordination	Cost relative to Alternative 3; required change in the way in which the Service performs sustainment	Relative complexity of implementation; degree of required cultural shift; required increase in the level of trust and cooperation between participants
Analysis Rankings	Cost 3 Benefit 3 Risk 3 Utility 3	Cost 2 Benefit 1 Risk 1 Utility 1	Cost 1 Benefit 2 Risk 2 Utility 2
Risks	Highest rated risk was the risk of subtier suppliers remaining unresponsive; risk of deterioration of the current state of performance is a further concern	Highest-rated risk was the risk of costs exceeding estimates; as an external observer, the GSS team is concerned that the anticipated improvements may not come swiftly enough to avoid disappointing stakeholders who wish to see change more immediately	Highest-rated risk was the risk of costs exceeding estimates; the immediate adoption of Alternative 3, and the cultural change required, may represent too much change too swiftly
Additional Findings/Observations	Current baseline is not meeting needs; no evidence that performance or costs will improve if the status quo approach is perpetuated	In addition to being the selection based upon the analysis, this appears to be a preferred option, and one that represents an excellent opportunity to increase PBL usage and understanding within the Service	One possible explanation for the resulting ranking is a transfer of risks seen as otherwise not captured to the benefits scoring

Table 26: Alternatives Summary for Generic Subsystem Use Case

2.7. Step 7. Determine Support Methods(s)

2.7.1. Introduction

Once the product support alternatives have been analyzed, the PSM IPT is prepared to recommend an option for PM approval. The selected product support alternative is then used to structure appropriate PBL arrangements. This step summarizes the PSM IPT actions required to facilitate the PM's selection of a product support alternative.

2.7.2. Process

2.7.2.1. Product Support Alternative Decision

Once the PSM IPT reaches this step, it has critically analyzed important product support factors. The team evaluated the product support requirements and structured its follow on efforts around achieving these requirements. The requirements were decomposed and allocated as appropriate (below the system level) to subsystem and/or components. Performance outcomes and cost objectives were quantified in metrics and threshold values were defined to support subsequent analysis. The relative merits of Government and commercial providers were assessed in the context of the required product support performance.

Insights for Success

In addition to the quantitative output from the Product Support Value Analysis carried out in Step 6, there are a number of political and organizational realities (such as budget cycle or competing priorities) that may impact the PSM's decision. The PSM must be pragmatic when presenting a support solution, considering all aspects of the program environment.

The team used this information to structure distinct product support alternatives. These alternatives were then analyzed at the appropriate level to support fact-based decisions, while considering limited program resources to conduct analysis. The analysis followed a structured methodology that ensured the alternatives could be contrasted based on relevant costs, benefits and risks. The result of the analysis (the Utility Score) now serves as the basis of the recommendation to the PM for pursuing a specific product support strategy. This Utility Score is a useful decision support tool, but is only part of the critical thinking that guided the PSM IPT through determining the recommended alternative.

Once an alternative is selected, the PSM IPT is positioned to expand the strategy through the LCSP and to formulate appropriate PBL arrangements. The team's critical thinking in its analysis of alternatives yielded information that will be used in structuring the appropriate PBL arrangements. This information includes:

- Work scope (product components and support elements) for the arrangement work statement
- Metrics for performance specification and incentives
- Selection of the appropriate contract type based on risk

The chosen product support alternative includes information on the timing and phasing of costs. The PSM should use this information to negotiate funding needs with the Service resource sponsor. The funding requirement should be justified using the results of the analysis, which

included an assessment of the sensitivity of the sustainment performance to the product support elements; this assessment provides the PSM with an explicit linkage between funding requirements and readiness. This information should be used to establish any appropriate funding transfers between the acquisition and materiel commands or to plan any transition in funding responsibility from the program to the Service materiel command. The PSM should capitalize on PSM IPT members from the Service resource sponsor and materiel command to negotiate funding amounts, timing and responsibilities; this process should occur early enough to ensure the program's funding requirements are included in the programming process. Funding agreements with the Service materiel command should be captured in the LCSP and validated through the concurrences provided in the Sustainment Command Representative signatures.

2.7.3. Conclusion

At the conclusion of Step 7, the analysis is complete and the PMO has selected a single alternative. The next steps are to designate the PSI(s) and PSP(s) based on the selected product support alternative.

2.7.4. Concepts in Action: Generic Subsystem Use Case

The GSS team has completed Step 7 and the PM chose to pursue an LRU-level PBL (Alternative 2). Alternatives 2 and 3 were both attractive alternatives when compared to Alternative 1, which was the "As Is," transactional arrangement. The trade-offs between Alternatives 2 and 3 indicate a very narrow difference between the two; Alternative 2 was modestly greater in Materiel Availability, Reliability, and Long-Term Manageability with lower expected risks. While Alternative 3 was expected to have slightly lower costs over the remaining useful life of the system, the GSS team concluded that Alternative 2 provided the best value to the Government.

Insights for Success

The socialization of your PBL alternative is an important facet of the process that should not be overlooked. A Communication Plan is an effective tool to ensure awareness and gain buy in at both the program and commodity level.

Key drivers of the anticipated improvement include:

- Transfer of responsibility and risk for availability of the LRUs from the Government to the PSP
- Leaner processes for repair initiation (administrative process reductions)
- Streamlined shipping/transportation network
- Increased use of partnership and improved demand signaling

In Table 27, the GSS team created a risk mitigation plan to address the risks identified in the implementation of the LRU-level PBL.

Generic Subsystem Risk Mitigation Plan			
ID	Risk Description	Strategy	Activity to Address
1	If the provider fails to effectively manage its supporting supply chains, then targeted performance may not be achieved.	Control	Establish contractual availability targets with incentives/disincentives to drive the desired behavior and hold the provider accountable.
2	If the GSS PMO is not provided LRU asset visibility, then the PMO may not be compliant with Service policies.	Control	Establish contractual data sharing requirements with incentives/disincentives to drive the desired behavior.
3	If costs exceed the expected costs for the arrangement, then affordability may be a challenge.	Control	Establish fixed-price contract vehicle, aligned to the PBL tenets, to set and manage expected costs from the outset.
4	If NEOF/Cannot Duplicate (CNDs)/No Fault Found (NFFs) testing is inconsistent and the root cause of failures is indeterminable, then this may add unnecessary inventory requirements.	Control	Establish contract language for sustaining engineering and FSRs with incentives/disincentives to drive the identification and reduction/elimination of NEOFs, CNDs, and NFFs.
5	If OPTEMPO changes are not accounted for in the PBL arrangement, then there may be materiel shortfalls/excesses, readiness impacts, and/or funding issues.	Avoid	Establish OPTEMPO adjustments in the contract. Manage through continuous communication with the provider regarding anticipated OPTEMPO changes.
6	If the sub-tier suppliers are unresponsive, thus lengthening lead times, then the longer RTAT may impact the ability to maintain readiness.	Transfer	Establish contractual availability targets with incentives/disincentives to drive the desired behavior and hold the provider accountable for the entire value chain's performance. Contractually require the provider to submit a sub-tier supplier management strategy.
7	If the Contractor is unable to hire skilled FSRs to operate in contingency locations, then readiness in these locations will be impacted.	Control	Contractually require the provider to provide uninterrupted support in contingency locations with incentives/disincentives to drive the desired behavior.
8	If supply and demand signals are not transmitted effectively through the end-to-end value chain, then demand forecasting and supply planning challenges will impact materiel availability.	Transfer	Establish contractual availability targets with incentives/disincentives to drive the desired behavior and hold the provider accountable. Further reduce risk by institutionalizing improved transparency and communication across the supply chain.

Table 27: Generic Subsystem Risk Mitigation Plan

2.8. Step 8. Designate Product Support Integrator(s) (PSI)

2.8.1. Introduction

Desired performance outcomes were identified in Step 4, followed by an analysis of options and a determination of a support method in steps 5-7. Now, the PM/PSM must decide if the objectives and complexity of the PSA require the level of management and oversight associated with a PSI.³² The PSI may be a Government organization or a commercial entity engaged via an arrangement. It should be noted that Advisory and Assistance Services (A&AS) contractors provide knowledge-based services and are not synonymous with a PSI on a PBL product support arrangement.³³

The PSI is responsible for integrating product support, as defined by the product support plan, and implementing in one or more PSA s. PSIs manage the execution of the product support solution delivered by the PSPs, developed by the PMO team, and used by the Warfighter to meet mission requirements.

2.8.2. Process

The PSI works closely with the PSM who oversees their performance. The integrator role requires the PSI to work closely with the PSPs (commercial or organic) providing support. Successful arrangements develop a communication and execution model to deliver the outcome. PSIs are responsible for the performance of one or more PSPs within a specific product support element or across product support elements. There may be a system-level PSI that manages subsystem-level PSIs. A PSI may also perform the function of a PSP. Thus, PSIs can assume many roles and can take various forms, but their function in the PBL arrangement is consistent. PSIs act as an integrator, an organizer, and an aggregator of information on behalf of the program, as they drive toward readiness targets at the platform level.

Typical candidates for the PSI role are:

- The system's OEM or prime contractor;
- An organic agency, product, or logistics command (e.g., DLA, NAVSUP WSS, depots);
- A third-party logistics integrator from the private sector; and
- The PM's own logistics organization

2.8.3. Conclusion

Not every PSA requires a PSI, but the role of aligning the interests of the Warfighter and the product support providers must be considered as the arrangement is developed. The selection of a PSI or the assignment of that role to a member of the program management team is integral to the overall success of the PSA. Descriptions of the roles and responsibilities across the PM, PSM, PSI, and PSP functions are discussed in the PSM Guidebook.

³² Not every PBL arrangement will require a PSI. The PSM may choose to implement arrangements directly with PSPs, especially if the arrangement is for support of a single component or subsystem and does not involve multiple PSPs.

³³ A&AS are defined in [Defense Federal Acquisition Regulation Supplement \(DFARS\) 237.201](#).

2.8.4. Concepts in Action: Generic Subsystem Use Case

The GSS team completed Step 8 and selected the OEM to serve as the PSI. The GSS PBL arrangement, which involves the management of a portfolio of components critical to the operation of GSS in the field, is sufficiently complex to warrant the assignment of a PSI. The GSS team determined the OEM was the best option to fill this role, including the capability to manage and integrate subtier suppliers, DLA, intermediate maintenance, and depot activities. The OEM reports directly to the PSM.

2.9. Step 9. Identify Product Support Provider(s) (PSP)

2.9.1. Introduction

The PSP is the entity doing the work, be it executing maintenance actions or managing the supply chain under the direction of the Product Support Integrator. The PSP could be a DoD activity, a commercial business, or in some cases a combination of both coordinated through a partnership agreement. Each IPS element may present the PSM IPT with candidates to accomplish the required product support. Within each IPS element, the work will further delineate into technical, hands-on, and management tasks. As the team develops and analyzes sustainment options, the optimum PSP options are identified.

2.9.2. Process

Identifying the appropriate PSP(s) will depend on a thorough analysis of Warfighter requirements and the product support alternative developed and selected in Steps 5-7. Typical candidates for the PSP role are:

- The original equipment manufacturer or OEM
- Commercial sector suppliers, vendors, subcontractors, support contractors
- A DoD provider (e.g., systems command, logistics command, organic depot)
- Commercial sector logistics, maintenance, repair, and overhaul (MRO), and transportation organizations

For fielded weapons systems, PSMs often develop their product support strategy via a Government – Industry teaming arrangement with the OEM. Engaging an OEM or industrial base partner early in the development of a PBL strategy is an identified best practice. If engaged early enough in the process, OEM PSPs can influence design for reliability, maintainability, and supportability and can leverage the production line for concurrent procurements, redesigns, and upgrades. The OEM is also in a position to affect obsolescence or DMSMS mitigation efforts by utilizing economic order quantity purchases with their suppliers across multiple product lines. The PSP can also provide expertise in improving the repair or maintenance process based on both product knowledge and experience.

PBL arrangements with the OEM are often pursued through sole source contracts, which require a J&A at leadership levels appropriate to the type and dollar value of the procurement. PSMs should ensure the J&A clearly articulates the unique capabilities of the OEM and why no other source is capable of providing the addition of new components or new users and resolving sustainment challenges through the most optimal combination of additional spares, training, redesign, support equipment, maintenance, planning, etc. J&As must fully document the decision to pursue a sole-source PBL arrangement clearly defining the requirement and the business case for awarding the contract to a specific vendor.

A PBL arrangement is also applicable for a product manufactured by multiple suppliers. If the product support plan allows for multiple sources of supply and/or services and the market supports it, a competitive bidding process should be pursued for the PBL arrangement. The process of clearly defining the requirement and aligning incentives with performance objectives applies in a competitive environment as well. It is also possible to develop an organic or

government only PBL arrangement. The framework of this type of PBL is the development of agreements between government entities which seek to align the interests of the sustainment provider and the customer. While lacking the foundation of a contract to guide the parties, this type of PBL can provide better performance through improved communication and a focus on both the requirement and the repair or sustainment process.

Considerations and processes for selecting the appropriate PSP candidate(s) include:

- Defining the scope of the proposed legacy or new start system chosen to be supported
- Creating and communicating a mutual understanding of the scope among *ALL* stakeholders (stakeholders are points of contact from multiple Government and commercial entities that will have an investment role in the candidate system(s))
- Documenting Warfighter and stakeholder requirements for the candidate
- Identifying items to be covered
- Understanding the PSP’s role in relation to the current support posture, implications for desired performance requirements, and metrics to be used for tracking performance
- Considering potential system obsolescence costs
- Considering diminishing manufacturing sources and material shortages
- Determining affordability, available funding, and direct impact on scope and cash flow
- Compliance with law (e.g., 10 USC 2464, 2466, etc.) regarding statutory compliance for allocation of workloads across the organic-industrial base
- Defining how configuration control will be maintained

Table 28 provides basic strategic considerations around managing configuration through ECPs.

Engineering Change Proposals	
Strategic Considerations	<p>The Service should continue to maintain configuration authority for modifications impacting the form fit and function of the equipment (i.e. Class I ECPs).</p> <p>PBL Providers will seek to obtain an expedited review and approval process for Class II ECPs not affecting form, fit and function. In these cases it is important for the service to:</p> <ul style="list-style-type: none"> • Confirm that they agree with the modification • Confirm that the change is in fact a Class II change and is not a Class I change impacting Form, Fit and Function.

Table 28: Engineering Change Proposal Considerations

2.9.3. Conclusion

The identification and selection of the PSPs is critical to the success of any PBL arrangement. A properly structured PBL arrangement will include a thorough definition of the PSP(s) role to include a detailed explanation PSP responsibilities. In addition, a clear framework for the PSP’s interaction with the PSI in accomplishing the specific tasks required in the arrangement is an

important element in setting up the arrangement. When the PBL arrangement with the PSI includes their supplier base (PSPs), it is important for the PM/PSM to consider how the integrator and provider team will engage second and third tier suppliers in the execution of the PBL. There are numerous examples in PBL programs where a failure to consider the supplier base has caused problems in executing the desired sustainment strategy. It is also important to consider the integration and team work required between the PSI/PSP and the government to execute a successful PBL.

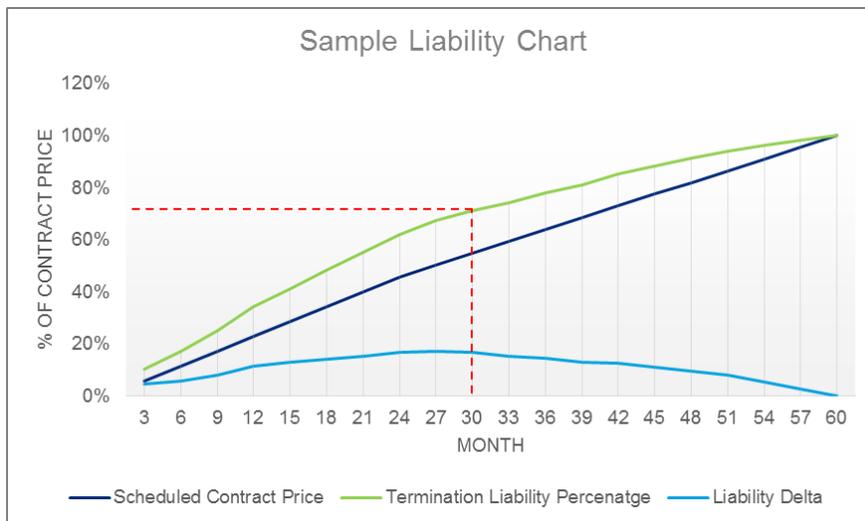
2.9.4. Concepts in Action: Generic Subsystem Use Case

The GSS team completed Step 9 and identified the OEM as the preferred product support provider (PSP). The team determined that the OEM is uniquely positioned to provide engineering and other process improvements necessary to directly impact product reliability and the technical expertise required to drive integration of the GSS into the weapon system. Additionally, the OEM has the capability to manage the logistics and engineering processes of both lower tier suppliers and to execute a partnership with the organic depot. It is within the OEM's scope to provide the level of the performance needed to meet Warfighter requirements, specifically improvements that will yield improved MTBF. A fixed price contract with metrics for CWT and LRU availability, allows the Government transfers risk to the OEM. The OEM accepts this transfer of operational and financial risk for the opportunity to earn greater profits by driving down the cost of these sustainment improvements. The result reduces the number of repairs meeting Warfighter requirements.

2.10. Step 10. Identify/Refine Financial Enablers

2.10.1. Introduction

Effective PBL arrangements require budget priority and sufficient resources to meet required outcomes. As such, implementing a stable funding strategy in an often unstable budget environment can be a major challenge when executing an effective PBL arrangement. The PM/PSM plays an important role in securing the required financial resources for weapon system sustainment within an uncertain budget process. Funding strategies for PBL arrangements (especially contracts with industry) should consider alternatives, mitigate customer and provider risks, and accommodate uncertainty and variability. In addition to the considerations above, contractual provisions within the PBL arrangement should provide the parties adequate adjustment flexibility to help accommodate such variability. The appropriate protections will help maintain enough structure within your arrangement to ensure the provider is incentivized to make appropriate investments in improvements, ultimately reducing program costs. One common approach that can be used is the inclusion of a Termination Liability table that will help regulate the liability of the program, specifically in situations of termination for convenience, while safeguarding business exposures taken on by the provider. Figure 24 below is a sample chart that compares termination liability against the scheduled contract price within the contract. For example, at month 30, in a termination for convenience scenario the government would be liable for 71% of the total contract price.



Month			
3	6	9	12
10%	17%	25%	34%
15	18	21	24
41%	48%	55%	62%
27	30	33	36
67%	71%	74%	78%
39	42	45	48
81%	85%	88%	91%
51	54	57	20
94%	96%	98%	100%

Figure 24. Sample Liability Chart

2.10.2. Process

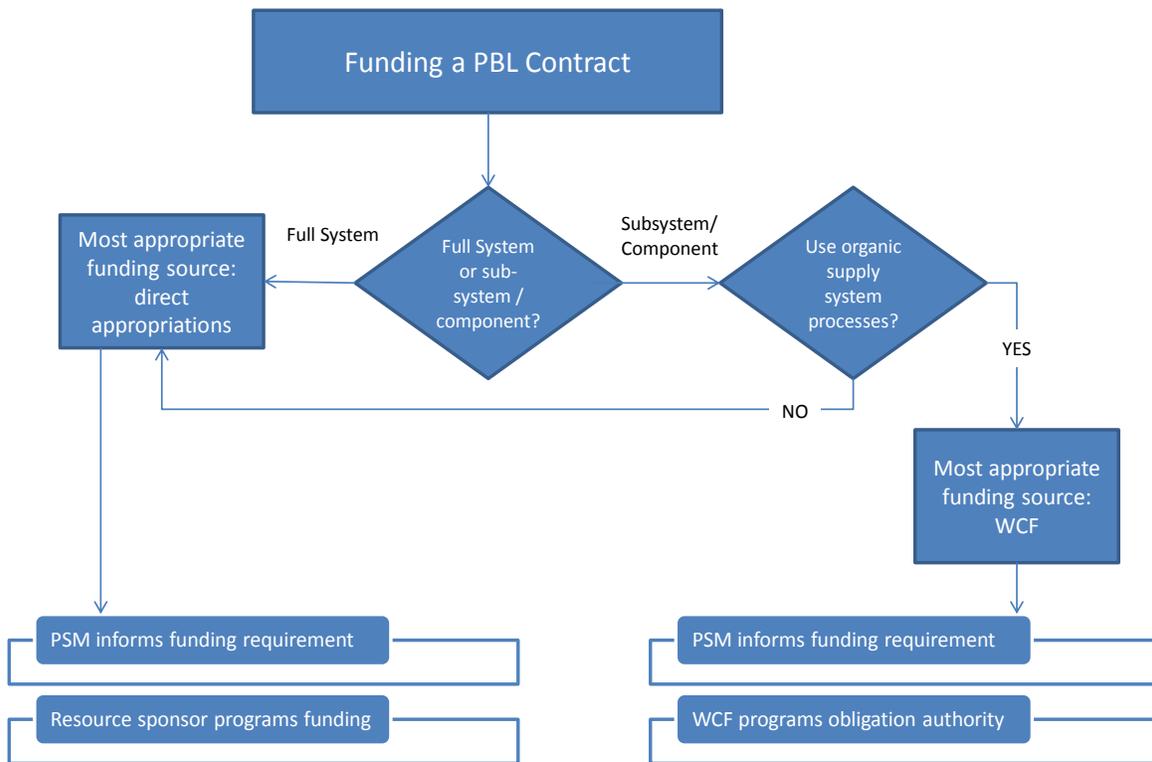


Figure 25. Alternatives to Fund a PBL Contract

Within DoD, Services may use either Working Capital Funds (WCFs) or direct appropriations to contract for PBL arrangements. Figure 25 depicts a decision flow chart to help PSMs as they pursue the most appropriate funding source.

When determining the most appropriate mechanism to fund your sustainment arrangement, it is important to refer to guidance provided both by the DoD and by the respective Services.

WCFs are appropriate funding sources for PBL-related supply, depot maintenance, and transportation activities. WCFs may further enable the award of long-term contracts, since they are revolving funds for the military services. WCF-funded PBLs are transparent to the Warfighter interacting through supply and financial systems. It should be noted that customers reimburse WCFs with appropriated dollars for these types of arrangements. Specific guidance and information pertaining to WCF regulations can be found within DoD 7000.14-R Volume 11b (http://comptroller.defense.gov/Portals/45/documents/fmr/Volume_11b.pdf).

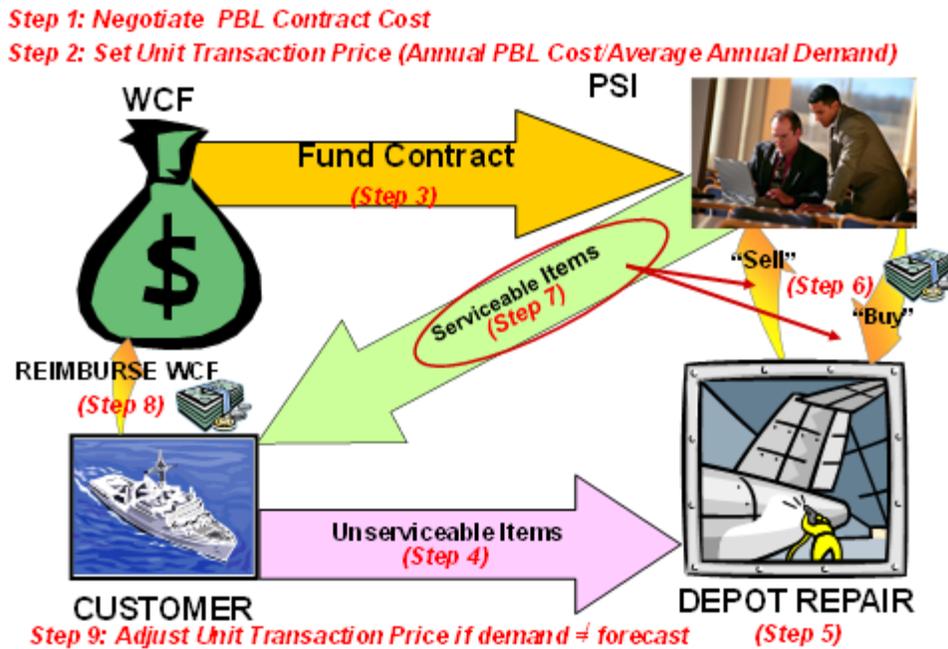


Figure 26. Steps to Fund a PBL Contract Using WCFs

Figure 26 lists the steps to fund a PBL contract using a WCF. These steps include:

1. Negotiate the PBL contract cost
2. Establish prices for items within the PBL contract.
3. Fund the PBL contract.
4. Customer sends unserviceable item to the repair depot via supply chain and submits a requisition for a serviceable item (using standard supply chain procedures). The depot can be at the PBL contractor's location (noncore workload) or at an organic depot when they are acting as a subcontractor³⁴ to the PBL contractor (core workload).
5. Depot completes the repair and places a serviceable item back into stock.
6. Depot sells serviceable item to the PSI, who pays the depot.
7. PSI fills the requisition and issues serviceable item.
8. Customer reimburses the WCF.

Benefits when using WCFs to fund PBL arrangements include:

- Long-term contracts – WCFs do not expire and therefore support long-term contracting. These may reduce Service overhead costs and motivate the provider to make long-term arrangements with suppliers.
- Flexibility – Requirements-type and Indefinite Delivery, Indefinite Quantity (IDIQ) contracts can provide performance-based incentives through incremental orders. Doing so aligns resource requirements with variable system use in the execution year. For example,

³⁴ This assumes a PPP for depot maintenance where the organic depot serves as a PSP, performing the touch labor in support of an industry PSI as part of a direct sales agreement under the auspices of 10 USC 2563.

using flying hours and demand bands to adjust pricing on WCF-funded PBLs are methods to increase flexibility.

- **Cost visibility** – WCF-funded PBL contracts should provide the Service with actual cost reporting to the National Stock Number (NSN), which enables the Service to accurately establish NSN prices that balance expected revenues and sales and support future contract renegotiation.

Direct appropriations may be the most appropriate funding source for PBL contracts that operate completely outside the existing Service supply chain and the normal requirements generation process or cover a full system beyond supply, maintenance, and transportation activities. The type of appropriation depends upon the phase of the life cycle (typically procurement and Research, Development, Test, and Evaluation (RDT&E) during development, and O&M during sustainment). PBL contracts funded with direct appropriations limit flexibility for awarding long-term contracts due to the obligation limits associated with various appropriated funds. However, the use of option years is a method to retain flexibility. Direct appropriations may also fund multiyear (MY) PBL contracts. These contracts must comply with the congressional notification or approval process outlined in 10 U.S. Code § 2306b(h) for MY contracts. The Air Force has successfully used appropriated funds for system-level PBL arrangements. Table 29 highlights a few of the best practices to consider when funding a PBL arrangement with appropriated funds.

Best practices when using direct appropriations to fund PBL arrangements:
<p>Performance bands – A common complaint of full-system PBL contracts is that they are “must pay” large annual bills that are not flexible to changes in system use during the execution year. To retain Service flexibility, consider contracting for performance bands (for example, separately pre-priced ranges of flying hours).</p>
<p>Cost visibility – The Service should have cost visibility at a detailed level to monitor performance as the PBL arrangement is executed. The O&S cost-estimating community also requires cost visibility in order to better estimate the costs of future systems. PBL contracts should utilize the cost-reporting contract clauses and forms available at http://dcarc.cape.osd.mil/CSDR/Default.aspx.</p>
<p>Enterprise-level considerations – Since direct appropriation-funded PBL arrangements may be executed outside the existing supply chain, the PSM must ensure that the Service appropriation, WCF financial managers, and logistics managers assess the impact of funding decisions. If the replaced systems operate within the WCF, a loss of parts demand associated with the PBL arrangement may increase internal transfer prices on other systems still within the WCF.</p>

Table 29: Direct Appropriations Best Practices

Direct appropriation contract funding may require the PSM to comply with Service-specific policy on PBL funding coordination between the acquisition and the materiel commands. For example, the acquisition command might program for the first year of sustainment, and the

materiel command might fund the out years of the Future Years Defense Program (FYDP). When transitioning funding responsibility from the acquisition to materiel command, the PSM must communicate funding needs with sufficient lead time to influence the programming process.

When determining the appropriate financial mechanism to fund your PBL arrangement, it is also important to consider the timing associated with securing the necessary financial resources. Paralleling the variability of the budget environment is a complexity that can make allocating funds time consuming and challenging. In this regard, it is beneficial to begin the process of determining your funding strategy and securing the necessary financial resources early within this process, to avoid any delays in implementing the PBL arrangement. The process map in Figure 27 is an example of a simple tool that can be used to demonstrate where the funding process fits into the implementation process of your product support alternative.

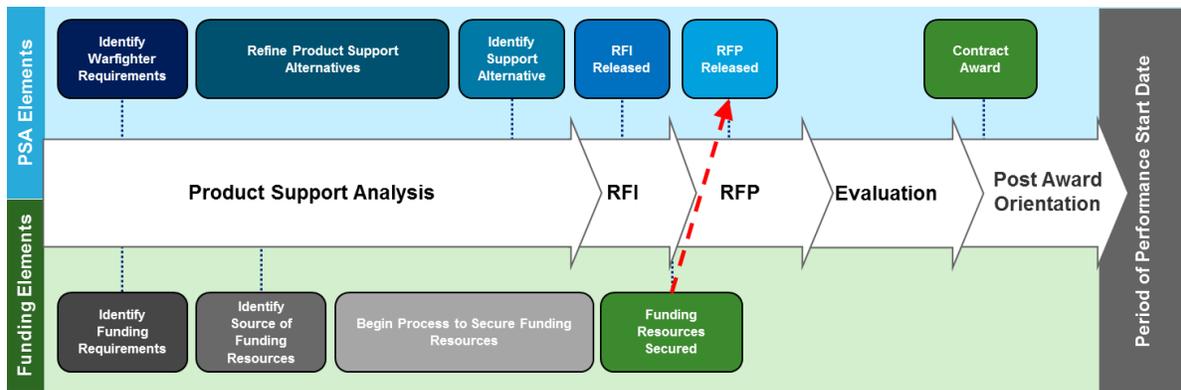


Figure 27. Funding Considerations for PBL Award

2.10.3. Conclusion

If the PBL arrangement will use the existing Service supply chain for subsystems or components, then WCFs are the appropriate source of contract funding (customers reimburse the WCF with appropriated funds that must be sufficient to support the contract). If the PBL arrangement will use support operating outside of existing Service supply chain, or it entails a system-level PBL arrangement beyond supply, maintenance, and transportation activities, then the direct appropriation is the appropriate contract funding source. The PSM informs funding decisions in concert with the PM, appropriate Service financial managers, and logistics managers.

Table 30 summarizes the attributes of appropriated and revolving WCF funds.

<i>Attributes</i>	Appropriations	Working Capital Funds
Type	<ul style="list-style-type: none"> • Operations & Maintenance (O&M) • Procurement • Research, Development, Test, and Evaluation (RDT&E) • Military Construction (MILCON) 	<ul style="list-style-type: none"> • Revolving funds for military service
Uses	<ul style="list-style-type: none"> • All logistics support elements 	<ul style="list-style-type: none"> • Supply support • Depot-level maintenance • Packaging, handling, storage, and transportation (PHS&T)
Restrictions	<ul style="list-style-type: none"> • O&M – one-year funds • Procurement – three-year funds • RDT&E – two-year funds • MILCON – five-year funds 	<ul style="list-style-type: none"> • Only be used to fund activities associated with supply, depot maintenance, and transportation
Product Support Strategy Impact	<ul style="list-style-type: none"> • Funds expire • Cannot guarantee availability of funds beyond appropriation time limits • Multiyear agreements achieved through series of five-year contracts subject to availability of funds 	<ul style="list-style-type: none"> • Funds do not expire • Can be used to award multiyear contracts • Require appropriated funds from other resource sponsors to fund additional logistics support elements

Table 30. Funding Source Comparison

2.10.4. Concepts in Action: Generic Subsystem Use Case

With GSS, the Government pursued the use of a subsystem PBL, leveraging the use of the existing supply system and the transparency it offers to the operator. Since the GSS PBL arrangement is being executed by a WCF-funded activity, the Government can pursue a long-term contract as an added incentive to drive the OEM to pursue process improvements that drive down cost to deliver and improve margin.

2.11. Step 11. Establish/Refine Product Support Arrangements

2.11.1. Introduction

This step demonstrates how to construct a PBL arrangement, using the analysis and planning conducted in the prior steps. The objective of the arrangement is to deliver Warfighter requirements and to incentivize product support providers to reduce costs through innovation. Attributes of effective PBL arrangements include:

- Objective, measurable work description that acquires a product support outcome
- Appropriate contract length, terms, and pricing strategies that encourage delivery of the required outcome
- A manageable number of metrics linked to desired Warfighter outcomes and cost reduction goals
- Incentives to achieve required outcomes and cost reduction initiatives
- Risks and rewards shared between Government and commercial product support integrators and providers

2.11.2. Process

PBL arrangements may take a variety of forms, including contracts, MOUs, MOAs, and PSAs. PBL contracts can be structured to procure services or supply and can be funded with O&M appropriations, WCFs, or other “colors of money” as appropriate. Historically the majority of PBL contracts are FFP or FPIF, but other fixed-price contract variants may be appropriate. However, data indicates cost-type contracts with performance incentives may be appropriate depending on the risk, period of performance, and availability of cost data. The PoP for PBL contracts is usually longer than transactional contracts (typically a three to five-year base period with additional option periods) to allow PSPs to make long-term investments that improve system availability and reliability and realize a financial return.

Insights for Success
When developing contractual language for the PBL arrangement, keep stakeholders from the COA development phase included to ensure the supporting contractual framework embodies the intent of the chosen COA.

2.11.2.1. Contract Framework

Figure 28 shows that PBL contracts use the traditional contract structure. The text underneath each section title provides a brief description of the content within that contract section. Particularly important sections include Sections B, C, H, and I. Section B contains a brief description of the supplies and services and quantity. Section C contains a detailed description of the requirements and may contain references to the statement of work and other sections of the contract. Section H contains a clear statement of any contract requirements that are not included in Section I, contract clauses, or in any other sections of the contract. Section I contains clauses required by the Federal Acquisition Regulation and appropriate Defense supplements.

Contract Format					
A contract is usually organized in the Uniform Contract Format. It is formatted into parts I, II, III, and IV.					
Part I:					
Section A	Section B	Section C	Section D	Section E	Section F
Contract form. Contains basic information such as the issuing office, address and contact number.	Supplies or Services and prices/costs. Contains brief description of the supplies or services and quantity.	Description specifications/ statement of work. Contains brief description of the supplies or services and quantity.	Packaging and marking. Provides packaging, packing, preservation, and marking requirements	Inspection and acceptance. Contains inspection, acceptance, quality assurance, and reliability requirements	Deliveries or performance. Specifies the time, place, and method of delivery or performance
Part II, III, and IV:					
Section G	Section H	Part II	Part III	Part IV	
Contract Administration data Contains any required accounting, appropriation data, required contract administration information or other instructions.	Special contract requirements Contains a clear statement of any special contract requirements not included in sections I, II, or III.	Contract Clauses Section I: Includes standard clauses of considerable power defining rights and responsibilities of contracting parties	List of Documents, Exhibits, and Other Attachments Section J: List of attachments, documents and exhibits in this section. (examples: Illustrations and certifications)	Representations and Instructions Section K: Representations, certifications Section L: Instructions conditions and notices Section M: Evaluation factors for award	

Figure 28. Uniform Contract Structure

There are best practices that should be considered when constructing a PBL arrangement, specifically in Sections C and H. Section C focuses on developing performance requirements, incentives, demand variation, program management, and invoicing (except within the Navy, as invoicing is done in Section G). Section H focuses on the special contract requirements, including those unique to PBL arrangements. PBL-specific considerations within Section H include inventory custody, Financial Improvement and Audit Readiness (FIAR), use of Government-owned inventory (including DLA assets), and use of FSRs. To assist PMs in translating the guidance in this section into an actual PBL arrangement, Appendix I of this document provides sample language for a PBL contract using the Generic Subsystem example. Executing an arrangement will require the involvement of the legal, contracting, and sustainment communities. This process will benefit greatly from the involvement of all key stakeholders and the PSM’s creation and maintenance of a contract execution timeline. For more information on contract structure reference the Defense Acquisition University’s contract structure site <https://acc.dau.mil/CommunityBrowser.aspx?id=38087>.

2.11.2.2. Section C (Description Specifications/Statement of Work)

Performance Requirements

As the PSM IPT develops requirements and contract metrics in Step 4 (Identify/Refine Performance Outcomes), it must ensure that metrics are measurable and the Contractor’s actions are directly linked to Warfighter requirements. Metrics chosen for inclusion in the contract

should incentivize contractor behavior toward meeting system goals. In Section C, these considerations are documented.

As discussed in Step 4, metrics should be appropriate for the level chosen, scope of support needed and level of control delegated by the Government. For example, a widely used metric to measure supply support performance is CWT, a time-definite delivery metric designed to deliver appropriate levels of material availability to the Warfighter. CWT uses the Uniform Material Movement and Issue Priority System (UMMIPS). The desired performance outcome for the PBL arrangement should be linked to the top-level sustainment requirements of the system. Table 31 illustrates how priorities are tied to the CWT metric, and these priorities can be adjusted based on the Warfighter requirements.

Issue Group	Urgency of Need Designator	Delivery Time Frame to Government Shipper
1	A	2 days
2	B	3 days
3	C	10 days

Table 31: Priorities Tied to CWT Metric

As determined in Step 5, GSS requires availability, reliability, and manageability in its PBL arrangement. The metrics included in the arrangement should align with the PSP activities. For the GSS, CWT and MTBF metrics were chosen as the subsystem needed faster response times for LRUs with maintained reliability. These metrics, their targets, and their calculations are included in the contract artifact in Appendix I.

Incurred cost reporting is another valuable tool for contract management. Evaluation of actual costs will also provide the negotiator a firm baseline for determining price reasonableness and will allow the Government the opportunity to reap the benefits of cost reductions driven by the Contractor’s innovation and improvements. For example, in NAVSUP WSS, leadership requires that actual incurred cost data from the current or previous PBL be utilized during follow-on negotiations to ensure the best value is negotiated. Incurred costs should be collected during execution and provided as part of the follow-on proposal.

Incentives

Robust PBL arrangements contain performance incentives and disincentives linked to the sustainment requirements of the Warfighter. Incentives and disincentives should be included in the PBL contract to achieve the target level of performance. For the GSS, the Contractor shall ensure the CWT requirement is met at least 85% of the time. In the event that the Contractor

PBL Leading Practice(s)
 As the Proof Point analysis indicated, incentives included in the contractual arrangement drive the behavior, actions, and investment decisions of the PSP.

fails to meet any delivery time frame requirement, the Government reserves all rights and remedies under the contract (see Appendix I). The other metric in the GSS’s arrangement is MTBF. The target is 900 hours, which is the current level of MTBF for the subsystem. The OEM will be required to maintain or improve this level of reliability. The percentages in the incentive/disincentive columns illustrate what the contract could potentially gain or lose by either exceeding or not meeting those targets. If the Contractor only meets the target, then no incentives/disincentives will be incorporated. In Tables 32 and 33, the incentives and disincentives for the GSS are listed.

	CWT	Incentive	CWT	Disincentive
	95%	+5%	80%	-3%
	90%	+3%	75%	-5%
Target →	85%	---	70%	-7%

Table 32: CWT Incentives and Disincentives

	MTBF	Incentive	MTBF	Disincentive
	1500 hrs	5%	800 hrs	-3%
	1200 hrs	3%	700 hrs	-5%
Target →	900 hrs	---	600 hrs	-7%

Table 33: MTBF Incentives and Disincentives

PBL contracts can include additional incentives that impact provider behavior. Award term incentives (48 CFR 1516.401-70) where the provider becomes eligible for additional periods of performance under the current contract by achieving prescribed performance measures, are a good way to incentivize and motivate the provider. PBL contracts may also include a reduction in price at contract option exercise, which allows the Government to save money while receiving the same performance and further pushes the PSP to improve its supply chain operations and/or product reliability.

Another reason a price may be less at option exercise is because the cost per unit of performance went down during the initial arrangement due to the provider improving their processes or products to increase profit. Cost data are provided at option exercise and establishes a new cost basis. Inherently, fixed price-type contracts incentivize providers to find ways to reduce cost and increase their profit margin.

Table 34 provides a detailed description of industry’s perspective of arrangements. Understanding industry’s perspective will help the PM/PSMs capitalize on the incentives that drive the industry.

Industry Perspective of Arrangements
<p>Appropriate period of performance</p> <ul style="list-style-type: none"> • Enables long-term pricing agreements to lower cost. This helps provide predictability in steadily growing or steady revenue. • Provides confidence in long-term cash flow to enable investments. • Allows time to implement continuous process improvement, i.e., make the processes more efficient (reduce manpower, inventory, etc.). • Time to overcome negative trends in reliability investments.
<p>The opportunity to earn and sustain profit</p> <ul style="list-style-type: none"> • Within reasonable limits (e.g., fixed-price contract with a cost share)
<p>Direct sales depot partnerships</p> <ul style="list-style-type: none"> • If contractors pay for repairs, then they are incentivized to reduce the number and/or cost of repairs
<p>Access to the end customer (Warfighter)</p> <ul style="list-style-type: none"> • Providing field service representatives at the operational or repair level enables contractors to see firsthand how the equipment is being used and allows for more responsive customer service

Table 34: Industry Perspective

How PMs can benefit from understanding industry’s perspective:

- **Appropriate period of performance:** An arrangement term consistent with the level of required investment offers industry the ability to invest in the system to achieve future savings and offer a better price to the Government. It offers the organic provider a business case to invest in infrastructure and workforce improvements. Opportunities that provide long-term revenue streams and consistent workloads are attractive to both commercial and organic sustainment organizations, even though the benefits differ. This does not mean that if a multiple-year base is not possible that PBL arrangements are not executable. There are examples of successful PBL arrangements with a one-year base and one-year options. However, this PoP will limit the PSI or PSPs ability to invest in improvements.
- **The opportunity to earn and sustain profit:** Both organic and commercial providers are driven to optimize the long-term health of the organization. In the case of the commercial provider, it is by earning and sustaining long-term revenue and profits, while the organic provider is often motivated to retain workload, to capitalize on the use of existing Government infrastructure and to utilize and build upon resident expertise.
- **Direct sales depot partnerships:** PMs may encourage these types of partnerships; they have been proven to result in Service maintenance depots achieving efficiency and product quality

levels. The Service depot wins through the realization of enhanced maintenance capabilities, and the commercial firm wins with improved profitability.

- **Proximity to the end customer:** By having frequent unfiltered access to customer information, equipment issues are more readily identified. This may significantly decrease the lead time for maintenance and repairs and also reduce the number of NEOFs.

In addition to the metrics, the PMO may require the Contractor to report on supplementary data. In Table 35, suggestions of the additional reporting requirements are shown. These reporting requirements may be adjusted per the Warfighter requirements.

Level	Reporting Requirements
System	<ul style="list-style-type: none"> • Retrograde Return Metric • Cost per Operational Hour
Subsystem	<ul style="list-style-type: none"> • Average Fill Rate • Average Contractor Requisition Response time • Outstanding Requisitions • Average Casualty Report Time • Back Order Age
Component	<ul style="list-style-type: none"> • Carcass Tracking (ensuring accountability and return of repairables) • Demand Forecasting • Inventory/Asset visibility

Table 35: Reporting Requirements

Using Demand/Operational Hours Variation Coverage to Determine Pricing

One option for determining pricing is creating a demand band around a forecasted number of operational hours plus/minus a percentage (for example, +/- 10% to forecasted flight hours). If the forecast is 100,000 hours per month, monthly contract payments are not adjusted unless actual operational hours exceed 110,000 hours or go below 90,000 hours. This approach assumes a correlation between operational hours and demand. Less contract administration is required, as all payment terms remain the same unless negotiated operational hour bands are impacted.

This same mechanism works using an estimated number of yearly demands. In the example below on the right, utilizing demand hours protects the Government by mitigating the risk of an inaccurate demand forecast. A program may forecast demand at 500 units per year, with a +/- 10% aligned with their forecasted demand. Negotiated monthly contract payments are not adjusted if the actual demands are between 550 and 450. Table 36 below compares the industry practices for using operational hour bands versus demand bands. This decision will be unique to each program at different times based on access to historical data, risks, and operational tempo.

Operational Hour Bands	Demand Bands
<ul style="list-style-type: none"> • Determined using correlation between operational hours and demand generation: for x number of operational hours, y amount of demand will be generated • Used when there is a strong correlation between operational hours and demand generation (on a yearly basis) • Bands are created around forecasted operational hours 	<ul style="list-style-type: none"> • Determined using historical demand data for the system and forecasting those trends for future demand • Used when demand is not indicative of operational hours • Bands are created around demand determined by the program

Table 36: Operational Hour and Demand Bands

Program Management Reviews

Quarterly or semiannual Program Management Reviews are a best practice when executing a PBL arrangement. These reviews allow stakeholders, both industry and organic, to assess the performance or take corrective action to address performance or cost variance. During reviews, the PSM IPT should consider the following topics:

- a) Arrangement performance trends
- b) Quality of product (e.g., reliability)
- c) Quality of repair process
- d) Retrograde return
- e) Open action items
- f) Configuration management
- g) Subcontracts management

Invoicing

After the contract is awarded, PBL contractors are generally paid using lot pricing. Under this payment approach, PBL contractors are paid in monthly increments (1/12th of annual dollar value) each month of the overall period of performance (in accordance with the annual negotiated FFP value of the contract).

2.11.2.3. Section H (Special Contract Requirements)

A properly structured PBL arrangement may include the following special provisions in Section H of the contract³⁵. See Appendix I for the specific contract language for GSS.

Inventory Custody

Often in a PBL arrangement, the Contractor assumes custody of the Government property (inventory and equipment); however, the Government still owns the inventory. This property is called Government Furnished Property (GFP). In accordance with the Federal Acquisition

³⁵ IUID, corrosion control, and other special considerations may be included. Section H will include all applicable special requirements per DoD instructions, FAR, DFARS, and other references.

Regulations (FAR), the Contractor shall have a system of internal controls to manage (control, use, preserve, protect, repair, and maintain) Government property in its possession. The property must also be recorded in a Government Accountable Property System of Record. Interim DoDI 5000.02 states that a PM will develop and implement a product support strategy that addresses “the government accountable property system, [which] documents all government-owned property, whether it is held and managed by the government, contractor, or third party, in accordance with 40 U.S.C. 524.”

Financial Improvement and Audit Readiness

In accordance with DoDI 5000.64, PBL contracts must be compliant with FIAR, including the ability to properly perform inventory valuation. Contractor custody of inventory can complicate the inventory processes, so FIAR compliance plans should be addressed in a special clause in the contract.

Use of DoD inventory

A decision to use organic versus commercial sources should be part of developing an acquisition strategy and supported by a management analysis. FAR Part 51 authorizes contractors to use Government sources for supply and DoDI 4140.01 requires the use of existing Government-owned inventory to be maximized before seeking new commercial support on all PBL Arrangements and Collaborating Agreements.

When DoD inventory meets the appropriate government quality and technical requirements, then the PBL contractor shall maximize the use of the Government inventory in collaboration with the Government owner (including the Services and the DLA). The Government owner and/or manager of the inventory shall adjust their demand projections if the future sourcing will be channeled to commercial sources. The contractor shall continue to check Government inventory levels in collaboration with the government owner at periodic intervals (at least annually) to ensure:

1. Government inventory usage is maximized, and
2. The Government is not holding inventory above acquisition requirements while buying from commercial sources through a PBL

After maximizing the use of existing Government inventory, the Contractor has the latitude to continue to use DoD inventory as a permissive and authorized source of supply. This approach provides for maximum, cost-efficient use of existing DoD inventory and allows for proper future demand planning for those inventories.³⁶

Field Service Representatives (FSR)

When appropriate, FSRs may be part of the PBL arrangement. The FSR’s range of support includes, but is not limited, to design interface, technical assistance, spare maintenance, vehicle

³⁶ DoDI 5000.64, DoDI 4161.02, and Draft DoDM 4140.01 state all government-owned property must be recorded in a Government Accountable Property System of Record. DoDI 4140.01 requires the use of existing government-owned inventory shall be maximized before seeking new commercial support on all Performance-Based Logistics Arrangements and Collaborating Agreements.

maintenance, onsite repairs, and onsite testing for NEOFs. By having an FSR on site, there is a higher probability of diagnosing the root cause of the problem, reducing the need to send the entire system to the depot and decreasing the lead time for issue resolution.

2.11.3. Conclusion

At the end of Step 11, the PBL arrangement should be complete. The specific roles, responsibilities, relationships, and incentives of the arrangement need to be formalized within this arrangement. It should reflect the recommended outputs from the analyses determining the proper PBL alternative. The PBL arrangement also contains the price and performance requirements used in source selection and the metrics chosen to measure achievement of outcomes. The specifics of the arrangement should be agreeable to all stakeholders and should align with the PSM's sustainment strategy for the program.

2.11.4. Concepts in Action: Generic Subsystem Use Case

The metrics for the GSS PBL are defined above and are built into a request for proposal (RFP) released by the GSS PO. The PSM consulted with PMOs that developed similar PBLs when drafting the RFP, and used the resources available on the PBL Community of Practice Web site at <https://acc.dau.mil/pbl>. The RFP is for a five-year contract, which will allow the OEM to make investments in the system over a guaranteed period of performance. The RFP was released sole-source to the OEM after a J&A was signed. The contract example for GSS can be found in Appendix I.

Step 11: Developmental System Considerations

For developmental systems, it is critical to establish detailed measurement and evaluation criteria for each sustainment metric (including any key dependent enabling technologies) to validate/verify performance. Additionally, it is important to provide information about risk and risk mitigation, as related to sustainment, as program development and testing continue.

2.12. Step 12. Implement and Assess

2.12.1. Introduction

Tracking performance is a critical part of PBL arrangement management, so PBLs cannot be a “fire and forget” endeavor. A Quality Assurance Surveillance Plan (QASP)³⁷, routine reviews and performance monitoring, and close collaboration between stakeholders aid in driving successful PBL outcomes. Proactive corrective measures, based on changing Warfighter requirements or system design changes, may need to be undertaken to meet performance targets. Executing a PBL arrangement is an iterative process that requires PM/PSMs to monitor performance and assess the ever-changing environment in order to achieve optimal results.

PBL Leading Practice(s)

Sharing lessons learned across the Services and within the PM, PSM, BFM, contracting, and sustaining engineering communities increases the cadre of PBL professionals in the DoD.

2.12.2. Process

2.12.2.1. Quality Assurance Surveillance Plan

It is important to assess performance with a QASP, which must be mutually agreed upon and often includes sampling or audit requirements. The support provider is responsible for ensuring the quality of all work performed, and the Government is responsible for surveillance and monitoring. A typical QASP addresses:

- What gets measured, when, and by whom
- Processes to identify and address quality issues
- Quality assurance (QA) monitor(s)

QA is a continuous activity designed to determine if the work being performed meets or exceeds the quality performance standards. The goal is to prevent substandard work, rather than correct for it later. The rigor of the QA process should match the needs of the program; it should be a major element in program management and control, focusing on insight rather than oversight. The QA monitor(s) should be independent of the work being measured.

The program should ensure that it has the resources to monitor the reporting management process because simply reporting on these measurements will not ensure the quality standards are maintained.

2.12.2.2. Independent Logistics Assessments (ILA)

An ILA provides the PM/PSM with an objective assessment of the program’s product support planning. The ILAs, which include PBL checks, strengthen program support and cost-effectively enhance supportability and sustainability. This assessment should be performed according to OSD and Service policy.

³⁷ A QASP for PBL service contracts or a similar plan for PBL supply contracts.

The assessment provides the PMO insight for structuring and executing a successful logistics support program, specifically their PBL arrangement and sustainment strategy.

2.12.2.3. Routine Reviews and Reporting

PBL programs should establish formal periodic reviews with stakeholders, including the PO, key “customer” representatives, representatives from the contracting community and the PSI/PSP(s). Best practice organizations develop performance and cost reports regularly to help them proactively manage their programs. These teams should have internal, formal performance metrics reviews monthly and should execute working-level reviews as necessary to exercise adequate oversight of critical operational metrics. Should teams encounter “off-track” performance, weekly progress reports and meetings are recommended to drive the team back toward arrangement targets.

Insights for Success
When managing a PBL arrangement, the emphasis shifts from managing specific parts to managing the PSI/PSP and the service they are performing. Establishing effective communication with both internal and external stakeholders is a key element to successfully managing the provider and PBL arrangement.

2.12.3. Conclusion

Given the iterative process of executing a successful PBL arrangement, it is important to exercise consistent reporting, communicate regularly with key stakeholders and assess the performance of the arrangement at routine, designated times. Figure 29 below summarizes best practices related to managing PBL contracts.



Figure 29. Best Practices for Managing PBL Contracts Post-Award

2.12.4. Concepts in Action: Generic Subsystem Use Case

The GSS PMO signed the contract, and the period of performance has started. The PSM is tracking the two performance metrics, CWT and MTBF, on a monthly basis to ensure that the OEM is meeting its contract requirements and to identify any potential problems quickly. The PSM is tracking inventory levels, procurement lead time, and administrative lead time to understand root cause impacts to CWT. However, only the two performance metrics are built into the contract. The PMO has scheduled quarterly program reviews with the OEM to review contract performance and discuss any issues that arise.

The PSM recognizes that tracking contractor performance will also help the Government capture savings at contract renegotiation, as the PMO will have a complete picture of performance under the PBL arrangement.

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3.1. Resource A: Frequently Asked Questions (FAQ)

Performance-Based Logistics

Question: What is the definition of performance-based logistics (PBL)?

Answer: PBL is an outcome based support strategy that delivers an integrated, affordable product support solution that satisfies Warfighter requirements while reducing Operating and Support (O&S) costs. When dealing with industry, product support outcomes are acquired through performance based arrangements that deliver Warfighter requirements and incentivize product support providers to reduce costs through innovation.

Question: What is the PBL Guidebook, and where can I find it?

Answer: The PBL Guidebook is a reference manual and “how-to-guide” for PBL, which can be found on the Defense Acquisition University (DAU) website at <https://acc.dau.mil/pbl>.

Question: What attributes indicate equipment might be good candidates for a PBL arrangement?

Answer: Every system, sub-system and component that requires maintenance, repair or overhaul subsequent to entry into the inventory should be evaluated to determine whether or not PBL support might be appropriate. Many, but not all systems, sub-systems and components are good PBL candidates. Attributes indicating a PBL might be appropriate:

- a. Annual sustainment spend for a single equipment in excess of \$4M
- b. Annual sustainment spend for a family of equipment (e.g Radars, FLIRS) in excess of \$4M
- c. Equipment performance not meeting warfighter requirements
- d. Equipment has reached a level of maturity that potential sustainment providers can reasonably approximate failures

Attributes indicating equipment might not be good candidate for a PBL arrangement

- a. Highly complex or new technology equipment entering the inventory where failure rates are completely unpredictable
- b. Equipment exiting the inventory within 2-3 years after of deploying a PBL contract

Question: If I am not a program logistician or within the program management organization, why should I be involved in the PBL process?

Answer: Implementing a PBL arrangement requires a cross-functional team with a broad range of knowledge, including contracting, legal, finance, logistics, program management, etc.

Without a cross-functional group of individuals, the arrangement may be improperly structured, delayed, or ultimately un-executable. (2.2.1 Form the Product Support Management IPT)

Question: What is the purpose of the PBL PSM IPT Charter?

Answer: The purpose of the PBL Charter is to identify the desired outcome, the stakeholders for the PBL initiative and define the participant's roles and responsibilities.

Question: Why are large volumes of raw data required for the BCA?

Answer: In order to ensure a holistic and unbiased view of the current sustainment strategy's challenges, opportunities and spend, it is critical to provide a wide range of data in a format that can be analyzed effectively.

Question: At what point is it appropriate to engage the OEM in the PBL initiative?

Answer: The appropriate time to engage the OEM within a PBL initiative varies. When trying to evaluate the correct time to involve an OEM, it is important to consider the various inputs that may be required from the provider and at what stage such inputs will need to be available for review. Additionally, depending on the acquisition environment (competitive vs. sole source), there will be certain limitations to the scope/context of allowable discussions in which the parties are expected to operate. For example, when trying to evaluate a course of action in which the OEM will license certain maintenance data to a third party, it will be necessary to solicit feedback from the OEM as early as possible to determine if this data is available or needs to be licensed. Regardless, establishing a collaborative communication flow with all involved parties is important to the successful implementation of any strategy.

Business Case Analysis

Question: What is a product support BCA?

Answer: Business case analysis (BCA) is a process for assessing various product support alternatives benefits, costs, and risks. The BCA should document how each alternative fulfills warfighter requirements, the cost to deliver, and potential risks. The results of the BCA support the PM's decision to pursue a specific product support solution and provide the data (work scope, performance objectives, metrics, roles, and responsibilities) that support development of PBL arrangements, where appropriate. The term BCA is not intended to mandate a specific level of analysis.

Question: Why are BCAs important?

Answer: A BCA is important to assist the PM/PSM in developing and analyzing cost-effective product support strategies. Per 10 U.S.C. § 2337, *Life-Cycle Management and Product Support*, the PSM must conduct appropriate cost analyses to validate the product support strategy, including cost-benefit analyses as outlined in Office of Management and Budget Circular A-94,

and revalidate any business-case analysis performed in support of the product support strategy prior to each change in the product support strategy or every five years, whichever occurs first.

Question: How much time do product support BCAs generally take to prepare/complete?

Answer: A relatively straightforward analysis for a low value component may be done in a few days to a few weeks. A subsystem BCA may take six months or more, and the most complex platform-level BCAs could take 18 months or more. The time required to perform a BCA is determined by the complexity of the alternatives being evaluated. This analysis provides information required by the PM and PSM to evaluate the support alternatives and select one. The analysis should not require greater effort or cost than warranted by the decision being made. It should give a clear comparison of each alternative in terms of cost, benefits, and risk to aid the PM in selecting the alternative that meets Warfighter requirements at lowest O&S cost.

Question: Who is responsible for the development of the BCA?

Answer: The PSM is responsible and accountable for the product support BCAs, however, sustainment commands may conduct BCAs for a commodity it manages or a service it provides. Anyone who needs a disciplined process for informed decision making should include BCAs in their toolkit.

Question: Where can I find additional information about product support BCAs?

Answer: Extensive references and training are available, including:

- DoD Product Support Business Case Analysis (BCA) Guidebook
- DoD Product Support Manager (PSM) Guidebook
- Product Support Analytical Tools Database
- CLL 015: Product Support Business Case Analysis Continuous Learning Module
- CLL 040: Business Case Analysis Tools Continuous Learning Module
- BCF 207: Economic Analysis
- Business Case Analysis (BCA) ACQuipedia Article

Question: How does a PM/PSM determine the cost savings (or avoidance) associated with a PBL arrangement?

Answer: Through the BCA, the PM/PSM documents the costs associated with the scope of effort and the period of performance identified in the SOO/PWS for a proposed PBL arrangement. These estimated costs are compared to the current product support solution costs for the same operational outcome to make a fair and reasonable determination of anticipated costs for the sustainment options.

Ultimately, the contract cost to government determines cost savings or avoidance.

Cost should be evaluated at the contract level. Alternatives should not be evaluated with surcharge penalties that resulted from reduced demands. Undefined Contract Actions (UCAs)

should not be used in evaluating savings of a PBL arrangement since contract terms, specifications, or price are not agreed upon before performance is begun under the action.

Contracting Strategies & Incentives

Question: What constitutes a properly structured and executed PBL arrangement?

Answer: Successful PBL arrangements have the following attributes:

- Objective, measurable work description that achieves a product support outcome
- Appropriate contract length, terms, and funding strategies that encourage delivery of the required outcome
- A manageable number of metrics linked to desired Warfighter outcomes and cost reduction goals (usually three to five)
- Incentives to achieve required outcomes and cost reduction initiatives
- Risks and rewards shared between Government and commercial product support integrators and providers
- Active management by the PSM with frequent, transparent interaction between the PSM, PSI, and PSP

Question: What are best practices for managing PBL arrangements?

Answer: Tracking performance is a critical part of PBL arrangement management. Thus, PBL arrangements cannot be a “fire and forget” endeavor. A QASP, routine reviews and performance monitoring, and close collaboration between stakeholders will aid in driving successful PBL arrangement outcomes. The PM/PSM must have a relationship built on trust with their industry counterpart(s) and maintain open and honest lines of communication. ([2.12.3 PBL Management Best Practices](#))

Question: What practices and procedures could negatively impact successful PBL implementation?

Answer: PBL arrangements are negatively impacted by:

- Too many metrics, “informational” metrics that are not part of PSI or PSP responsibility but consume their resources to track, and metrics that work counter to one another
- Micromanaging PSIs and PSPs to the point that it impacts their ability to perform (e.g., disapproving needed PSI/PSP travel because Government travel is restricted)
- Excessive staffing and approval process (e.g., multiple layers of staffing, peer reviews and approval that are not applied to non-PBL arrangements)
- Treating PBL arrangements as “fire and forget” arrangements that do not require active management by the PSM
- Applying Cost Recovery Rates

Question: What is the optimal contract type for a PBL effort?

Answer: Fixed-price contract variants are the preferred type because they provide the greatest incentive to the PSI and PSP to improve their products and processes and reduce their cost to

perform. When the providers cost to deliver or the risk is difficult to determine, then a FPIF target contract with a ceiling price and a profit-sharing formula is appropriate. However, successful PBL arrangements have been implemented with CPIF contracts and may be the more appropriate arrangement when the risk cannot be reasonably quantified or the cost of transferring risk to the PSI or PSP is more than the Government will accept. The key to an effective PBL arrangement is using incentives to elicit the desired behavior/outcome from the PSI/PSP in spite of the guaranteed cost reimbursement.

Question: What is the appropriate PBL contract length?

Answer: The PBL arrangement must be long enough for the provider to recover any investments made to improve their product and/or streamline their processes to meet the Government’s requirements.

- Complex subsystem OEMs (e.g., engine OEMs) want five- to seven-year contracts. This PoP gives them time to identify issues impacting reliability or improve processes, design the fix, field the improved subsystem or implement the improved processes, and recover the investment.
- Less complex subsystems and components or arrangements that require less investment to improve may have shorter arrangements.

However, no OEM will make investments that cannot be recovered during the PoP. One or two year contracts do not incentivize the PSP to invest in performance improvements that drive down costs.

Question: What is the difference between multiyear and multiple-year contracts?

Answer: The primary characteristics of each contract type are included below.

*Multiyear*³⁸:

- Buys more than one year’s requirement without having to exercise options
- Beyond one-year investments can be recovered if contract is terminated

Multiple Years:

- Contract written for multiple years
- Only first year is ‘guaranteed’
- No recovery of investments if contract is terminated

Question: How are organic PBL PSPs incentivized to perform?

Answer: The PSP organization is motivated by improving its capability and capacity and ensuring a stable (or increasing) workload. The workforce is motivated to perform and insulate their facility from potential BRAC closures. Establishing PPPs with commercial industry and aligning the organic PSP metrics with those of the program has resulted in improved processes

³⁸ For more information on multiyear contracts, see FAR Subpart 17.1 – Multiyear Contracting.

and additional capabilities in organic facilities. These improved processes and capabilities result in additional workload in organic facilities. The organic PSP then continues to improve its productivity to satisfy program metrics and receive more work. There are different challenges and constraints when incentivizing public PSPs, compared to their commercial counterparts. Regulations preclude commercial PSIs from giving bonuses for exceptional performance to the Government PSPs they may have under contract. Any bonuses or awards given to the members of the organic PSP must come from the Command's authorized (and often limited) funds.

Question: What are appropriate PBL incentives?

Answer: Best practice PBL programs use incentives that promote behaviors and outcomes that benefit both the customer and supplier. The incentives should take into account the scope of the agreement, the complexity of the system, and the context of use. There is no universally applicable contract and incentive template. However, a PBL agreement can leverage various types of incentives, including:

- Incentive fees
- Award terms

Question: What should I consider when selecting performance incentives?

Answer: Considerations for selecting performance incentives include:

- Ensuring incentives are built upon performance objectives/standards and are realistic, measurable, and attainable
- Aligning incentives with the effort and contract value
- Structuring incentives for largest overall impact and avoiding any unintended consequences, while providing value for achieving mission
- Being careful what you ask for, as you will likely get it (and may not be able to afford it – or may not have really needed or wanted it)

Question: What should I do with the savings from PBL arrangements?

Answer: USD Acquisition, Technology, and Logistics (AT&L) stated in the Should Cost Management in Defense Acquisition Memo dated August 6, 2013, that “components have the latitude to apply savings to their most pressing unfunded requirements or may reinvest this funding within the same programs to accelerate the acquisition, fund cost-reduction initiatives, or cover critical unfunded requirements.”

Funding Strategies

Question: I keep hearing about “colors of money.” What does this term mean?

Answer: “Colors of money” refers to the different types of funding appropriations. A summary of the primary categories with their overall scope and statutory time limits is included below.

- **Research, Development, Test, and Evaluation (RDT&E)** – Covers RDT&E activities and expenses. Policy allows *incremental funding*, and the funds are available for *two years*.
- **Procurement** – For procurement of end items greater than or equal to \$250,000 per unit, all centrally managed items, initial spares and labor for certain production-related functions (e.g., item assembly, quality assurance). Policy requires *full funding*, and the funds are available for *three years*.
- **Operations and Maintenance (O&M)** – For replenishment spares, fuel, civilian salaries, construction projects less than \$750,000, travel, non-centrally managed end items less than \$100,000 per unit cost. Policy requires *annual funding*, and the funds are available for *one year*.
- **Military Personnel (MILPER)** – For Military Personnel expenses. Policy requires *annual funding*, and the funds are available for *one year*.
- **Military Construction (MILCON)** – Covers construction projects greater than or equal to \$750,000. Policy requires *full funding*, and the funds are available for *five years*.

Another type of fund is the **Working Capital Fund (WCF)**, which is a **non-expiring, revolving fund** that allows for contracts with multiple-year performance periods. Congressional multiyear contract authority is not required for these contracts, greatly simplifying contract execution. Funding is applied to long-term contracts in annual increments, reducing the amount of funding that must be obligated at any given time.

A thorough overview of the types of appropriations can be found in the DAU ACQuipedia article entitled *Types of Funds*.

Question: How does using appropriated versus revolving funds affect PBL contracts?

Answer: Services fund PBL contracts with either Working Capital Funds (WCFs) or direct appropriations. WCFs are appropriate funding sources for PBL-related supply, depot maintenance, and transportation activities. WCF-funded PBLs arrangements may also enable the award of long-term contracts and leverage existing supply chain procedures. As such, WCF-funded PBLs are transparent to customers interacting through supply and financial systems.

Direct appropriations may be the most appropriate funding source for PBL arrangements that operate outside the existing Service supply chain and the normal requirements generation process or cover a full system beyond supply, maintenance, and transportation activities. The type of appropriation depends upon the phase of the life cycle (typically procurement and RDT&E during development and O&M during sustainment).

Metrics

Question: What are the key considerations of performance measurement?

Answer: It is essential to translate performance outcomes specified by Warfighter into performance metrics in the arrangement. These metrics must be appropriate for the delegated level of responsibility and outcome assigned to the PSI or PSP (with measurable unit and time

frame). The differences between the top-level performance outcome and the metric included in the arrangement are included below.

- **Performance Outcome:** Requirement (typically stated by customer)
- **Performance Measure:** Typically a mathematical equation (e.g., “miles per gallon” and “cost per mile”)
- **Performance Metric:** Measure with unit and conditions (e.g., “average # miles in city traffic”)

Question: What constitutes a good performance metric?

Answer: Good performance metrics should be:

- Key to achieving and improving performance
- Linked to system-level objective
- Appropriate to scope and responsibility
- Reflective of processes that contractor has control of
- Specific to a unit of measure
- Specific to an acceptable range or threshold
- Able to motivate desired long-term behavior
- Understood and accepted
- Easy to collect data and verify
- Readily assessed
- Able to provide timely feedback

Question: What are good examples of potential measurement units for performance metrics?

Answer: Each program must decide the appropriate metric for their specific system requirements. However, generally programs will include one or more of the following:

- **Time:** Delivery time, schedule adherence, Cost Per Flight Hour
- **Accuracy Rates:** Most often stated in percentages
- **Error Rates:** Number of mistakes/errors allowed in meeting performance standard
- **Milestones:** Percentage complete by target date
- **Cost:** Hourly, annual, life cycle

Question: Can I also use performance thresholds?

Answer: Thresholds must be established in all cases. Sometimes thresholds and objectives may be used with incentives to deliver the higher performance level:

- Measurement **during a period**
 - Time (delivery within 36 hours in CONUS)
 - Number (minimum of six RFI assets from the depot each month)
 - Percentage (5% not mission capable supply)
- Improvement **over multiple periods**
 - Product (improve quality by 3% each quarter)

- Process (increase efficiency 10% during 12 months)
- Cost (reduce support cost from previous fiscal year)

Question: Aren't there required DoD product support metrics?

Answer: Yes. JROC requires the mandatory Key Performance Parameter (KPP) of Sustainment be addressed for all Acquisition Category (ACAT) I and select ACAT II programs. The Sustainment KPP has three elements that provide an integrated structure that balances sustainment with capability and affordability across a system's life cycle. The first element is an Availability KPP, consisting of two components: A_M and A_O . The other two elements are Key System Attributes of Reliability and O&S Cost. Additional information on metrics may be found in Para 3.3 Metrics section of the DoD PSM Guidebook, the Life Cycle Sustainment Outcome Metrics ACQuipedia article, and CLL 001 Life Cycle Management & Sustainment Metrics continuous learning module for additional information.

Question: Can these top-level life cycle sustainment outcome metrics be put on contract or should we use tailored lower-tier metrics?

Answer: Top-level sustainment outcome metrics and/or lower-tier metrics can be put on contract. One of the most critical elements of a PBL strategy is the **tailoring of metrics** to the operational role of the system and ensuring **synchronization of the metrics** with the scope of responsibility of the support provider. The platform level and specifics of the arrangement will dictate whether to use top-level outcome metrics, lower-tier metrics or both.

Question: How is the right number of key performance metrics tied to incentives/disincentives? What (if any) are the detrimental effects of having too many KPI's?

Answer: Typically, three to five metrics is the effective number of metrics. The inclusion of "too many metrics" typically indicates that the arrangement is focusing on activities and not outcomes, thus limiting the flexibility of the PSI or PSP to apply resources where needed to be successful. Additionally, a large number of metrics can potentially dilute the impact of incentives, since metrics may offset each other.

Product Support Arrangements

Question: What is a product support arrangement (PSA)?

Answer: The term "product support arrangement" is defined in 10 U.S.C. § 2337, *Life-Cycle Management and Product Support*. This section defines "product support" and "product support arrangement" as:

- **Product support** — the package of support functions required to field and maintain the readiness and operational capability of major weapon systems, subsystems, and components, including all functions related to weapon system readiness.
- **Product support arrangement** — a contract, order, or any type of other contractual arrangement, or any type of agreement or non-contractual arrangement within the federal

Government, for the performance of sustainment or logistics support required for major weapon systems, subsystems, or components. The term includes arrangements for any of the following:

- Performance-based logistics
- Sustainment support
- Contractor logistics support
- Life cycle product support
- Weapon systems product support

Question: What is the purpose of a PSA?

Answer: PSAs enable a product support strategy. They must document the following:

- An acceptable range of weapon system performance objectives
- Corresponding support necessary to meet that level of performance
- Terms and conditions for payment, remediation, and other contract conditions

Product Support Integrators (PSI)

Question: What’s the best way for me as a PSM to manage my PSIs and PSPs?

Answer: Establish a collaborative business arrangement with trust between you and your PSI and/or PSP. Best practices for instilling trust in the business arrangement are close communication between the PSM and the industry counterpart and resolving issues at a working level where possible. While contract requirements should be clear, relying on legal and contract language to resolve every issue your program may encounter may undermine the business relationship. The Government PMO and the PSI/PSP share the same requirements and the best way to achieve these requirements is maintaining a business environment of collaboration, transparency, and trust. Note that communication, collaboration, transparency, and trust should be mutual, limited only by legal and FAR/DFARS requirements.

Question: What is the legal basis for a PSI?

Answer: 10 U.S.C. § 2337, *Life-Cycle Management And Product Support*, states a PSI is “an entity within the Federal government or outside the Federal government charged with integrating all sources of product support, both private and public, defined within the scope of a product support arrangement.”

Question: Where does a PSI fit within the various roles and responsibilities of the Product Support hierarchy?

Answer: The PSM may delegate specific portions of sustainment responsibility to one or more PSIs, who, as defined by law, integrate the support services of a range of PSPs to achieve the specified Warfighter required outcomes.

Question: Can the PSM and the PSI be the same person (or come from the same organization)?

Answer: Yes. There is no requirement for the PSM to assign a PSI as part of the product support solution. Depending on the complexity of the program and activities being managed, a PSM may retain all responsibility for product support success within their organization or delegate various product support responsibilities to one or more PSIs. (2.8 Designate Product Support Integrator)

Question: Can there be more than one PSI?

Answer: Yes. There is no limit to the number of PSIs that can be designated by the PSM, but PSIs are generally assigned a specific scope of responsibility that aligns either with subsystems or components on the weapon system or for specific IPS elements (see guidance and descriptions in the DoD Integrated Product Support (IPS) Element Guidebook). There can be a single PSI for the entire weapon system, or two (for example) for an aircraft airframe and propulsion system), or as mentioned, multiple PSIs for various subsystems or components of the weapon system. Each PSI has responsibility for accomplishing designated performance outcomes for their assigned scope of sustainment responsibility.

Question: What exactly does the term “Integration” mean in the PSI role?

Answer: “Integration” refers to coordinating the 12 product support element activities to deliver an effective and cost-efficient product support solution to the Warfighter. The 12 product support elements are:

- Product Support Management
- Design Interface
- Sustaining Engineering
- Supply Support
- Maintenance Planning and Management
- Packaging, Handling, Storage, and Transportation (PHS&T)
- Technical Data
- Support Equipment
- Training and Training Support
- Manpower and Personnel
- Facilities and Infrastructure
- Computer Resources

Effective support and sustainment of any weapon system, subsystem, or component over its life cycle always involves several, and often all, of these support elements. Each of these can be performed by separate organizations or by either (or both) the public and private sector, and in geographically disparate locations. Each of these functions is dependent, to some degree, on the other functions.

Question: Does it make any difference whether the PSI is a DoD entity or an industry entity?

Answer: Yes. Although statute allows for the PSI to be “*an entity within the Federal government or outside the Federal government,*” there may be times when it is advantageous to use a Government or commercial PSI. For example, the PSM may want to use the OEM as the PSI if OEM engineering expertise and experience with the system is important. Conversely, the PSM may use a Government PSI if the arrangement includes responsibilities inherently conducted by the Government.

Question: How can an industry PSI manage the performance of the work being performed by DoD workers, or vice versa, in accomplishing the “integration” of product support?

Answer: Many product support functions are accomplished by a combination of public and private sector workers, not only working separate functions, but also working together on common functions. The collaboration of public and private sector workers is usually done under a PPP, enabled by DoD statute in Title 10, Section 2474.

For example, if an industry OEM is designated as a PSI with responsibility for delivering outcomes dependent on organic performance of depot maintenance, then the industry provider has the ability to enter into a PPP with the depot(s) in which the details of the roles and responsibilities to facilitate achievement of the necessary outcomes through their mutual efforts is documented. This collaboration can apply under an Organic PSI as well.

Question: It seems that most PSIs are from industry and most of them seem to be the OEM. Does assignment of a PSI signify outsourcing of sustainment to industry?

Answer: No. However programs choose to allocate work among Government and commercial providers, the PSM is ultimately accountable for the performance of the PSAs.

Product Support Managers (PSM)

Question: What policies and guidance address the roles & responsibilities of the DoD PSM?

Answer: 10 U.S.C. § 2337, *Life-Cycle Management and Product Support*, states that the Secretary of Defense shall require that each major weapon system be supported by a PSM for a major weapon system.

Other documents that address PSM role and responsibilities include:

- DoD Directive 5000.01: The Defense Acquisition System
- DoD Instruction 5000.02: Operation of the Defense Acquisition System
- DoD Instruction 5000.66: Operation of the Defense Acquisition, Technology, and Logistics Workforce Education, Training, and Career Development Program
- Service-specific instructions

Question: What are the PSIs (and PSPs) responsible for?

Answer: The PSI and PSP are responsible for successfully executing all delegated activities associated with delivering the outcome specified in the PBL arrangement.

Product Support Providers (PSP)

Question: Is the role of PSP limited to private sector companies?

Answer: No. Similar to PSI, organic activities, such as an Army Depot, an Air Logistics Complex or an Inventory Control Point (ICP) can also serve as a PSP.

Question: What is the best way to incentivize a PSP?

Answer: Much in the same way as incentivizing a PSI, it depends on whether or not the PSP is an organic or commercial activity. If the PSP is an organic activity, the primary incentive is to increase the volume and predictability of the PBL workload. For the commercial PSP, there are a variety of effective incentives that can be used to manage repair behavior. See the FAQ section on contract types and incentives.

Question: If operational requirements change, can I reduce the required level of performance I'm paying for from the PSP (e.g., a "readiness rheostat")?

Answer: Yes. This is always a requirement that needs to be considered when constructing a PBL arrangement. A properly structured PBL arrangement should have provisions that cover such circumstances by allowing the program manager to legally adjust the performance or terminate a contract under certain conditions. For example, if payment is tied to unit of use, such as operating hour or miles driven, then a change in the level of operations will automatically result in a change in payment.

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3.2. Resource B: Myths

1. **PBL arrangements fail to deliver advertised mission readiness and cost improvements.**

Compelling evidence has been generated by multiple studies to demonstrate cost and performance improvements through PBL arrangements. In many cases the savings were understated due to accounting only for savings directly related to the arrangement and not accounting for savings associated with positive secondary effects on the logistics infrastructure as well. ([1.3.3 An analysis of PBL effectiveness](#))

2. **PBL arrangements must be developed and managed with precision to achieve significant cost and performance improvements.**

Positive outcomes are not strictly linked to perfect execution of a PBL arrangement, but rather to the fact that even moderate adherence to PBL business model tenets can result in success. Success is dependent upon the Services gaining an understanding of both the PBL business strategy and what incentivizes Industry.

3. **PBL and outsourcing are synonymous, negatively impacting Services' ability to comply with Core and 50/50 mandates.**

PBL's are structured as government only, government-industry partnerships and industry only arrangements. Defense Department financing and employee compensation practices make government only arrangements extremely challenging to develop and execute. On the other hand, PBLs that involve government-industry partnerships have proven to be very successful. Partnerships where industry serves as the Product Support Integrator and some or all of the sustainment work is sub-contracted to a government depot via a Direct Sales Agreement creates government depot and workforce incentives that result in better warfighter outcomes, greater government maintenance depot workload and reduced Service budgets. Bottom line: PBLs may involve outsourcing. However, it most often does not and the government has complete control over how PBLs are structured – not industry.

Moving to a PBL strategy provides the government leverage not available in transactional logistics arrangements to move work currently being done in commercial facilities into government depots. In a typical transactional sustainment arrangement where industry is performing the work in its commercial facilities, industry has no incentive to move work into government depots – in fact, it is dis-incentivized to do so in negotiated margin contracts where any reduction in industry costs results in reduced revenue and reduced profit.

Conversely, PBLs highly incentivize industry to take aggressive action to reduce its invested capital and perform sustainment work at the lowest cost facilities. Return on Invested Capital (ROIC) is a key motivator for industry since ROIC is one of the metrics

for which Wall Street and the money markets reward commercial companies. Industry reduces invested capital by, among other actions, moving work from its facilities to government facilities. Industry is and has been very consistent in its desire to move work to government depots when a long term, Firm Fixed Price PBL arrangement is being proposed by the government. Bottom line: Not only do PBLs NOT negatively impact CORE and 50/50 mandates, they provide the government leverage, not otherwise available, to bring work into their depots to overcome CORE and 50/50 challenges.

4. Ensuring the “best possible deal” should be Services’ criteria for executing a PBL arrangement.

Trying to achieve the “best possible deal” through a PBL arrangement can be costly and time consuming. Criteria for the execution of a PBL arrangement should be ensuring a “better deal” or “good deal” when compared to their current sustainment strategy. Delays in implementing better deals in search of the “best possible deal” has an opportunity cost that becomes more and more difficult to recover over time. Equally important, delaying forestalls the process of collecting data essential to knowing whether you are getting a “great deal” or just a “good deal” and how to improve the next one.

5. Industry makes “excess profits” on PBL arrangements, which hurts the Services.

Industry’s ability to potentially increase profit margins is linked to its flexibility to make process and product improvements over the course of the arrangement. This potential is provided in exchange for the Services receiving improved readiness at a reduced cost while the provider assumes performance risk. The Services’ primary concern is to pay less for more when compared to their current sustainment strategy, irrespective of industry profits. PBL contracts should be priced lower than the current contractual arrangements, constructed in a manner to collect the necessary data elements, enabling the follow on contracts to be negotiated at a lower rate.

6. PBL arrangements increase Service mission and financial risk.

While a single PBL arrangement may be contractually more complex to implement than a single transactional contract, the exchange of contractual complexity is offset by a PBL’s ability to reduce performance and financial uncertainty throughout the contract term. Additionally, a single PBL arrangement is less complex than managing dozens or hundreds of individual purchase requests and purchase orders and tracking their impact on readiness. In this regard, the financial and mission risks are less when supported via a properly structured PBL arrangement.

7. PBLs negatively impact “year-of-execution” funding flexibility

PBL arrangements are often cited as being “must pay bills” that limit flexibility to reallocate funds in the execution year. The truth is that all contracts are “must pay bills” regardless of them being a PBL arrangement or not. This becomes an issue only when there are insufficient funds to do all that is required within a given year. However, if a PBL arrangement can lower the cost of execution while improving performance that frees up money to be spent elsewhere. PBL arrangements can be structured to only pay for

what is used (e.g. flight hours). The “flexibility” in the year of execution is really provided by deferring the cost of today’s operations to future budgets. This flexibility comes at a premium, being the difference in cost between a PBL arrangement for operations and the cost of traditional, transactional purchase orders.

8. Where only one commercial provider exists, PBL cannot deliver mission readiness and cost improvements.

If the proper contract (arrangement) structure with appropriate incentives is used, mission readiness and cost improvements are provided in exchange for assured long term revenue streams and/or improved profitability. This motivates the provider to improve product quality and processes, regardless of the number of commercial maintenance providers. In some cases, PBL arrangements may be the strongest form of leverage available to the Services to reduce cost and improve performance where only one commercial maintenance provider exists.

9. Where Services do not own maintenance-related data rights, PBL arrangements cannot deliver mission performance and cost improvements.

PBL arrangements can still provide improved mission performance and reduce cost when the Services do not have data right ownership. In addition to the incentives mentioned in myth #8, commercial providers often provide the technical data to the government at no charge as part of the Public-Private Partnership (PPP) between the commercial provider and organic facility that supports the PBL arrangement. They do this because it is to both their and the government’s advantage to take advantage of the skilled government workforce and facilities that are provided in a PPP without requiring capital investment by the commercial provider.

10. PBLs result in a loss of Service “control”.

PMs / PSMs may delegate responsibility to the PSI or PSP as part of a PBL arrangement. However, the extent and scope to which the Services transfer control to a provider is a decision made by the Services and the ultimate responsibility and accountability always resides with the PM.

11. PBL strategy dictates a one-size-fits-all approach.

The commonality within PBL product support strategies stems from an approach where outcomes are acquired through arrangements that deliver Warfighter requirements, while incentivizing product support providers to reduce costs through innovation. The details behind a strategy where performance requirements are aligned with a provider’s opportunities to improve and exercise innovation are specific to the system being supported and its operating environment. Therefore, while the process may be similar, the solution will be unique to the specific system, subsystem, or component being supported.

12. Exhaustive and expensive BCAs are required to develop a PBL strategy.

The requirement for BCAs is that they be sufficiently robust to allow the decision makers to make well-informed decisions. This is accomplished by performing the appropriate level of analysis to evaluate the costs, benefits, and risk implications of the product support alternatives being considered. The guidance provided in the *DOD BCA Guide Book* addresses the full range of analyses options – from that required to inform decisions associated with extremely large and extremely complex situations to much simpler PBL analytic challenges. There is no requirement or need to apply the full range of BCA analyses contained in the *Guide Book* to every PBL initiative. PSMs are encouraged to tailor the BCA to the complexity of their unique situations. Moreover, when PBLs are being renegotiated or re-competed, greater transparency of financial data should allow for significantly streamlined BCAs. Bottom line: BCA’s need not be exhaustive, expensive or time consuming.

13. PBL arrangements lock Services into long term, inflexible contracts.

Properly crafted PBL arrangements have appropriate off ramps in the arrangement to safeguard both the Services and the Commercial Providers from significant changes in scope. Nevertheless, the duration of the PBL arrangement impacts the degree to which a Commercial provider can pass along cost savings and drive improvements.

14. PBL arrangements can only be successful for sub-systems or components.

PBL arrangements can be and have been successful at the system, subsystem, and component level. The key to success is being properly structured and executed, regardless of what is being supported. That said, there may be more complexity to a system level PBL arrangement compared to a subsystem or component that will require more skill and expertise to structure and execute.

15. All equipment should be maintained under a PBL arrangement.

All equipment should be maintained in a way that delivers the best value to the government. PBL arrangements are most successful when they adhere to the PBL tenets and are applied under the circumstances outlined in the PBL Comprehensive Guidance Document released by ASD (L&MR) in November 2013.

Tenets of PBL	Description
<p>Tenets Tied to Arrangements</p>	<ol style="list-style-type: none"> 1. Acquire clearly defined Warfighter-relevant outcomes, not just sustainment services or replacement equipment 2. Use measurable and manageable metrics that accurately assess the product support provider’s performance against delivery of targeted Warfighter outcomes 3. Provide significant incentives to the support provider that are tied to the achievement of the outcomes (for aspects of performance that are within their control) 4. Firm Fixed Price (FFP) contracts are generally the preferred contract type (Fixed Price Incentive Firm (FPIF) and Cost Plus Incentive Fee (CPIF) may be effective) 5. Provide sufficient contract length for the product support provider to recoup investments on improved product (e.g., Mean Time Between Failure (MTBF) and sustainment processes (e.g., manufacturing capabilities)

Tenets Tied to Organization	<ol style="list-style-type: none"> 6. PBL knowledge and resources are maintained for the Government team and product support providers 7. Leadership champions the effort throughout their organization(s) 8. Everyone with a vested interest in the outcome is involved 9. Supply chain activities are aligned to the desired PBL outcome versus disparate internal goals 10. Risk management is shared between the Government, customer, and support provider
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There will be scenarios where the sustainment environment of certain equipment will not lend itself to a PBL arrangement (i.e. remaining usage life is short, process/performance improvements can't be supported by the business case). Properly evaluating conditions is important to identifying the potential for utilizing a PBL arrangement.

16. PBL arrangements must be Firm Fixed Price Contracts.

Fixed-price contract variants are the preferred type because they provide the greatest incentive to the PSI and PSP to improve their products and processes and reduce their cost to perform. When the providers cost to deliver or the risk is difficult to determine, then a FPIF target contract with a ceiling price and a profit-sharing formula is appropriate. However, successful PBL arrangements have been implemented with CPIF contracts and may be the more appropriate arrangement when the risk cannot be reasonably quantified or the cost of transferring risk to the PSI or PSP is more than the Government will accept. Uncertainty and risk are used to determine the appropriate contract type while contract structure ensures alignment of the interests of the government and industry. The key to an effective PBL arrangement is using incentives to elicit the desired behavior/outcome from the PSI/PSP in spite of the guaranteed cost reimbursement.

17. PBL arrangements must have five year or more Periods of Performance.

While longer contract lengths justify provider investments to drive cost savings and reliability improvements, providers can still improve performance and cost with contract lengths less than five years. However, the degree to which they can make improvements will be tied to their ability to realize a return on their investment. The contract length that is needed to accomplish this will vary depending on the complexity of the equipment being supported and required investment to make improvements.

18. PBL and Contractor Logistics Support (CLS) are synonymous.

A PBL arrangement may or may not be a Contractor Logistics Support (CLS) arrangement. CLS simply indicates that industry is performing the sustainment work. Many CLS arrangements are transactional (e.g. non-PBL). In these non-PBL CLS arrangements the government is buying MRO services and/or replacement material. In CLS arrangements that are also PBLs, the government is buying defined sets of warfighter relevant outcomes via contracts that are typically multi-year and Firm Fixed Price. Warfighter relevant outcomes are most often expressed in terms of system, sub-system or component availability and/or reliability. The full range of PBL outcome

metrics is discussed in Appendix F. CLS PBL arrangements have target levels of performance assigned to a small number of Key Performance Indicators (KPI) with financial incentives and disincentives for meeting or failing to meet targeted performance levels. CLS PBL arrangements often have the added benefit of integrating the various product support activities (e.g., supply support, sustaining engineering, maintenance, etc.) of the supply chain with appropriate incentives and metrics. Finally, PBL's can be structured as government only, government-industry partnerships or industry only arrangements. Bottom line: PBL and CLS are not synonymous. Moreover, the government has complete control over how PBLs are structured – not industry.

19. The government relinquishes configuration control to the PBL provider:

DoD configuration managers are responsible for ensuring the correct configuration of hardware, software, and the information needed to employ them effectively for the operating forces and supporting activities. Some of these tasks may be performed by a commercial contractor as part of a PBL arrangement. However, regardless of the acquisition or support concepts employed, the DoD does not abdicate its responsibility for ensuring proper configuration control. Improvements to components and parts through increased reliability and reduced maintenance costs are encouraged, incentivized, and enabled via performance-based arrangements, but such changes are implemented using appropriate configuration control procedures.

20. PBL is a panacea that will correct all issues across the Integrated Product Support spectrum including reliability:

PBL will not overcome a lack of sustainment planning, make up for an absence of effective program systems engineering, succeed with inadequate funding, mitigate the effects of poor leadership, or deliver instantaneous results. By identifying targeted metrics and incentives that focus on performance outcomes such as readiness, reliability, availability, maintainability, cost, and obsolescence/Diminishing Manufacturing Sources and Material Shortages (DMSMS) mitigation, it is often possible to improve system, equipment or component performance. It is not guaranteed, however, particularly for legacy systems with a history of existing performance problems. To use a baseball analogy, DoD program managers and life cycle logisticians alike must recognize that ignoring early logistics design influence opportunities cannot be rescued by a PBL “diving basket catch” at the eleventh hour.

21. PBLs erode competition

When developing or re-competing PBL arrangements for equipment where there is more than one credible industry sustainment provider, Product Support Managers should execute a competitive solicitation. However, it is important to consider the following three points:

First, consolidations within the Aerospace and Defense Market Space, Intellectual Property ownership issues and other factors have resulted in an environment wherein

much of the Department's equipment inventory has only one credible commercial sustainment provider. The cost of entry into the sustainment market for much of the Defense equipment that is maintained via a sole source arrangement today is prohibitively high and therefore not feasible. Bottom line: For much of the Department's equipment inventory there is no opportunity for company-to-company competition.

Second, incumbents in any contract environment have inherent advantages over the competition at contract re-competition. Incumbents know the work and the customer at a level of detail not available to other companies, and they have zero learning curves. Incumbents operating under a PBL arrangement have an even greater advantage over the competition at contract re-competition. This added advantage results from the ones cited above plus the fact that PBL providers predictably drive cost out of every aspect of the sustainment value chain during the life of the contract and know what efficiencies are left to be harvested in the next Period of Performance – and their competition does not. Bottom line: Incumbents have inherent advantages over non-incumbents regardless of contract type. PBL incumbents have cost structure and price-to-the-government advantages that are greater than other contract type incumbents – all of which works to the government's distinct advantage.

Third, re-competing sustainment work on an annual basis drives up prices to the government. Preparing annual proposals is an expense which industry will built into its prices to the government. One year periods of performance severely restrict industry's willingness to invest in Mean time Between Failure (MTBF) improvements which results in more failures and higher prices to the government. One year contracts have more risk for industry than longer term contracts. Industry prices risk into its proposals. Bottom line: competition for the sake of competition works to the disadvantage of the government.

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3.3. Resource C: Acronyms

ACAT	Acquisition Category
AFI	Air Force Instruction
A _M	Materiel Availability
A _O	Operational Availability
ASD (L&MR)	Assistant Secretary of Defense (Logistics and Materiel Readiness)
ASR	Assembly Service Records
AT&L	Acquisition, Technology, and Logistics
BCA	Business Case Analysis
BBP	Better Buying Power
BRAC	Base Realignment and Closure
BVA	Best Value Alternative
CAPE	Cost Estimate and Program Evaluation
CDD	Capability Development Document
CLS	Contractor Logistics Support
CWT	Customer Wait Time
DASD (MR)	Deputy Assistant Secretary of Defense (Materiel Readiness)
DAU	Defense Acquisition University
DCAA	Defense Contract Audit Agency
DCMA	Defense Contract Management Agency
DLA	Defense Logistics Agency
DMSMS	Diminished Manufacturing Sources and Material Shortage
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction

DON	Department of the Navy
EMD	Engineering and Manufacturing Development
ECP	Engineering Change Proposal
FFP	Firm Fixed Price
FIAR	Financial Improvement and Audit Readiness
FPIF	Fixed Price Incentive Firm
FMECA	Failure Modes Effects & Criticality Analysis
FRACAS	Failure Reporting and Corrective Action System
FSR	Field Service Representative
GAO	Government Accountability Office
GSS	Generic Subsystem
ICP	Inventory Control Point
IPS	Integrated Product Support
IPT	Integrated Product Team
IS	Information System
J&A	Justification and Approval
JCIDS	Joint Capabilities Integration Development System
JROC	Joint Requirements Oversight Council
KPI	Key Performance Indicator
KPP	Key Performance Parameter
KSA	Key System Attribute
LCC	Life Cycle Costs
LCSP	Life Cycle Sustainment Plan
LORA	Level of Repair Analysis
LRU	Line Replaceable Unit

MDA	Milestone Decision Authority
MDAP	Major Defense Acquisition Program
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MRIL	Master Repairable Item List
MRO	Maintenance, Repair, and Overhaul
MSA	Material Solution Analysis
MTA	Maintenance Task Analysis
MTBF	Mean Time Between Failure
MTTR	Mean Time to Repair
NAVAIR	Naval Air Systems Command
NAVSEA	Naval Sea Systems Command
NAVSUP WSS	Naval Supply Systems Command Weapons System Support
NDA	Non-Disclosure Agreement
NEOF	No Evidence of Failure
NG PBL	Next Generation Performance-Based Logistics
NPV	Net Present Value
NR	Net Ready
NRFI	Not Ready For Issue
NSN	National Stock Number
O&M	Operations and Maintenance
O&S	Operating and Support
ODASD (MR)	Office of Deputy Assistant Secretary of Defense (Materiel Readiness)
OEM	Original Equipment Manufacturer
OPTEMPO	Operations Tempo

OSD	Office of Secretary of Defense
OT&E	Operational Test and Evaluation
PBL	Performance-Based Logistics
PCO	Procurement Contracting Officer
PEO	Program Executive Officer
PM	Program Manager
PMO	Program Management Office
POA&M	Plan of Action and Milestones
POC	Point of Contact
PoP	Period of Performance
PPP	Public Private Partnership
PSA	Product Support Arrangements
PSI	Product Support Integrator
PSBM	Product Support Business Model
PSM IPT	Product Support Management IPT
PSM	Product Support Manager
PSP	Product Support Provider
PWS	Performance Work Statement
QA	Quality Assurance
QDR	Quadrennial Defense Review
RAM	Reliability, Availability, and Maintainability
RCM	Reliability-Centered Maintenance
RDT&E	Research, Development, Test, and Evaluation
RFI	Request for Information
RFI	Ready for Issue

ROIC	Return on Invested Capital
R	Reliability
RTAT	Repair Turn Around Time
SAE	Senior Acquisition Executives
SME	Subject Matter Expert
SOO	Statement of Objective
S&RP	Standard and Repeatable Process
SSA	Software Support Activity
SSE	Software Support Environment
TDP	Technical Data Package
UMMIPS	Uniform Material Movement and Issue Priority System
USD (AT&L)	Under Secretary of Defense (Acquisition Technology, and Logistics)
WCF	Working Capital Fund

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3.5. Appendix A: PBL Tenets - Characteristics that Drive Optimal Outcomes

As with any approach to executing a complex acquisition and/or sustainment strategy, there are certain desired characteristics necessary to drive optimal outcomes. For PBL, these characteristics are commonly referred to as the “Tenets of PBL.” Originally developed for the U.S. Air Force by the University of Tennessee³⁹, the Tenets of PBL were adopted by OSD in December 2012 as guidelines for best practice in PBL. Since then, the tenets and grouping have evolved in use by DoD, leading to incorporation into this document. However, the principles underpinning the tenets are the same regardless of the grouping.

Tenets of PBL	Description
Tenets Tied to Arrangements	<ol style="list-style-type: none"> 1. Acquire clearly defined Warfighter relevant outcomes - not just sustainment services or replacement equipment 2. Use measurable and manageable metrics that accurately assess the product support provider’s performance against delivery of targeted Warfighter outcomes 3. Provide significant incentives to the support provider that are tied to the achievement of outcomes (for aspects of performance that are within their control) 4. FFP contracts are generally the preferred contract type (FPIF and CPIF may be effective) 5. Provide sufficient contract length for the product support provider to recoup investments on improved product (e.g., MTBF) and sustainment processes (e.g. manufacturing capabilities)
Tenets Tied to Organization	<ol style="list-style-type: none"> 6. PBL knowledge and resources are maintained for Government team and product support providers 7. Leadership champions the effort throughout their organization(s) 8. Everyone with a vested interest in the outcome is involved 9. Supply chain activities are aligned to the desired PBL outcome, vice disparate internal goals 10. Risk management is shared between the Government customer and support provider

Tenets of PBL

Tenet #1: Acquire clearly defined Warfighter relevant outcomes - not just sustainment services or replacement equipment

The PBL strategy should be focused on Warfighter product support requirements and structure the associated PBL arrangements to deliver outcomes that are tied to the Warfighter requirements. Workloads should be distributed to the most effective providers consistent with statutory guidelines, and with a conscientious effort to focus on best competencies, best value, and effective use of PPP solutions. The activities of the PSI and PSP are aligned with the

³⁹ UT developed PBL tenets may be found at <https://acc.dau.mil/CommunityBrowser.aspx?id=527150>

Warfighter requirements and monitored with metrics that are consistent with the responsibility and risk delegated to them. This is counter to traditional transactional approaches where the Government procures products and services without linking the consumption of the resources with the desired Warfighter outcomes.

Tenet #2: Use measurable and manageable metrics that accurately assess the product support provider's performance against delivery of targeted Warfighter outcomes

Performance metrics are vital to the success of a PBL arrangement. The Government needs insight into program performance to determine compliance with performance requirements and level of mission success. For example, one important area to gather measurement data is related supply chain performance, as these are associated with key performance indicators such as materiel availability and operations and support costs. The PSM is responsible for the performance of the product support solution and will use Warfighter relevant metrics to monitor its performance. Metrics assigned to the PSI or PSP reflect the responsibilities assigned to them. They should not reflect outcomes that are beyond the PSI/PSP ability to influence and are not part of the arrangement. The selected metrics should be measurable and manageable and map back to the higher-level program metrics. For example, a PSP may be responsible for the availability of their product and the associated metric may be supply material availability or logistics response time. Too many metrics make it difficult to manage and may also work at cross purposes to each other. Also, data must be available for the metric. There have been occasions where metrics were required as part of an arrangement without the ability to collect the data to determine performance against the metric.

Tenet #3: Provide significant incentives to the support provider that are tied to the achievement of outcomes (for aspects of performance that are within their control)

An incentive is anything that encourages or motivates somebody to do something. With respect to PBL arrangements, it is any term or condition that encourages the desired product support integrator and/or provider behavior to deliver the relevant Warfighter outcome (for aspects of performance that are within their control). The incentive may be related to contract type, contract length, or incentive fees (or penalties). A FFP contract provides the strongest incentive for the provider to control costs. However, FFP contracts do not share these savings with the Government, and without additional mechanisms (e.g., Contract Data Requirements Lists (CDRLs)), they do not provide the information needed by the Government to understand actual costs for negotiations on future PBL contracts. Another powerful incentive is the ability to receive extensions to the duration of the contract (award term) with good performance. This provides stability to the provider's order book and adds shareholder value. Incentives that focus on profit may not be applicable for public facilities, but increased percentage of available workload, promotions, bonuses, and spot awards are all possible incentives along with the desire to positively impact Warfighter outcomes. Whatever form the incentive takes, it should be sufficient to ensure the desired behavior and outcome over a range of conditions.

Tenet #4: FFP contract is generally the preferred contract type (however, FPIF and CPIF may be effective)

When coupled with a requirement to deliver a Warfighter relevant outcome versus delivery of a part or service, a FFP contract converts a traditional revenue center in a transactional business model to a cost center under PBL. The provider is required to deliver a specific Warfighter relevant outcome for a set price. It transfers the financial risk from the Government to the provider. In this fashion, it acts as a powerful incentive for PSIs and PSPs to improve the reliability of their product and the efficiency of their processes in order to reduce their cost to deliver the desired outcome. The lower their cost to perform, the greater the provider profit associated with the fixed price. In order to transfer risk in this fashion to the provider, the failure modes and rates need to be stable enough to reasonably forecast demand. Otherwise, the provider will price in the difficulty with assessing the risk ultimately becoming an unaffordable option.

As the uncertainty and associated risk increases, a more appropriate contract type would be a FPIF or a CPIF arrangement. FPIF contracts provide a mechanism for the provider to reduce costs while sharing those cost savings with the Government. Without sharing, there can be instances when the Government does not fully understand the actual costs or the cost-saving opportunities available to the provider. The further the contract type moves from FFP and FPIF toward cost plus, the less incentive there is for the provider to improve the product and lean out their processes (without reasonable assurance of a follow-on arrangement). Conversely, a cost-plus fixed-fee contract is generally not appropriate for PBL arrangements.

Tenet #5: Provide sufficient contract length for the product support provider to recoup investments on improved product (e.g., MTBF) and sustainment processes (e.g., manufacturing capabilities)

PBLs contribute to minimizing operational risk by incentivizing the PSI and PSP to invest in improving their product and processes in support of Warfighter relevant outcomes. However, this requires an appropriate contract length aligned with the desired investment to provide the PSI or PSP an opportunity to realize a return on their investment. A provider would want the improved component to go through at least one repair cycle so they have an opportunity to recoup their investment. For example, a component with a shop visit interval of approximately three years would warrant a five-year base period to recoup the investment. The length of the contract will depend on the complexity of the product and the size of the investment. The PSM and Contracting Officer will need to work with their PSI and PSP counterparts to determine the contract length that is appropriate for their specific arrangement.

Tenet #6: PBL knowledge and resources are maintained for Government team and product support providers

The most successful PBL programs are those where both the Government organization and the PSI and PSP have a comprehensive knowledge of and experience in performance-based concepts, tenets, business models, and implementation strategies at the beginning of their program efforts. The very best programs assemble a PBL team comprising Government and the support provider representatives, and tend to include several people with prior PBL management experience.

Tenet #7: Leadership champions the effort throughout their organization(s)

A successful PBL strategy and subsequent arrangements require the support of leadership and all stakeholders throughout the Government and PSI/PSP organizations. It is particularly important for Government leadership to create an environment that facilitates broadly implementing PBL solutions across DoD. This philosophy must flow down through the organization such that the PM and PSM are enabled to develop and execute performance-based solutions without undue oversight or review when compared with other approaches.

Tenet #8: Everyone with a vested interest in the outcome is involved

Organizational alignment is a strategically focused approach that synchronizes efforts throughout all levels of the organization, starting with leadership down to the shop floor of both customer and supplier organizations. Leadership may champion PBL, while the lower levels of the workforce may be less than enthusiastic (or vice versa). Situations like this can become emotionally charged, and a concerted effort to align all parties involved in the execution of the strategy pays big dividends upon execution with a win-win proposition for the entire team. This includes internal and external stakeholders that they should be involved as early in the process as possible. The goal is to drive strong consensus and participation toward common support strategy objectives. An agreement across all stakeholders that establishes PBL performance and associated metrics that align with the required operational outcomes is essential.

Tenet #9: Supply chain activities are aligned to the desired PBL outcome, vice disparate internal goals

PBL focuses on optimizing the effectiveness of the end-to-end process, while traditional sustainment contracts manage the supply chain by commodities or services. The PSM must develop a management strategy as part of the LCSP, which integrates and aligns functions of the various PSIs and PSPs (commercial and public) to optimize the complete supply chain process. Internally stove-piped processes must be reduced or eliminated. Portions of the supply chain's effectiveness should not be measured with metrics that are not aligned with the desired performance outcome for the Warfighter. For some programs, co-location of the support provider and the Government team in a PPP arrangement has proven to facilitate cohesive, comprehensive and coordinated customer and supplier supply chain efficiency.

Tenet #10: Risk management is shared between the Government customer and support provider

Robust PBL solutions include a focus on total program risk reduction along with appropriate off-ramp exit criteria that are captured at the onset of the contract execution. These programs balance risk with mitigation strategies that account for all parties involved, while paying specific attention to harmonizing supplier accountability and authority. By moving some risk to the support provider, and aligning incentives to stimulate program effectiveness, the product support business model can remove risk from the total system. PBL is about realigning the incentives to reduce total program risk.

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3.6. Appendix B: Generic Subsystem PSM IPT Charter Example⁴⁰

1.0 Generic Subsystem PSM IPT Purpose and Scope

The GSS PSM IPT is established to develop a product support strategy for the GSS that satisfies Warfighter requirements. The GSS PSM IPT is assembled to bring together different areas of expertise across the SYSCOM and LOGCOM with the appropriate knowledge, authority, and responsibility needed to contribute to the development and deployment of the GSS product support strategy.

The objective of this PSM IPT is to facilitate the successful long-term implementation of the GSS product support strategy and implement performance-based arrangements as appropriate.

This charter governs the activities of the GSS PSM IPT members, who have individual and collective responsibilities for coordinating and carrying out the activities required to successfully complete each phase of the analysis and implementation and provide the deliverables identified within this charter.

The GSS PSM IPT is herein chartered to develop an optimized, best value GSS product support strategy and a workforce capable of implementing and successfully managing arrangement(s) issued to realize the strategy.

Deliverables:

- Diagnostic assessment
- Partnership assessment
- Business case analysis of alternatives
- GSS product support recommendation
- GSS product support implementation plan (including draft RFP if applicable)
- Monthly executive summary reviews

2.0 Membership

Project Sponsor

- SES for GSS Sustainment Command or PEO for GSS System

Project Champion

- PM for GSS System

PSM IPT

- GSS PSM (Chair)
- GSS System Engineer

⁴⁰ This charter is provided as an example of structure and key considerations for a charter. It is not intended to prescribe what a charter must look like.

- GSS Contracting Officer
- GSS Business/Cost Estimator
- GSS Warfighter Command Representative
- Sustainment Command Logistician Representative

Ad-Hoc Members

The PSM IPT may invite other personnel to participate in or contribute to meetings on an ad hoc basis. Table 1 lists communities who may be invited to participate in PSM IPT meetings as appropriate.

Table 1: Additional Participant Communities		
DCMA	Resource Sponsor	Service ICP
OEM	General Counsel	DCAA
Comptroller	Training Command	DLA

Given the planned duration of the project, continuity of membership is an important aspect. Each participating organization should be represented by an empowered, permanently assigned member.

3.0 Roles and Responsibilities

The GSS PSM IPT shall:

- Serve as their organizational representative in the development/update of the GSS product support strategy
- Provide recommendations to the PSM IPT chair
- Coordinate with other functional groups, such as the Test and Evaluation Working IPT (T&E WIPT) and the Training Support Work Group, to ensure an integrated effort
- Share knowledge, expertise, resources, best practices, and related efforts from their organization
- Provide status updates to leadership and practitioners within their organization
- Solicit input and feedback from stakeholders on product support-related issues
- Identify and seek to remove risks and barriers to long-term implementation
- Identify other knowledgeable individuals who can contribute to the effort
- Assist with executing product support strategy as required

4.0 Rules and Procedures

Working Groups

Working groups (WG) consisting of permanent and ad hoc members may be created to explore specific topics requiring specialized knowledge. Following the establishment of a WG, the project lead and working group will create target dates to finalize decisions or recommendations.

The WG will present their findings and recommendations during a scheduled PSM IPT meeting or if required, at a special meeting, where the full group will discuss the results.

Decision Process

As a deliberative body, the PSM IPT will generate recommendations on the GSS product support strategy for the PSM, PM, PEO, and others as appropriate (should be clearly identified for each program).

5.0 Operations Tempo

The PSM IPT will meet twice per month, and members are expected to review materials and provide feedback between meetings. There will be two types of meetings: Status Sessions and Working Sessions.

Status Sessions: Teleconference; first Wednesday of each month

- Update on progress toward milestones and deliverables
- Opportunity for PSM IPT members to discuss and provide feedback on milestones and deliverables
- Review agenda and required tasks for next Working Session

Working Sessions: In person; third Wednesday of each month

- More thorough in-person discussion of project deliverables and milestones
- Finalize and approve deliverables as they are completed
- Discuss specific challenges and lessons learned
- Report progress on implementing the product support strategy

6.0 Governance

The PM and PSM will have the primary responsibility for implementing the product support strategy for GSS. The role of other organizations in GSS governance is outlined in Table 2. The governance diagram shows the relationship of the PSM IPT to the leadership of the Service logistics and acquisition communities.

Table 2: Governing Bodies	
PEO, Systems, and Logistics Commands	<ul style="list-style-type: none"> • Serve as Product Support/PBL Executive Sponsors • Champion PBL within their Service or Agency • Provide oversight and support to PSM IPT • Provide feedback and input on project strategy and deliverables (as appropriate) • Advise and approve key recommendations and major deliverables • Identify and assign appropriate resources to support efforts • Identify and remove risks and barriers to PSM IPT success and long-term implementation

Others	<ul style="list-style-type: none">• May include Resource Sponsor and Warfighter Commands
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3.7. Appendix C: Knowledge Transfer and PSM IPT Training

Assessment of PSM IPT’s PBL Knowledge

Prior to the development of any product support solution, an assessment of the PSM IPT is recommended to gauge the understanding and level of experience with PBL. The PSM is responsible for implementing the assessment. The purpose of this assessment is to ensure that the team possesses the requisite knowledge to successfully develop and execute a performance-based solution. The results will identify gaps in the PSM IPT’s PBL knowledge and indicate where training may be necessary. Rectifying gaps in PBL knowledge are addressed in the PBL Knowledge Transfer section below.

Various methods may be utilized to assess the PSM IPT’s PBL knowledge. The assessment may be based on selecting IPS elements to develop a baseline survey of PBL knowledge among the PSM IPT with respect to product support functions. In Figure 1, six IPS elements are outlined to depict the most relevant IPS elements to GSS. The PMO may select other IPS elements depending on the issues most critical to its program.

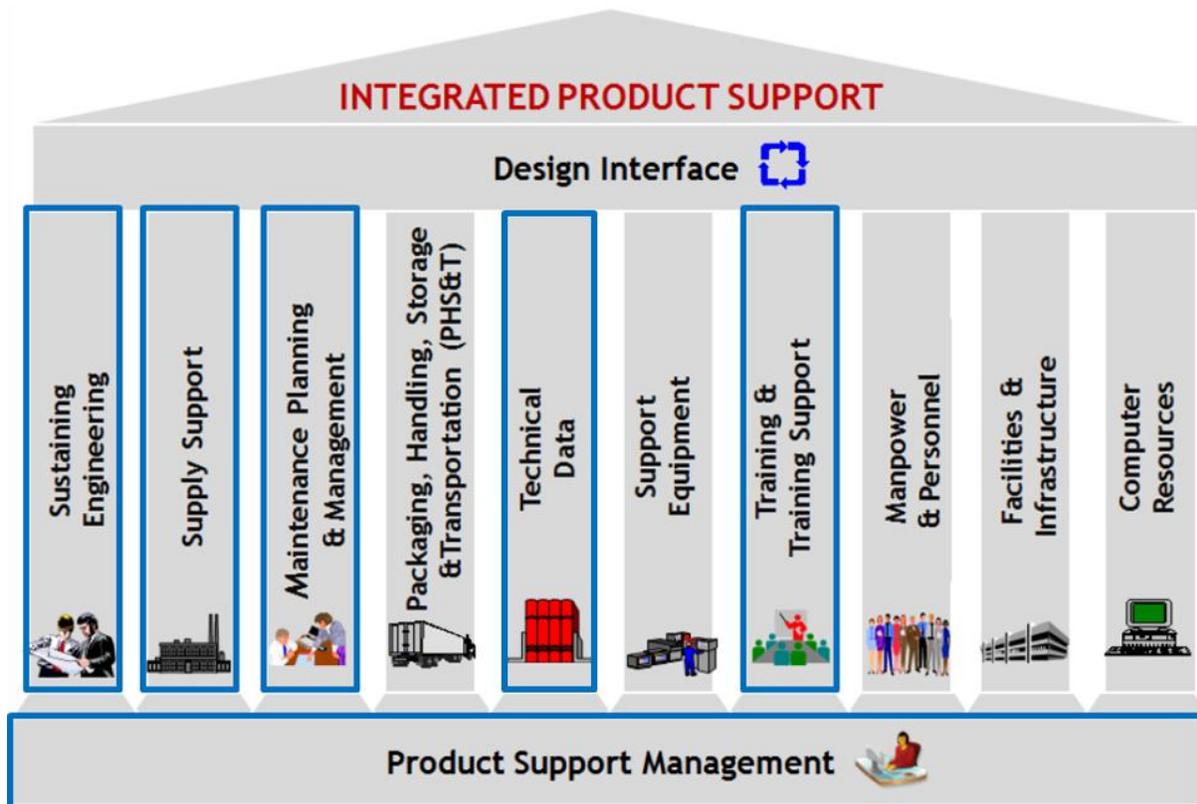


Figure 1: IPS Elements Selection Framework for Assessing Team Capability

Further information and guidance regarding the IPS elements can be found in the [DAU Integrated Product Support Element Guidebook](#).

Responses to the survey help qualitatively rate each team member’s PBL knowledge by the level of maturity for each IPS element considered. The example below (Figure 2) illustrates how each IPS element is broken down into three focus areas: Customer and Strategy, People and Organization, and Process and Operations. The assessment results should drive recommendations on additional PBL training and help provide recommendations toward a training road map. In Figure 2, the example shows the starting point of an illustrative system in terms of PSM IPT capabilities, and how it can mature when measured against the Product Support Management IPS element.

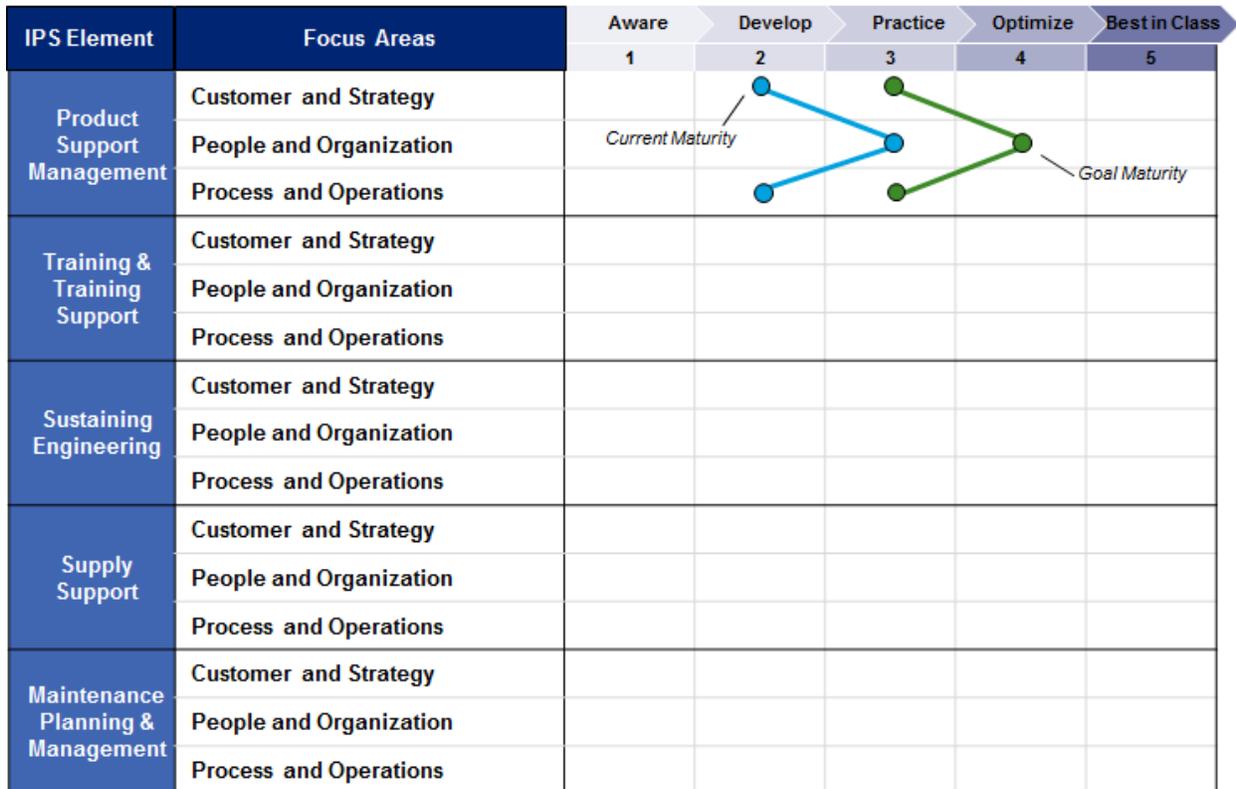


Figure 2. Notional Assessment Output of Team’s PBL Experience Survey

If the assessment indicates a gap in PBL knowledge among the stakeholders, the PSM should arrange a kickoff brief on PBL training fundamentals. The kickoff brief should cover meeting goals, an overview of the DoD Product Support Business Model and an introduction to the development process. For fielded systems, providing this kickoff brief prior to the “Baseline the System” in Step 3 will enable the team to become familiarized with possible changes to their current sustainment arrangement. For developmental systems, this assessment will help the team identify gaps in PBL knowledge for future arrangements. Additionally, at the end of the kickoff brief, the members will have the opportunity to express any questions or concerns before Step 3.

PBL Knowledge Transfer

The shift from transactional sustainment to an outcome-based model requires understanding that constitutes an effective product support strategy. In order for a PBL arrangement to be effective, the PSM should ensure the PM, PMO leads, and

PBL Leading Practice(s)
 Engage commercial providers early in the process. For example, involve them with the PBL Knowledge Transfer.

supporting stakeholders are fully aware of the change required and how best to execute these new requirements. If the members of the PSM IPT have the needed experience and expertise, the following PBL Knowledge transfer actions can be skipped.

Depending on the team’s level of understanding regarding PBL, formal classroom training may be appropriate. PBL training is available through DAU, and training courses and continuous learning modules are listed on DAU’s iCatalog at <http://icatalog.dau.mil/>. DAU’s [PBL Community of Practice \(CoP\)](#), [ACQuipedia](#), and [Ask A Professor \(AAP\)](#) sites are also useful knowledge-sharing resources for frequently asked questions, tools, and training. The PSM should ensure that all product support team members are aware of DAU’s PBL training and knowledge-sharing resources. A more complete list of DAU’s PBL training and knowledge-sharing resources is included in Appendix C.

For organizations with limited PBL experience, a structured approach to workforce knowledge development will increase the probability of successful PBL implementation. Organizations should develop and maintain a listing of PBL SMEs to facilitate internal knowledge transfer. An approach consisting of initial baselining workshops led by experienced professionals, coupled with periodic reviews and follow-up sessions, has been shown to produce beneficial knowledge transfer results. For the purposes of this document, PBL Knowledge Transfer has three contexts:

1. Training of PMs, PSMs, Contracting Officers, and others in the practices of performance-based product support
2. Sharing knowledge and experiences between Government officials within and across organizations
3. Possessing technical knowledge of systems, subsystems, and components

Tailoring these sessions to the needs and capabilities of the workforce will maximize effectiveness and enhance the benefits of performance-based product support strategies. These knowledge exchanges will span from initial training in PBL fundamentals to refresher training on PBL tactical/administrative skills to lessons learned sessions between seasoned PBL practitioners. The DoD is positioned to reap tremendous benefits from performance-based product support solutions through the collaborative exchange of best practices and lessons learned. A typical knowledge transfer is comprising the three stages below.



The Introduction to PBL involves training on the basic tenets of PBL. This training may be accomplished with available online training or on-site instruction. The goals are to strengthen the team’s PBL knowledge in the following areas:

- Understanding the business model paradigm shift (from transactional-based to outcome-based approach)
- Familiarization with the PBL process
- Introduction to the 10 tenets of PBL

The optimal training format is a tailored program-specific classroom workshop. Tailored classroom training can be accessed via DAU (TTL 001 Performance-Based Logistics (PBL) Targeted Training), Academia (e.g., University of Tennessee), or commercial sources. For the most effective training environment, there should be a limited number of total students, while

still maintaining adequate stakeholder participation from the PM, Engineering, Legal, Contracting, Business/Financial Management, or other communities.

Whether the PMO has executed informal PBL training or has participated in a more formal targeted training workshop, the outcome of this phase should be the same. By the end of the Introduction to PBL phase, the PSM IPT should have a better sense of why PBL is preferred over the existing transactional approaches and should become familiarized with the PBL business model.



In the Program-Specific Applicability phase, the PSM IPT should perform a self-assessment and identify potential gaps and solutions. Training in this phase lasts approximately for two days. The below list of activities may be performed during the Program-Specific Applicability phase:

- Review the 10 PBL tenets from the previous day
- Assess the likelihood of PBL success of weapon system against the PBL tenets
- Identify and prioritize resolution of PBL knowledge gaps
- Develop a timeline/POAM to address each solution



The Recurring/Follow-Up Trainings phase consists of periodic progress monitoring to gauge the PSM IPT's grasp of PBL. It is recommended that the PM review the progress every 60 days and meet with the PSM IPT to address any concerns with the established POAM. These reviews may help the program progress toward closing the gaps identified during the self-assessment.

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3.8. Appendix D: DAU's PBL Training and Knowledge-Sharing Resources

DAU offers Continuous Learning (CL) on the subject of product support, sustainment, and maintenance on the DAU Continuous Learning Site under the CLL (Logistics) tab. Some of the modules related to these topics include:

- [CLL 001](#): Life Cycle Management & Sustainment Metrics
- [CLL 005](#): Developing a Life Cycle Sustainment Plan (LCSP)
- [CLL 006](#): Depot Maintenance Partnering
- [CLL 011](#): Performance-Based Life Cycle Product Support (PBL)
- [CLL 015](#): Product Support Business Case Analysis (BCA)
- [CLL 020](#): Independent Logistics Assessments
- [CLL 022](#): Title 10 Depot Maintenance Statute Overview
- [CLL 023](#): Title 10 U.S.C. 2464 Core Statute Implementation
- [CLL 024](#): Title 10 Limitations on the Performance of Depot-Level Maintenance
- [CLL 025](#): Depot Maintenance Interservice Support Agreements (DMISA)
- [CLL 026](#): Depot Maintenance Capacity Measurement
- [CLL 029](#): Condition-Based Maintenance (CBM) Plus
- [CLL 030](#): Reliability-Centered Maintenance (RCM)
- [CLL 035](#): O&S Cost Estimating for the Product Support Manager
- [CLL 036](#): Product Support Manager
- [CLL 039](#): Product Support & Sustainment Requirements Identification
- [CLL 040](#): Business Case Analysis (BCA) Tools
- [CLL 041](#): Life Cycle Cost (LCC) Analysis Tools
- [CLL 046](#): The 12 Integrated Product Support (IPS) Elements
- [CLL 056](#): Sustainment of Software Intensive Systems
- [CLL 201](#): Diminishing Manufacturing Sources & Material Shortages (DMSMS) Fundamentals

Additionally, a variety of DAU certification courses identified at all three levels of the Defense Acquisition Workforce Improvement Act (DAWIA) for Life Cycle Logistics career field certification and core-plus development address-related topics such as maintenance planning, sustainment, product support, and sustainment. The major courses include:

- [LOG 101](#): Acquisition Logistics Fundamentals
- [LOG 102](#): Fundamentals of System Sustainment Management
- [LOG 103](#): Reliability, Availability, and Maintainability (RAM)
- [LOG 200](#): Intermediate Acquisition Logistics (Part A)
- [LOG 201](#): Intermediate Acquisition Logistics (Part B)
- [LOG 206](#): Intermediate System Sustainment Management
- [LOG 211](#): Supportability Analysis
- [LOG 215](#): Technical Data Management (in development)
- [LOG 235](#): Performance-Based Logistics (PBL)
- [LOG 340](#): Life Cycle Product Support
- [LOG 350](#): Enterprise Life Cycle Logistics Management

CLL 011, CLL 015, and LOG 235 are part of the core-plus guide for most of the other PBL-related Acquisition career fields, but all PBL professionals, regardless of Defense Acquisition Workforce career field are encouraged to take pertinent Life Cycle Logistics training courses.

Other relevant training open to all Acquisition career fields includes, but is not limited to, the following:

- CLM 014: IPT Management and Leadership
- CLM 074: Technical Data and Computer Software Rights
- CLR 101: Introduction to the Joint Capabilities Integration & Development System
- RQM 110: Core Concepts for Requirements Management
- CLM 031: Improved Statement of Work
- TTM 008: Developing Performance Requirements for Service Acquisitions
- TTM 009: Work Statement Workshop (SOW, SOO, PWS)
- CLB 016: Introduction to Earned Value Management
- CLB 017: Performance Measurement Baseline
- CLB 20: Baseline Management
- CON 100: Shaping Smart Business Arrangements

These and additional training courses and continuous learning modules are listed on DAU's iCatalog at <http://icatalog.dau.mil/>.

There are also numerous related DAU ACQuipedia Articles available at <https://dap.dau.mil/acquipedia/Pages/Default.aspx>.

The Acquisition Community Connection (ACC) Practice Center and Defense Acquisition Portal (DAP) are also valuable resources for information. A few relevant items include:

- “Should Cost” Analysis Literature Review (<https://acc.dau.mil/CommunityBrowser.aspx?id=399121>)
- DoD Market Research Report Guide for Improving the Tradecraft in Services Acquisition, Version 1.0 - April 2012 (<https://acc.dau.mil/CommunityBrowser.aspx?id=517109>)
- Performance Based Logistics Community of Practice (PBL CoP) (<https://acc.dau.mil/pbl>)
- Product Support Policy, Guidance, Tools & Training site (<https://acc.dau.mil/productsupport>)
- Logistics Community of Practice (LOG CoP) (<https://acc.dau.mil/log>)
- PSM Toolkit (<https://acc.dau.mil/psmtoolkit>)
- Better Buying Power (BBP) site (<http://bbp.dau.mil/>)
- Software Acquisition Management (<https://acc.dau.mil/sam>)

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3.9. Appendix E: Expansion of Key Considerations to Baseline the System

Key Considerations	
Maintenance Planning and Management	
Is the current maintenance planning and management strategy satisfying Warfighter requirements?	<p><u>Questions the team should consider:</u></p> <ul style="list-style-type: none"> • Are current performance levels meeting customer requirements? When the customer requirements are not met due to poor performance levels, this could be an indication that there are gaps in the current sustainment strategy. • How does this asset’s performance affect its platform readiness? If the performance levels of its subsystems and components are not meeting their targets, overall platform availability may decrease to the point where the asset ceases to meet Warfighter requirements. • What are the historical and projected values for sustainment spend? The historical and projected values for sustainment spend should be analyzed to see if there are deviations from the target or budgeted cost. If there are spikes in these values, the specifics should be investigated for subsystem or component issues.
Can the maintenance process (fault reporting, transportation, workload management, etc.) be made more efficient?	<p>A maintenance process flow diagram should be created to show the different steps that an unserviceable asset experiences until it is fully repaired. When examining the maintenance process, the PSM IPT should consider the average number of maintenance days required per unit, and the quarterly demand rate for maintenance. Another consideration is how many of the candidate assets are in inventory and are subject to sustainment financial obligation. Assets with a larger number of units in inventory typically present a greater opportunity for cost savings. The PSM IPT should also identify any inefficiency that could potentially be eliminated by introducing performance-based incentives.</p>
Are there any substantial delays in the repair process?	<p>The team should review the current maintenance and repair processes and identify any delays, issues, or opportunities for improvement that could be addressed by introducing a performance-based arrangement. The team should focus on identifying bottlenecks in the process step where the duration is the greatest and resolve that issue first. When identifying issues in the repair process, the team should also investigate the root causes to better understand the reason for delays. Even when Warfighter requirements are being satisfied, it is possible for a PBL to deliver greater efficiency leading to improved process agility and/or</p>

	reduced cost.
Can sustainment planning and demand forecasting be more accurate and efficient through the introduction of performance incentives?	Under a PBL, if the PSP is held accountable for an outcome that is impacted by the accuracy of the demand forecast, the PSP will be incentivized to assist the PMO with improving this forecast. If the PSP provides maintenance services, for example, the PSP may have more detailed information about failure rates and system reliability across the fleet that will improve the demand forecast.
Supply Support	
Is the supply support strategy satisfying Warfighter requirements?	The team should verify whether the Warfighter requirement metrics are being met from a supply perspective. If they are not being met, the team should try to identify the percentage of non-mission capable assets due to supply shortages. This should give the team a starting point to assess opportunities to resolve these shortages through performance-based arrangements with a PSI or PSP.
Can the supporting supply chains be made more efficient through the introduction of performance incentives?	The current state of supply support should also be analyzed to find opportunities to increase readiness and reduce cost when pursuing a change in sustainment arrangement. A well-structured PBL would provide incentives for the product support integrator to reduce supply chain inefficiency. A long-term PBL contract would provide the product support integrator the opportunity to recoup investments in process improvements, lay-in of spare parts, and redesign of components for improved reliability. Depending on the scope of a potential performance-based PSA, the integrator could be responsible for reducing delays and inefficiencies across the entire supply chain. Based on these opportunities, the Program Manager can determine if the timing and current state of their program will allow a smooth transition into a performance-based arrangement.
Are there any substantial delays in the procurement process for spare parts or new units?	One process that impacts the system’s availability may be the lack of repair parts. For example, delays, DMSMS issues, packaging issues, and poor inventory management are potential causes of materiel availability problems. Performance incentives will encourage suppliers to reduce their internal transaction lead time, particularly improving their make and delivery processes to mitigate the shortages of the Warfighter.

<p>Are there any significant inventory build-ups at any stage in the supply chain?</p>	<p>Significant inventory build-ups are a sign of supply support inefficiencies, potentially a bottleneck in the process. The process right before may be overproducing, or perhaps the process right after is unable to keep up due to quality issues. In order for material to flow smoothly, the entire supply chain must be leveled.</p>
<p>Are there any obsolescence or DMSMS concerns?</p>	<p>Many POs must confront issues with obsolescence and DMSMS within their supply chain, as technologies change and some sources or materials are no longer available. These issues can be mitigated through active management and monitoring efforts, which should involve the relevant industry participants. A performance-based arrangement could be structured to hold the PSP responsible for ensuring the availability of parts that are subject to obsolescence or DMSMS concerns, which would require the PSP to actively manage these concerns in coordination with the PO.</p>
<p>Market Space for Sustainment Providers</p>	
<p>Is the supply support strategy satisfying Warfighter requirements?</p>	<p>The team should verify whether the Warfighter requirement metrics are being met from a supply perspective. If they are not being met, the team should try to identify the percentage of non-mission capable assets due to supply shortages. This should give the team a starting point to assess opportunities to resolve these shortages through performance-based arrangements with a PSI or PSP.</p>
<p>Does the organic workforce have access to system technical data?</p>	<p>The ownership of data rights should be examined to help determine the feasibility of an arrangement change based on technical data availability. If Government owns the technical data, the program has more options to pursue a PBL, because it can choose among multiple potential providers. If the technical data package or data rights are not purchased as part of the initial acquisition, limitations can occur for that particular program. If a lack of technical data rights exists, Services will be limited to the removal and installation of units. This also places limitations on conducting diagnostic testing and work against organic or other alternate repairs. If contracts with subcontractors exist, restrictions in independently selling technical data to that Service also confine the Service’s range of future sustainment options.</p>

<p>What is the scope of opportunity?</p>	<p>A repair part or repairable used on multiple systems or an end item used by more than one military Service provides the opportunity to evaluate an enterprise-wide arrangement. There is a potential to save in terms of maintenance spend and inventory costs by aggregating the requirements and improving supply chain efficiency. Generally, the larger aggregated requirement improves the negotiating position of the Government during contract discussions. An enterprise-wide PBL strategy for multiple systems or Services should be pursued whenever doing so will satisfy Warfighter requirements and reduce costs.</p>
<p>Funding Mechanism</p>	
<p>Does the available funding mechanism (e.g., WCF, O&M funding) allow for a long-term performance-based arrangement?</p>	<p>The PSM IPT should determine whether a PBL is feasible under the current funding mechanism used for sustainment, or any alternative funding mechanisms that are available. In particular, the PSM IPT needs to determine whether the funding mechanism allows for funding of long-term contracts.</p> <p>Working capital-funded programs allow for long-term PBL arrangements, and working capital funds have been successfully used for PBLs in the past. If the program is not working capital-funded, the PSM IPT will need to explore the feasibility of a long-term commitment based on the applicable regulations.</p>
<p>Stakeholder Alignment and PBL Capabilities (See Section 2.2)</p>	
<p>Is the supply support strategy satisfying Warfighter requirements?</p>	<p>The team should verify whether the Warfighter requirement metrics are being met from a supply perspective. If they are not being met, the team should try to identify the percentage of non-mission capable assets due to supply shortages. This should give the team a starting point to assess opportunities to resolve these shortages through performance-based arrangements with a PSI or PSP.</p>
<p>Timing</p>	

<p>Stage in Life Cycle: Is it the right time for a change in sustainment strategy? Is there enough time remaining to benefit from the PBL business model?</p>	<p><u>Questions the team should consider:</u></p> <ul style="list-style-type: none"> • Is asset maintenance the sole responsibility of the DoD (has the asset reached its materiel sustainment date)? • In what stage of the life cycle is the asset? • How many years of remaining useful life does the system have? • How many years of remaining service life does the system have? <p>PBL works best when it can be implemented through a series of long-term contracts, allowing the product support provider enough time to recoup investments in process improvements and product modifications. Additionally, a series of long-term contracts allows the Government to recoup the realized cost savings during the renegotiation phase of each contract cycle. The Defense industry has repeatedly emphasized its preference for long-term contracts. The stable and predictable revenue streams they provide are desirable to both shareholders and capital markets. As a result, the Government is typically able to negotiate lower costs in exchange for increased contract length. Assets with longer expected service life in the inventory present the opportunity for greater savings from to PBL sustainment strategies.</p>
<p>What is the state of emerging technology?</p>	<p>The team should consider the technology base for your system in terms of potential PBL risks and benefits. The life cycle technology insertion/refreshment and the associated challenges, risks, and benefits to supportability should also be addressed, along with the risk associated with achieving performance requirements. It is also important to coordinate efforts with the Science and Technology (S&T) communities to see what may be available in the future.</p>
<p>Existing contracts: Are there any conflicting contractual arrangements?</p>	<p>The PO’s ability to pursue a PBL arrangement may be limited by existing contractual arrangements. If there is an existing long-term contract in place that will not expire by the time a PBL arrangement could be established, the PSM IPT should consider postponing the PBL effort. Otherwise, the PMO would have to terminate the existing contract in addition to negotiating a PBL arrangement.</p>
<p>Operating Environment: Is change feasible under projected OPTEMPO?</p>	<p>The PMO should analyze the current operating environment and determine whether a PBL arrangement is feasible. It may not be advisable to change the sustainment strategy and potentially give greater control to a PSP during a wartime scenario.</p>
<p>Program-Specific Considerations</p>	

Are there any program-specific barriers or opportunities?	If there are program-specific considerations that have not been addressed elsewhere, but that are deemed relevant to the analysis, these should also be evaluated. Specifically, the PSM IPT should consider whether any program-specific circumstances render a PBL more or less likely to be successful and/or easier or harder to implement.
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3.10. Appendix F: PBL Metrics

Identifying Warfighter requirements, expressed as a system-level outcome metric, is the first step toward establishing a PBL arrangement. This step is addressed in section 2.1. Most PBLs are executed at the subsystem or component level, however, so the system-level metric typically must be decomposed to lower-level metrics appropriate for the level of delegated responsibility and risk assigned to the PSI and PSP. These are the metrics that will be included in the PBL arrangement, and the outcomes of these arrangements must be linked to the overall system-level metric.

Metrics are used to track, measure, and assess the implementation and effectiveness of the performance-based logistics arrangement as executed by the PSI or PSP. Metrics are the means by which the PM and PSM gain understanding of the product support solution and identify any gaps between required and actual performance. Understanding enables adjustments to the support solution to optimize product support operations and Warfighter outcome.

Metrics should be selected or constructed to encourage performance improvement, effectiveness, efficiency, and innovation. There is no perfect metric, but selecting an appropriate complementary set of metrics will promote the desired behavior and outcome while minimizing unintended consequences. Effective metrics ensure PSI and PSP activities are aligned with the Warfighter mission, contribute to meeting Warfighter requirements, deliver an on-time, quality product, and reduce (or avoid) cost.

A best practice is to ensure the selected metrics satisfy the “SMART” test. Selected metrics should be:

S = Specific: clear and focused to avoid misinterpretation, specifying the allowable range or threshold.

M = Measurable: the unit of measure is specified and tied to underlying data to allow for meaningful statistical analysis.

A = Attainable: achievable, reasonable, cost-effective, and credible under expected Concept of Operations (CONOPS)

R = Relevant: tied to Warfighter requirements, appropriate to the PSI/PSP’s specific level of scope and responsibility, designed to motivate the right long-term behavior, and linked to appropriate incentives.

T = Timely: doable within the given time frame.

As addressed in step 2.4, the appropriate metrics are dependent on the desired outcome and the application level (system, subsystem, or component) and product support element. An example of a balanced set of metrics for subsystem or component supply support is SMA, CWT, and Perfect Order Fulfillment. This set of metrics ensures when the Warfighter requisitions a part, it is available for issue an agreed percentage of the time. If not immediately available, the part will be delivered within the agreed time frame, and that the part will be the correct part in proper working order. Together these metrics optimize supply support. MTBF could also be added to

this set of metrics. Coupled with the supply support metrics, this set of metrics improves operational performance by delivering the agreed level of operational availability/performance and minimizes the downtime waiting for the part when it does fail.

Another set of complementary metrics are MTBF, MTTR, and LRT. These three metrics ensure the component will be operational as required, can be quickly returned to service when broken and if a replacement is needed it will be delivered within the agreed time frame.

It is important to exercise caution when selecting a combination of metrics to ensure that they are not redundant or counteractive. Multiple metrics can reinforce desired behavior or create undesirable conflicts. Examples of redundant metrics are the use of Mean Time Between Removal and MTBF, as they are both aspects of material availability and measuring both will not generally improve performance. A common mistake applied to many PBL efforts is applying too many metrics. Focusing on multiple metrics, such as A_M , reliability, RTAT, and mandated inventory levels, will likely dilute the desired outcome. Providing a limited number of complementary metrics will help ensure the PSI and PSP are focusing on what is important and attainable, given their scope of responsibility.

Applying a PBL metrics hierarchy is a good way to understanding how they link and contribute to top-level performance outcomes and each other. As discussed in section 2.4.2.2, a PBL metrics hierarchy can be described as follows:

- **Level 1 metrics** are the overarching, top-level performance goal or attribute for the PBL arrangement.
- **Level 2 metrics** serve as diagnostics and support for Level 1 metrics. The diagnostic relationship helps to identify the root cause or causes of a performance gap for a Level 1 metric.
- **Level 3 metrics** serve as diagnostics and support for Level 2.

This PBL metrics hierarchy construct is similar in to the SCOR model, as applied and tailored to applicable IPS element(s) addressed in a performance-based arrangements. The primary goal of the hierarchy and decomposition is to demonstrate how metrics should “roll up” and relate to one another in a complementary manner.

A listing of metrics commonly included in PBL arrangements is provided below. Note that product support metrics may be categorized by the potential operational outcome, may be aligned with IPS elements, and may include suitability attributes captured within sustaining engineering (e.g., Reliability, MTTR).

Operational Availability and Related Metrics:

Name	Abbrev	Definition	Formula
Operational Availability	A_0	The percentage of time that a system or group of systems within a unit are operationally capable of performing an assigned mission and can be expressed as uptime/(uptime+downtime).	$A_0 = \text{Uptime} \div (\text{Uptime} + \text{Downtime})$. Also expressed as $\text{MTBM} \div (\text{MTBM} + \text{MLDT})$

Ready for Tasking	RFT	The ability of an asset to perform its assigned missions	
Sortie Generation Rate	SGR	The number of sorties flown per aircraft over a given period.	Total sorties per period divided by number of aircraft.

Materiel Availability and Related Metrics:

Name	Abbrev	Definition	Formula
Materiel Availability	A _M	The percentage of the total inventory of a system operationally capable (ready for tasking) of performing an assigned mission at a given time, based on materiel condition.	AM = Number of operationally available end items divided by the total population of end items
Non-Mission Capable Rate	NMC	The percentage of assets not mission capable.	Divide the number of non-mission capable assets by the total number of assets in the operational unit or higher organization.
Non-Mission Capable Supply	NMCS	Number (or percentage) of assets not mission capable due to missing parts.	Divide the number of assets that are non-mission capable for supply by the total number of assets in the operational unit or higher organization.
Non-Mission Capable Maintenance	NMCM	Number (or percentage) of assets not mission capable due to current maintenance (scheduled or unscheduled).	Divide the number of assets that are non-mission capable for maintenance by the total number of assets in the operational unit or higher organization.

Reliability and Related Metrics:

Name	Abbrev	Definition	Formula
Reliability	R	The probability that the system will perform without failure over a specified interval under specified conditions.	Reliability may be expressed initially as a desired failure-free interval that can be converted to a failure frequency for use as a requirement.
Mean Time Between Removal	MTBR	The average amount of time a subsystem or component remains installed before being removed for maintenance (scheduled or unscheduled).	Divide the total number of operating hours during an interval by the total number of removals. during that interval
Mean Time Between Failure	MTBF	For a particular interval, the total functional life of a population of an item divided by the total number of failures (requiring corrective maintenance actions) within the population.	Divide the total number of operating hours during an interval by the number of failures during that interval.

Mean Time Between Mission Critical Failure		For a particular interval, the total functional life of a population of an item divided by the total number of mission critical failures (requiring corrective maintenance actions) within the population.	Divide the total number of operating hours during an interval by the number of mission critical failures during that interval.
Mean Time Between System Abort	MTBSA	For a population of assets, the total operating time over an interval divided by the number of system aborts.	Divide the total number of operating hours during an interval by the number of system aborts during that interval.
Mean Time Between Operational Mission Failure		For a population of assets, the total operating time over an interval divided by the number of operational mission failures	Divide the total number of operating hours during an interval by the number of operational mission failures during that interval.
Mean Time Between Essential Function Failure	MTBEFF	For a particular interval, the total functional life of a population of an item divided by the total number of essential function failures (requiring corrective maintenance actions) within the population.	Divide the total number of operating hours during an interval by the number of essential function failures during that interval.
Mean Time Between Unscheduled Maintenance Action	MTBUM	For a population of assets, the average interval between unscheduled maintenance actions.	Divide the total number of operating hours during an interval by the number of unscheduled maintenance actions during that interval
Mean Time Between Maintenance	MTBM	A measure of reliability that represents the average time between all maintenance actions, both corrective and preventive.	Divide the total number of operating hours during an interval by the number of maintenance actions during that interval.
Mean Time Between Unit Removal/Replacement	MTBUR	<i>See: Mean Time Between Removal</i>	
Time on Wing	TOW	The number of flying hours elapsed since the last maintenance action (often expressed as average).	The number of operating hours since the last maintenance action requiring removal.
Expected Useful Life		The amount of time an asset is projected to remain in service, based on system specifications.	N/A
Mission Completion Rate	MCR	The rate at which a population of asset successfully completes its intended mission (e.g., Shoot to Kill Reliability).	Divide the number of completed missions by the total number of missions during an interval.
Mean Time Between Maintenance	MTBM	A measure of reliability that represents the average time between all maintenance actions, both corrective and preventive.	
Urgency of Need Designator	UND	Urgency of Need Designator indicates the criticality of parts when requested by maintainers	Set by policy

Mean Down Time and Related Metrics:

Name	Abbrev	Definition	Formula
Mean Down Time	MDT	The average total downtime required to restore an asset to its full operational capabilities. MDT includes the time from reporting of an asset being down to the asset being given back to operations/production to operate. MDT also includes administrative time of reporting, logistics and materials procurement and lock-out/tag-out of equipment, etc., for repair or preventive maintenance.	$MDT = \text{Mean Preventive Maintenance} + \text{Mean Corrective Maintenance} + \text{Mean Logistics Delay} / \text{total number of failures.}$
General			
Logistics Response Time	LRT	The amount of time (measured in mean days) that elapses from the date a customer establishes a requisition to the date the customer receives the material that was ordered.	N/A
Retrograde Cycle Time		The amount of time elapsed from an item failure to the return of the asset to mission capable status.	N/A
Turnaround Time	TAT	The amount of time elapsed between when an action is initiated and its completion (could apply to maintenance, repair, logistics, etc.).	$\text{Avg TAT} = \text{Sum of the elapsed times to make repairs} / \text{Number of repair jobs.}$
Logistics Delay Time	LDT	Downtime that is expended as a result of delay waiting for a resource to become available in order to perform active maintenance. A resource may be a spare part, test, maintenance equipment, skilled personnel, facility for repair, etc.	N/A
Ratio of Actual to Forecast Cycle Time		Measurement of the relationship between actual cycle time (e.g., retrograde, maintenance, repair) to forecast cycle time.	Divide average actual cycle time by average forecast cycle time.
Logistics Footprint		The Government/Contractor size or 'presence' of deployed logistics support required to deploy, sustain, and move a system. Measurable elements include inventory/equipment, personnel, facilities, transportation assets, and real estate.	N/A
Maintenance/Repair			
Mean Maintenance Time	MMT	A measure of item maintainability taking into account both preventive and corrective maintenance.	Calculated by adding the preventive and corrective maintenance time and dividing by the sum of scheduled and unscheduled maintenance events during a stated period.
Mean Time to Repair	MTTR	The total elapsed time (clock hours) for corrective maintenance divided by the total number of corrective maintenance actions during a given period.	Divide the total number of hours of corrective maintenance during a given period by the total number of corrective maintenance actions during that period.

Repair Turnaround Time	RTAT	The amount of time elapsed between when a repair is initiated and its completion.	N/A
Repair Cycle Time	RCT	Repair cycle is the elapsed time (days or hours) from the receipt of a failed item at a repair facility (at DSU, GSU, or organizational maintenance unit) until the item is ready for reissue, or the average elapsed amount of time from an item failure to the time the item failure is repaired and placed in stock or reissued.	Add Retrograde Ship Time to the maintenance echelon and the Turnaround Time at the maintenance echelon. Retrograde Ship Time is the average elapsed time from an item failure to the receipt of the item by the maintenance echelon specified to repair it. $RCT = RST + TAT$.
Maintenance Down Time		The total time during which a system/equipment is not in a condition to perform its intended function. MDT includes active maintenance time, logistics delay time and administrative delay time.	N/A
Mean Corrective Maintenance Time		<i>See: Mean Time to Repair</i>	
Maintenance Man-Hours per Operating Hour		The number of maintenance man-hours required for each system operating hour (usually expressed as average).	Divide the total number of maintenance man-hours by the total number of operating hours. Divide further by number of assets to determine maintenance man-hours per operating hour per asset.
Direct Labor Hours		The number of hours of work performed by direct labor personnel (e.g., touch labor, other directly attributable effort), measuring depot maintenance capability, workload, or capacity.	
Scrap rate		The percentage of repairable retrograde assets that cannot be repaired or restored.	Divide the number of repairable retrograde assets that must be discarded by the total number of repairable retrograde assets.
Cannibalization per Operating Hour		The number of part cannibalizations required to support each operating hour, a measure of parts availability.	Divide the total number of part cannibalizations by the total number of operating hours.

Equipment Utilization Rate		The rate at which a population of maintenance equipment is actively used (either percent of actively used equipment or percent of time that an individual piece of equipment is in use).	Divide the number of pieces of equipment actively used by the total number of pieces of equipment, or divide the number of hours/days a piece of equipment is used over the total number of hours/days in a given interval.
Depot Flow Days		The number of days elapsed between the induction of an asset into the depot and the return of the asset to inventory.	N/A
Maintenance Turnaround Time		The amount of time elapsed between when a maintenance action is initiated and its completion.	N/A
Customer Wait Time		A measurement of the total elapsed time from submission of a customer order from organizational maintenance to receipt of that order by organizational maintenance.	Monthly measurements. All times are computed as averages.
Time Definite Delivery Compliance	TDD Compliance	Computed as the percent of requisitions that meet their TDD standard over the total number of requisitions.	N/A
Maintenance Test Flight Hours		The number of test flight hours due to maintenance being flown per aircraft per month.	N/A
Supply			
Fill Rates			
Fill Rate		The percentage of ship-from-stock orders that suppliers ship within 24 hours of order receipt. For services, this metric is the proportion for services that a provider fills so they complete the service within 24 hours.	DoD currently uses availability rates for both wholesale and retail supply as comparable measures.
Perfect Order Fulfillment Rate		The percentage of time the correct product, in the requested quantity, is delivered to the customer within the time requested by the customer and is in the correct condition with the correct paperwork to allow total processing of the financial transaction	

High-Priority Fill Rate			Calculated by dividing the number of high-priority requisitions filled (01-04) within a specified time limit by the total number of high-priority requisitions submitted.
Time			
Customer Wait Time - NMCS		The time (days or hours) the system is inoperable due to delays in maintenance that are attributable to delays in obtaining parts.	
Requisition Response Time		The amount of elapsed time to release after requisition receipt based on priority.	Can be used as a target or measured as an average.
Logistics (aka Supply) Response Time	LRT/SRT	The amount of time (measured in mean days) that elapses from the time a customer establishes a requisition to the time the customer receives the material that was ordered.	
Material Requisition Cycle Time		<i>See: Logistics Response Time</i>	
Production Lead Time		The amount of time elapsed between when material is ordered from the manufacturer and when the part is delivered.	
Procurement Lead Time		The amount of time elapsed between when a demand signal for a part is received and when the part is received from the manufacturer.	
% On-Time Delivery		The percentage of deliveries that are delivered on time.	Number of on-time deliveries divided by total number of deliveries.
Supplier on Time Performance		<i>See: % On-Time Delivery</i>	
Order Fulfillment Cycle Time		<i>See: Logistics Response Time</i>	
Availability			
Supply Material Availability	SMA	A measure of the percent of time that the supply of a given repair part or spare is available.	
Stock Availability		The percentage of requisitions that is filled immediately from stock on-hand.	Stock Availability = 100 - (Backorders / Net Demands)
Efficiency			
Supply Plan Accuracy		The extent to which the available supply of repair parts or spares corresponds to the forecast stock levels for those items.	

Inventory Accuracy		The extent to which the inventory of repair parts or spares corresponds to the required stock levels for those items.	
Back Orders			
Mission-Impaired Capability Awaiting Parts	MICAP	The status of an asset that is not fully mission-capable due to a lack of one or more repair parts or spares.	The number of repair parts or spares for a given weapon system/end item that are not in stock at the time they are requisitioned.
Back Order Rate		The number of repair parts or spares for a given weapon system/end item that are not in stock at the time they are requisitioned divided by the total demands for parts.	Back Order Rate = Number of Work Orders Awaiting Parts/Total Number of Work Orders Requiring Parts
Backorder Duration Time		The average amount of time elapsed between a requisition placed for a spare not in stock to receipt of the spare part to fill the order. The Backorder Duration Time accounts for the time to receive a procurement previously ordered, and the Administrative and Production Lead Times are contributing factors to this wait time.	The status of an asset that is missing one or more repair parts or spares.
Transportation/Other Logistics			
Retrograde Ship Time	RST	The average elapsed time from an item failure to the receipt of the item by the maintenance echelon specified to repair it.	RST = Sum of elapsed times from failure to maintenance echelon/No. of retrograde incidents.
Shipping/Transit Time		The time required to transport an item (e.g., between the using unit and maintenance facility or between the manufacturer and warehouse).	
Delivery Accuracy		The extent to which the parts delivered correspond to the parts that were ordered.	One method measured as the number of inaccurate or missing parts divided by the total quantity ordered.
Percent Damaged in Transit		The number of parts damaged in transit divided by the total number of parts.	Divide the number of parts damaged in transit by the total number of parts.
Program Management			

Administrative Delay Time	ADT	That portion of maintenance downtime during which maintenance is delayed for reasons of an administrative nature (e.g., personnel assignment priority, organizational constraint, transportation delay, labor strike, etc.).	
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Information System (IS) Related Metrics:

Name	Abbrev	Definition	Formula
Net Ready	NR	Identifies operational, net-centric requirement is to ensure a new IS capability fits into the existing DoD architectures and infrastructure to the maximum extent practicable. Attributes: <ul style="list-style-type: none"> • Supports military operations • Is entered and managed on the network • Effectively exchanges information 	Compliance with Service-Oriented Architecture (SOA) technologies and policies; compliance with industry-approved open standards
IS/Business Alignment		Captures IS alignment with organization strategy and business needs. Attributes: <ul style="list-style-type: none"> • Architectural attributes - the properties that characterize the system – e.g., CPU speed or the development language • Quality attributes - modifiability, performance, availability, reliability 	Quantitative observable attributes such as Software Lines of Code (SLOC), function points
Interoperability		The condition achieved between the systems when information or services are exchanged directly and satisfactorily between the systems and/or the users. National Security System (NSS) and Information Technology System (ITS) interoperability includes both the technical exchange of information and the end-to-end operational effectiveness of that exchanged information as required for mission accomplishment. (CJCSI 3170.01G)	Analysis of integrated architectures
Usability		Measures the user experience and is generally considered a combination of effectiveness, efficiency, and satisfaction	Completion rate, task-level satisfaction, task time

<p>Maintainability</p>		<p>The ease with which changes can be made to a software system. These changes may be necessary for the correction of faults, adaptation of the system to a meet a new requirement, addition of new functionality, removal of existing functionality or corrected when errors or deficiencies occur and can be perfected, adapted, or action taken to reduce further.</p>	<p>Example factors:</p> <ul style="list-style-type: none"> • Business Requirement Complexity • Application Complexity • Data Structures Complexity • Code Complexity • Change History • Automated Documentation • Business Overview Documentation • Code Annotation • Code Size • Release Frequency
<p>Security</p>		<p>The vulnerability of an information asset in a computing environment. Can be measured by the Common Vulnerability Scoring System (CVSS) designed by NIST (National Institute of Standard and Technology). Contains six base measures:</p> <ol style="list-style-type: none"> 1. Access Vector (AV): It measures how the vulnerability is exploited, for instance, locally or remotely. The more remote an attacker can be to attack an information asset, the greater the vulnerability score. 2. Access Complexity (AC): It measures the complexity of the attack required to exploit the vulnerability once an attacker has gained access to the target system. The lower the required complexity, the higher the vulnerability score. 3. Authentication (Au): It measures the number of times an attacker must authenticate to a target in order to exploit a vulnerability. The fewer authentication instances that are required, the higher the vulnerability score. 4. Confidentiality Impact (CC): It measures the impact on confidentiality of a successfully exploited vulnerability. Increased confidentiality impact increases the vulnerability score. 5. Integrity Impact (IC): It measures the impact on integrity of a successfully exploited vulnerability. Increased integrity impact increases the vulnerability score. 6. Availability Impact (AC): It measures the impact on availability of a successfully exploited vulnerability. Increased availability impact increases the vulnerability score. 	<p>The scoring process first calculates the base metrics according to the base equation, which delivers a score ranging from 0 to 10, and creates a vector. The vector is a text string that contains the values assigned to each metric, and it is used to communicate exactly how the score for each vulnerability is derived.</p>

<p>Scalability</p>		<p>The capability of a piece of hardware or software to easily expand to meet future computing needs. Various measures of scalability include the following:</p> <ul style="list-style-type: none"> • Administrative scalability - the ability for an increasing number of organizations or users to easily share a single distributed system. • Functional scalability - The ability to enhance the system by adding new functionality at minimal effort. • Geographic scalability - The ability to maintain performance, usefulness, or usability regardless of expansion from concentration in a local area to a more distributed geographic pattern. • Load scalability - The ability for a distributed system to easily expand and contract its resource pool to accommodate heavier or lighter loads or number of inputs. Alternatively, the ease with which a system or component can be modified, added, or removed to accommodate changing load. • Generation scalability - Refers to the ability of a system to scale up by using new generations of components. • Heterogeneous scalability is the ability to use the components from different vendors. 	
<p>Portability</p>		<p>Addresses the ease with which a software system or program can be modified to operate in an execution environment other than that. for which it was specifically designed. Execution environments include operating systems, middleware, hardware, and environmental interfaces.</p>	<p>Portability is typically expressed in terms of the time required to move the software and complete data conversion and documentation updates.</p>

<p>Reusability</p>		<p>The degree to which a software module or other work product can be used in more than one computing program or software system.</p> <p>There are two types of software reuse: black box and white-box. Black box means that the code implementation is hidden from the end user by well-defined and documented interfaces, which allow the end user to use the component without needing to know how it has been implemented. White-box reuse is reuse in which the user requires access to the internal implementation of the component in order to make modifications. It is more popular with many implementers because the component can be tailored to fit the exact needs of the target system.</p> <p>The process of finding and evaluating software for reuse is similar, regardless of the mode of reuse. The key steps in the process are:</p> <ul style="list-style-type: none"> • Specifying the object to be created • Searching the project, domain, and general databases for reuse candidates • Evaluating the candidates to determine which (if any) should be used • Modifying, if necessary, to fit specific needs • Integrating the reusable component(s) • Validating the system including the new component(s) • Feeding back the knowledge regarding the payoff of reuse 	
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Ownership Cost and Related Metrics:

Name	Abbrev	Definition	Formula
Ownership Cost		Total cost of maintaining population of assets.	N/A
Cost per Unit of Operation		The total operating cost divided by the appropriate unit of measurement for a given system. Depending on the system, the measurement unit could be a flight hour, steaming hour, launch, mile driven, or other service- and system-specific metric.	The total maintenance/repair cost divided by the number of assets. The total labor costs associated with product support divided by the number of assets.
Cost per [system/subsystem/component] per [month/year]		Measure of the unit costs associated with a system/subsystem/component for a given time period.	The total operating cost divided by the number of assets, further divided by the number of units of time.
Maintenance/repair cost per unit		Used to obtain an indication of the cost of maintenance personnel for a given system. This metric may be used to compare the labor cost maintainers for a planned system with a predecessor or similar system. It may also be used to monitor the maintenance labor cost for a given	The total cost of maintainer personnel divided by the total number of operating hours.

		system at different points during its operational life to identify any changes or revise budget requirements.	
Labor Cost per Unit		Measure of the labor cost per unit of a system/subsystem/component.	The total labor costs associated with product support divided by the number of assets.
Total Value of Inventory		The total dollar value of the assets in inventory.	For each asset, multiply the number of that asset inventory by the procurement price of that asset, and then sum the total inventory value of all asset types.
Dollar Value of Stock		See: Total Value of Inventory	
O&S Cost per Operating Hour		The sum of all costs required to operate and support a system divided by the number of system operating hours. If more applicable, miles, cycles, or rounds can be substituted for hours.	Divide total operating costs by total number of operating hours.
Maintenance Cost per Operating Hour		The sum of all maintenance-related costs required to operate and support a system divided by the number of system operating hours. If more applicable, miles, cycles, or rounds can be substituted for hours.	Divide total maintenance costs by total number of operating hours.

Other Outcome Metrics:

Name	Abbrev	Definition	Formula
<i>General</i>			
Training hours delivered per year		Number of training hours delivered each year.	N/A
Number of small business contractors		Number of small business contractors providing product support for a given asset.	N/A
<i>Depot-Related</i>			
Depot direct labor hours		The number of hours of work performed by direct labor personnel including production or services labor that is assigned to a specific product, cost center, or work order.	N/A
Depot Capacity Utilization			The percentage of depot capacity being used in support of a given asset.
Number of labor hours		The total number of labor hours expended on product support for a given system.	N/A
Percent Organic Support		The proportion of the system support, usually maintenance, which is being provided organically and inversely, the proportion of the support being provided through agreements with contractors.	Divide number of organic labor hours by number of total labor hours.

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3.11. Appendix G: Calculating Weights from Pairwise Comparison Votes

	COST VS. BENEFIT		COST VS. RISK		BENEFIT VS. RISK	
Stakeholder 1		3		3		4
Stakeholder 2	4		9		3	
Stakeholder 3		2		3	2	
Stakeholder 4		2	1		2	
Result	Benefit: 3 (3+2+2-4)		Cost: 4 (9+1-3-3)		Benefit: 3 (3+2+2-4)	

The stakeholder’s votes above were summed to find the relative importance of each criterion (cost, benefit, and risk). These values are included in the table below (in blue, green, and yellow) with their inverse values (in corresponding lighter colors of blue, green, and yellow). To derive the weights used to determine the Utility Score, the cost, benefit, and risk rows were summed and the resultant values (Row Sum) were divided by the Total Matrix Sum.

	COST	BENEFIT	RISK	Row Sum	Total Matrix Sum	Weight = Row/Total
COST	1	1/3	4	5.333	13.92	38.3%
BENEFIT	3	1	3	7	13.92	50.3%
RISK	1/4	1/3	1	1.584	13.92	11.4%

These weights will be used throughout the product support analysis to determine each alternative’s Utility Score.

Cost	Benefit	Risk
38.3%	50.3%	11.4%

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3.12. Appendix H: Other Sources for Cost Estimation

Service	Resource
<p>All Services</p>	<ul style="list-style-type: none"> • “<i>Operating and Support Cost-Estimating Guide</i>,” Office of the Secretary of Defense, Cost Analysis Improvement Group (now CAPE), October 2007 <ul style="list-style-type: none"> ○ Provides overview of life cycle costs, role of O&S cost information, the O&S cost Estimating process, and the O&S Cost Element Structure • OSD Military Personnel Composite Standard Pay and Reimbursement Rates <ul style="list-style-type: none"> ○ http://comptroller.defense.gov/FinancialManagement/Reports/rates2014.aspx • Cost Estimating Community Connection Page <ul style="list-style-type: none"> ○ https://acc.dau.mil/costestimating
<p>Army</p>	<ul style="list-style-type: none"> • Operating and Support Management Information System (OSMIS) database <ul style="list-style-type: none"> ○ http://asafm.army.mil/offices/CE/Osmis.aspx?OfficeCode=1400 • The Army Military-Civilian Cost System (AMCOS) <ul style="list-style-type: none"> ○ https://www.osmisweb.army.mil/ • Force and Organization Cost Estimating System (FORCES) <ul style="list-style-type: none"> ○ http://asafm.army.mil/offices/CE/ForcesInfo.aspx?OfficeCode=1400 • Joint Integrated Analysis Tool (JIAT) Information <ul style="list-style-type: none"> ○ http://asafm.army.mil/offices/CE/Jiat.aspx?OfficeCode=1400
<p>Navy/ Marine Corps</p>	<ul style="list-style-type: none"> • Visibility and Management of O&S Costs (VAMOSOC) database and the Manpower cost Estimating Tool for Enhanced On-line Reporting (METEOR) <ul style="list-style-type: none"> ○ https://www.vamosc.navy.mil/ • Operating and Support Cost Analysis Model (OSCAM) <ul style="list-style-type: none"> ○ www.oscamtools.com • Ship-Specific <ul style="list-style-type: none"> ○ “<i>NAVSEA 05C O&S Cost Estimating Handbook</i>,” May 2010 ○ OARS 3M • Air-Specific <ul style="list-style-type: none"> ○ DECKPLATE ○ http://www.navair.navy.mil/logistics/deckplate/ ○ Cost Adjustment Visibility Tracking System (CAVTS) ○ Aircraft Inventory and Readiness Reporting System (AIRRS)
<p>Air Force</p>	<ul style="list-style-type: none"> • Air Force Total Ownership Cost (AFTOC) database <ul style="list-style-type: none"> ○ https://aftoc.hill.af.mil/ • Operating and Support Cost Analysis Model (OSCAM) <ul style="list-style-type: none"> ○ www.oscamtools.com • Logistics Installations Mission Support – Enterprise View (LIMS-EV) <ul style="list-style-type: none"> ○ AF Portal → Functional Areas: Logistics, Installations and Support (A4IS) • AFI 65-503 Cost Factors <ul style="list-style-type: none"> ○ http://static.e-publishing.af.mil/production/1/saf_fm/publication/afi65-503/afi65-503.pdf

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3.13. Appendix I: PBL Contract Example⁴¹



⁴¹ This contract is provided as an example and is not to be used a template to be followed in all cases.

PART I – THE SCHEDULE
SECTION A – SOLICITATION/CONTRACT FORM

SECTION A – SOLICITATION/CONTRACT FORM: *Includes basic information regarding the bid or proposal, including points of contact. Example:*

SOLICITATION, OFFER AND AWARD		1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 7900)		RATING	PAGE 1 OF PAGES		
2. CONTRACT NUMBER GSS456-02-C-0004		3. SOLICITATION NUMBER		4. TYPE OF SOLICITATION <input type="checkbox"/> SEALED BID (IFB) <input type="checkbox"/> NEGOTIATED (RFP)	5. DATE ISSUED		
7. ISSUED BY Generic SubSystem (GSS) Program Office 12345 Jefferson Davis Highway, Arlington, VA 22202		CODE		8. ADDRESS OFFER TO (If other than Item 7)			
NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".							
SOLICITATION							
9. Sealed offers in original and _____ copies for furnishing the supplies or services in the Schedule will be received at the place specified in item 8, or if hand carried, in the depository located in _____ until _____ (Hour) _____ local time _____ (Date)							
CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-1. All offers are subject to all terms and conditions contained in this solicitation.							
10. FOR INFORMATION CALL:		A. NAME		B. TELEPHONE (NO COLLECT CALLS) AREA CODE NUMBER EXT.			
				C. E-MAIL ADDRESS			
11. TABLE OF CONTENTS							
(X)	SEC.	DESCRIPTION	PAGE(S)	(X)	SEC.	DESCRIPTION	PAGE(S)
PART I - THE SCHEDULE				PART II - CONTRACT CLAUSES			
	A	SOLICITATION/CONTRACT FORM			I	CONTRACT CLAUSES	
	B	SUPPLIES OR SERVICES AND PRICES/COSTS		PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACH.			
	C	DESCRIPTION/SPECS./WORK STATEMENT			J	LIST OF ATTACHMENTS	
	D	PACKAGING AND MARKING		PART IV - REPRESENTATIONS AND INSTRUCTIONS			
	E	INSPECTION AND ACCEPTANCE			K	REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS	
	F	DELIVERIES OR PERFORMANCE			L	INSTRS., CONDS., AND NOTICES TO OFFERORS	
	G	CONTRACT ADMINISTRATION DATA			M	EVALUATION FACTORS FOR AWARD	
	H	SPECIAL CONTRACT REQUIREMENTS					
OFFER (Must be fully completed by offeror)							
NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.							
12. In compliance with the above, the undersigned agrees, if this offer is accepted within _____ calendar days (60 calendar days unless a different period is inserted by the offeror) from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the set opposite each item, delivered at the designated point(s), within the time specified in the schedule.							
13. DISCOUNT FOR PROMPT PAYMENT (See Section I, Clause No. 52.232-5)		10 CALENDAR DAYS (%)	20 CALENDAR DAYS (%)	30 CALENDAR DAYS (%)	CALENDAR DAYS(%)		
14. ACKNOWLEDGMENT OF AMENDMENTS (The offeror acknowledges receipt of amendments to the SOLICITATION for offers and related documents numbered and dated):		AMENDMENT NO.	DATE	AMENDMENT NO.	DATE		
15A. NAME AND ADDRESS OF OFFEROR ABC Corporation 8789 Main Street Anywhere, USA 10111		CODE	FACILITY	16. NAME AND THE TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print) ABC Corporation Contracting Officer			
15B. TELEPHONE NUMBER AREA CODE NUMBER EXT.		<input type="checkbox"/> 15C. CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE.		17. SIGNATURE		18. OFFER DATE	
AWARD (To be completed by Government)							
19. ACCEPTED AS TO ITEMS		20. AMOUNT		21. ACCOUNTING AND APPROPRIATION			
22. AUTHORITY FOR USING OTHER THAN FULL OPEN COMPETITION: <input type="checkbox"/> 10 U.S.C. 2304 (c) <input type="checkbox"/> 41 U.S.C. 253 (c)				23. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified)			
24. ADMINISTERED BY (If other than item 7)				25. PAYMENT WILL BE MADE BY _____ CODE _____			
26. NAME OF CONTRACTING OFFICER (Type or print) GSS Contracting Officer				27. UNITED STATES OF AMERICA (Signature of Contracting Officer)		28. AWARD DATE	
IMPORTANT - Award will be made on this Form, or on Standard Form 26, or by other authorized official written notice.							
AUTHORIZED FOR LOCAL REPRODUCTION Previous edition is unusable							
STANDARD FORM 33 (REV. 9-97) Prescribed by GSA - Far (48 CFR) 53.214 (c)							

PART I – THE SCHEDULE

SECTION B – SUPPLIES/SERVICES AND PRICES/COSTS

SECTION B - SUPPLIES/SERVICES AND PRICES/COSTS: *Includes Contract Line Items (CLINS) that identify the name (e.g., item number, NSN, word description), quantity, and price of supplies and/or services of effort on the contract. Example:*

<u>ITEM</u>	<u>SUPPLIES OR SERVICES</u>	<u>QTY</u>	<u>Unit</u>	<u>Unit Cost/Price</u>	<u>Total Item Amount</u>
0001	GENERIC SUBSYSTEM (GSS) COMPONENT LOGISTICS SUPPORT <i>Type Contract: Firm Fixed Price</i>	60	Mo	\$100,000.000	\$6,000,000.00
	<i>Descriptive Data: In accordance with the Performance Work Statement (PWS), the Contractor shall provide all depot-level program support.</i>				
0002	Contract Data <i>Type Contract: Firm Fixed Price</i>	1	Lo	NSP	NSP
	<i>Descriptive Data: The Contractor shall deliver data in accordance with the Contractor Data Requirements List (CDRLs – Exhibit A) attached to Section J of the contract.</i>				

1001	GENERIC SUBSYSTEM (GSS) COMPONENT LOGISTICS SUPPORT Exit Phase <i>Noun: OPTION CLIN</i> <i>Type Contract: Firm Fixed Price</i>	1	Lo		\$200,000
	<i>Descriptive Data: In accordance with the PWS, the Contractor shall ensure the transfer of performance responsibility back to the Government.</i>				
2001	POSITIVE DEMAND SURGE VARIATION GENERIC SUBSYSTEM (GSS) COMPONENT LOGISTICS SUPPORT <i>Noun: OPTION CLIN</i> <i>Type Contract: Time and Material Orders</i>	12	Mo	NTE \$30,000	NTE \$360,000
	<i>Descriptive Data: In accordance with the PWS Demand Variation Coverage process.</i>				

PART I – THE SCHEDULE
SECTION B – SUPPLIES/SERVICES AND PRICES/COSTS

<u>ITEM</u>	<u>SUPPLIES OR SERVICES</u>	<u>QTY</u>	<u>Unit</u>	<u>Unit Cost/Price</u>	<u>Total Item Amount</u>
3001	<p>EXCESS OF MAXIMUM DEMAND SURGE FOR GENERIC SUBSYSTEM (GSS) COMPONENT LOGISTICS SUPPORT</p> <p><i>Noun:</i> OPTION CLIN</p> <p><i>Type Contract:</i> Time and Material Orders</p>	TBD	Mo	\$TBD	\$TBD NTE
<p><i>Descriptive Data:</i> In accordance with the PWS Demand Variation Coverage process.</p>					

NOTICE: The following contract clauses pertinent to this section are hereby incorporated in full text:

OTHER CONTRACT CLAUSES IN FULL TEXT

B001 CONTRACT TYPE: FIRM-FIXED PRICE (FEB 1997) (TAILORED)

Total Price **\$6,000,000**

Applicable to following line item(s): 0002. *Applies to FFP CLIN(s) only.*

B002 OPTIONS (APR 2000)

The Government may require performance of the work required by CLIN(s) 1001, 2001, and 3001.

- a) The Contracting Officer shall provide written notice of intent to exercise Option 1001 to the Contractor on or before 360 days prior to period of performance, but no later than 360 days before the expiration of the contract.
- b) The Contracting Officer shall provide written notice of intent to exercise Options 2001 and/or 3001 to the Contractor 20 days prior to the estimated start of the Demand Surge period.

PART I – THE SCHEDULE

SECTION C – DESCRIPTION/SPECIFICATION/STATEMENT OF WORK

SECTION C - DESCRIPTIONS/SPECIFICATIONS/WORK STATEMENTS: *Includes the Statement of Work (SOW), Statement of Objectives (SOO), or Performance Work Statement (PWS) to amplify the requirements contained in Section B. Example*

CONTRACTOR RESPONSIBILITIES

The Contractor will be responsible for the components as identified in the contract schedule at a single price for the period of the contract. It is incumbent on the Contractor to manage the program to provide component availability and reliability, as defined by the PWS. This PWS scope will include product support integration, supply support, maintenance, sustaining engineering, and training to meet and exceed the availability and reliability performance metrics. The PWS scope will also include all necessary infrastructures, such as warehousing, handling, packaging, and information technology required to accomplish any and all tasks required to meet the performance metric. The Contractor will be responsible for accomplishing all depot-level program support set forth in this contract.

Material management functionality required includes receiving retrograde, transaction reporting, asset tracking, supply support, warehousing, and requisition processing. The Contractor must provide storage and handling capacity commensurate with the requirements associated with the storage and handling of Government-owned thermal sight systems, including personnel, equipment, insurance, and facilities required to protect assets under contract. The Government will hold title to all material stored in the Contractor's facility, including new and repair material procured for accomplishment of this contract.

During the contract, at its sole discretion, the Contractor may acquire unique consumable piece parts inventory in the possession of U.S. Government (USG) ICPs, which shall be considered Contractor-Furnished Material (CFM). Such acquisitions shall be based on the Contractor's direct arrangement with USG ICPs concerning access to, availability of, and payment for such inventory. Notwithstanding any arrangements the Contractor might have with USG ICPs, the Contractor is responsible for compliance with all contractual availability and delivery requirements.

At the end of this contract, a quantity of each repairable line item will be returned to the government in either Ready for Issue (RFI) condition or otherwise. The entire government-owned inventory of components will be returned. A portion of this inventory must be in RFI condition. The RFI quantity (calculated using formulas from contract attachments) shall be provided to the government, at no additional cost, regardless of whether the Government decides to continue with a follow-on PBL contract, return to traditional contract support, or cease support.

SUMMARY OF CONTRACTOR RESPONSIBILITIES

1. The Contractor shall meet the Availability Performance Requirement in accordance with the content contained in Section C, starting with contract award.
2. The Contractor shall be authorized to use emergency shipping by the fastest possible means on an as-required basis.

PART I – THE SCHEDULE

SECTION C – DESCRIPTION/SPECIFICATION/STATEMENT OF WORK

3. The Contractor shall perform depot-level repairs and/or overhaul, or replacement of the components covered by this agreement. The Contractor shall make the sole determination of repair or replacement decisions.
4. The Contractor shall collect data, analyze, and report actual Availability and Reliability Performance metrics to the Government.
5. The Contractor shall provide the necessary engineering support to solve technical problems associated with meeting the performance requirements of this PWS at no additional cost.
6. The Contractor shall deliver program data and reports.
7. The Contractor shall appoint a PM POC who shall jointly conduct formal Program Management Reviews.
8. The Contractor shall furnish all piece parts required to repair/overhaul the components; title will transfer to the Government Forward Operating Base (FOB) origin. All material in support of this PBL will be stored at the Contractor's facility and will remain Government property. The Contractor will not be responsible for repair, maintenance, and materials due to the premature failure of hardware not acquired from the Contractor. All quality defects in materials not acquired or procured from the Contractor resulting in premature component failures that result in additional repair generations will be subject to a mutually agreed-upon supplemental pricing adjustment.
9. The Contractor is responsible for managing obsolescence as it relates to commercial repair activity. Any issues that arise due to obsolescence will not be grounds for an equitable adjustment or relief from the metrics or delivery schedule.
10. The Contractor shall maintain an interface with the DoD's ordering system that will allow requisitions to automatically flow through DoD's system to the Contractor.
11. The Contractor shall maintain a dedicated Internet Web site accessible to appropriate contractual parties for use in data exchange and reporting of availability and reliability metrics. The Government and Contractor shall mutually agree to the level of security required for electronic access.
12. The Contractor is authorized to use scrap hardware for repair development purposes upon receipt of written approval from the Government Logistics Manager.

GOVERNMENT RESPONSIBILITIES

1. The Government shall assign a Procurement Contracting Officer (PCO) and Product Support Managers (PSM) responsible for accomplishing timely resolution of program and contract administration associated with the PBL.
2. The Government shall provide Assembly Service Records (ASR) and any and all required maintenance history records for RFI and NRFI components sent to the Contractor.
3. The Depot shall provide quality assurance personnel authorized to accomplish Government inspection/acceptance at the source of repair/replacement output under this contract.
The Government shall provide the Contractor access to all current technical publications, subsequent changes, and technical orders. If changes are made to the technical publications, or support equipment by the Government and the Contractor can demonstrate that the changes resulted in delays, the Contractor may request relief from the metrics.

PART I – THE SCHEDULE

SECTION C – DESCRIPTION/SPECIFICATION/STATEMENT OF WORK

PROGRAM MANAGEMENT

The Contractor shall provide a Program Manager (PM) who has the authority and necessary staff to accomplish the program performance requirements. The PM shall be the Contractor’s single POC to the Government for the program. Responsibilities of the Contractor’s PM include, but are not limited to:

1. The PM shall schedule and support, at a minimum, semiannual program review meetings with the PCO/PSM.
2. The PM shall coordinate program requirements and information with the PCO and WSM.
3. The PM or PM’s representatives shall be available to the Government 24x7x365.
The PM shall ensure timely resolution of business and technical problems.

PROGRAM MANAGEMENT REVIEWS

The PM, PSM, and PCO shall develop the format, frequency, and location of Program Review Boards. Program Review Boards are a forum to review Contractor performance, action items, and any other outstanding program-related items, as well as to resolve these issues. These reviews will include all relevant industry and Government stakeholders. The agenda topics covered by the PSM IPT will contain the following or mutually agreed-upon agenda items:

1. Availability status
2. Quality of product; quality of repair process utilized
3. Retrograde return
4. Open action items
5. Configuration management
6. Data and reporting access
7. Subcontracts management

PERFORMANCE REQUIREMENTS

The Contractor shall meet the performance metrics set forth below. The Contractor shall be responsible for maintaining accurate availability data in an electronic medium. Metrics are subject to Government review and verification. The following table defines the availability delivery time frame (Availability DT) requirements for requisitions based upon the Issue Group and Urgency of Need Designator.

Issue Group	Urgency of Need Designator	Delivery Time Frame to Government Shipper
1	A	2 days
2	B	3 days
3	C	10 days

PART I – THE SCHEDULE

SECTION C – DESCRIPTION/SPECIFICATION/STATEMENT OF WORK

The Availability DT for each applicable GSS Component shall be measured as follows:

Availability DT = “Date Requisition Filled” Minus “Date Requisition Received,” where:

- “Date Requisition Filled” is defined as the date upon which the requisition for repair or replacement of the component was received at the Contractor’s facility. Requisitions received any time during a 24-hour day are considered to have been received that day. A working day is defined as a Contractor normal business day, excluding Saturdays, Sundays, and Government holidays. Requisitions received on weekends or holidays are considered to have been received on the following working day. Requisitions filled on weekends or holidays are considered to have been filled on the prior working day.
- “Date Requisition Received” is defined as the date upon which the Contractor reports that a repaired or new component part has been made available to the engine/module production line.

The following are clarifying notes that are applicable to the above Availability DT formula:

1. Requisitions must include only one NSN. Requisitions will be for one unit of issue only.
2. If days elapsed are less than or equal to the above time frames, a requisition is considered to be filled on time.

METRICS REPORTING

Customer Wait Time (CWT)

The average time from requisition to receipt of items from all sources, including local retail support.

CWT Performance Requirement

The contractor must deliver requested items according to the delivery time frame listed above 85% of the time, in order to meet availability requirements. If the Contractor fails to meet the delivery requirement, the Government reserves all rights and remedies under the contract.

Mean Time Between Failure (MTBF)

Reliability is defined as the MTBF for GSS. MTBF can be calculated by dividing the total functional life of a population of an item by the total number of failures (requiring corrective maintenance actions) within the population over a particular interval.

MTBF Performance Requirement

The Contractor shall maintain a minimum MTBF metric of 900 hours. If the Contractor fails to meet this requirement, the Government reserves all rights and remedies under the contract.

PART I – THE SCHEDULE

SECTION C – DESCRIPTION/SPECIFICATION/STATEMENT OF WORK

DEMAND VARIATION COVERAGE

Demand pattern changes may impact PBL coverage via Demand Surges or Negative Demand Surges. A Demand Surge/Negative Surge is defined as follows:

Positive Demand Surge: Growth in the number of demands of all (not individual) components so that the total annual volume exceeds 105%. For example, a Demand Surge occurs during each of the three years in the following hypothetical example: Y1 = 106%, Y2 = 107%, Y3 = 108%. The Surge quantities in this example amount to 1%, 2%, and 3%, respectively.

Negative Demand Surge: Contraction in the number of demands of all components so that total volume is less than 90% of the total annual baseline demand. For example, a Negative Demand Surge occurs during each of the three years in the following hypothetical example: Y1 = 86%, Y2 = 87%, Y3 = 88%. The Negative Demand Surge quantities in this example amount to: Y1= -4%, Y2=-3%, Y3= -2%.

The value of positive and negative Demand Surge will be calculated for each year of performance under the arrangement, by comparing forecast demand with actual annual demand experienced. In the event that demand for components surges for any reason (e.g., due to operating conditions, operations tempo, or supply/maintenance chain modifications), the monetary value of positive and negative Demand Surge will be calculated by multiplying the absolute value quantity of positive or negative Demand Surge times the Price Per Demand Variation. All positive and negative Demand Surge adjustments will be liquidated at the end of each calendar year of contract performance, as soon as the actual demand data for the last month of an annual period of performance has been recorded. Positive demand surge coverage acquired will be reconciled to account for quantity of surge inducted vice surge coverage authorized.

The Contractor shall notify the PCO in writing that a Surge may occur within 45 days of the identifying a possible demand surge within a specific period of annual performance (total accumulated demand is expected to exceed 105% of the annual baseline demand). Surge amounts greater than 105% shall be included in the Availability metric calculations at 100%, regardless of whether the requisitions were in fact filled within the applicable Availability DT.

The Government may or may not elect to add additional funding to the contract for Demand Surge coverage between 105% and 110%. If the Government requires this coverage, Option 2001 will be exercised under the contract to cover a specified quantity of surge demand and a specified term of Demand Surge coverage, priced using the Price per Demand Variation. Payment for the accumulation of a positive surge is only paid if authorized by the exercise of the option. The Contractor will issue a separate surge invoice at the end of the annual period of performance citing the surge authorization option. If the PBL performance period demand has reached 105% and the Government has not ordered additional demand coverage, the Contractor has the authority to stop filling requisitions.

Negative Surge Demand adjustments will also be liquidated at the end of each annual period of performance. A credit representing the monetary value of Negative Demand Surge will be applied to the payment made in the following year after annual reconciliation.

PART I – THE SCHEDULE

SECTION C – DESCRIPTION/SPECIFICATION/STATEMENT OF WORK

In the case of the final period of contract performance, all demand surge adjustments will be liquidated under the final month of the final quarterly order via an additional Government payment or monetary refund. Furthermore, the Government and Contractor may mutually agree to adjust an annual demand forecast if necessary in the event that there are repetitive or prolonged surges during the period of contract performance. The fixed annual price related to PBL performance is not subject to renegotiation. Any change in total contract amount related to Demand Variation will be calculated using the Price per Demand Variation process. Adjustments shall apply to specific annual periods of performance only.

The forecasted baseline operational hours of the subsystem are 935 hours per year, with an expected increase of 5% each year throughout the duration of the contract. The band variation table, below, details the operational hours expected each year with bands of possible variation ranging from 90% to 110% of expected demand (considered maximum surge). All values that fall outside of the 90% to 105% range are considered surges and will be treated as surges for contractor incentive, metrics performance and payment adjustments.

CY Year	Quantity (hours)	Price per Variation	Band Minimum (90%)	Band Maximum (105%)	Maximum Surge (110%)
2014	935	\$\$	842	982	1029
2015	982	\$\$	883	1031	1080
2016	1031	\$\$	928	1082	1134
2017	1082	\$\$	974	1136	1190
2018	1136	\$\$	1022	1193	1250

The Contractor shall in no event be required to fulfill demands in excess of the Maximum Surge quantities. Should the Government require PBL support in excess of the Maximum Surge quantities, Option 3001 will be exercised under the contract to cover this surge demand. The option will detail a specified term of coverage. This option may be used at any time during the contract period of performance. Actual pricing will be agreed to between the parties prior to exercise of the option; the Price per Demand Variation process will be used as a guide. In no case shall the Government exercise Option 3001 as a UCA.

METRIC REPORTING AND INCENTIVES

The Contractor shall fill all requisitions during the contractual performance period. The Contractor will receive a premium when they exceed the 85% CWT threshold and will be penalized when they do not meet this threshold. Likewise, the PBL Contractor will be paid a premium for MTBF reliability above 900 hours and will be penalized if they do meet their target. For every evaluation period during which the Contractor maintains premium performance, they

PART I – THE SCHEDULE

SECTION C – DESCRIPTION/SPECIFICATION/STATEMENT OF WORK

will be paid as shown below (based upon the average annual metrics percentages recorded during the evaluation period). A disincentive will be applied for performance below the contract targets. The average metric performance percentages shall be rounded to the nearest whole number in order to determine the applicable premium delivery payment or disincentive.

CWT	Incentive	CWT	Disincentive
95%	+5%	80%	-3%
90%	+3%	75%	-5%
85%	---	70%	-7%

MTBF	Incentive	MTBF	Disincentive
1,500 hrs,	5%	800 hrs,	-3%
1,200 hrs,	3%	700 hrs,	-5%
900 hrs,	---	600 hrs,	-7%

CWT and MTBF Metric Performance Evaluation Periods

The first CWT and MTBF metric evaluation period begins on 01 January 2014 and ends on 31 December 2014. In GSS, the Contractor shall maintain a minimum 85% CWT metric within the time frame defined above. The results of the first evaluation period (premium delivery payment or disincentive) will be applied to the price applicable to the first period of performance. All remaining evaluation periods run concurrent with the calendar year and will establish premium delivery payment or disincentive price adjustments applicable to that year of performance. The premium delivery payments or disincentive amounts described above shall be made with the initial invoices for the following calendar year.

The table below summarizes the evaluation/application periods and invoice dates:

Evaluation/Application Period	Invoice Date
1/1/14 - 12/31/14	JAN 2015
1/1/15 - 12/31/15	JAN 2016
1/1/16 - 12/31/16	JAN 2017
1/1/17 - 12/31/17	JAN 2018
1/1/18 - 12/31/18	DEC 2018

PART I – THE SCHEDULE

SECTION C – DESCRIPTION/SPECIFICATION/STATEMENT OF WORK

*The DEC 2018 invoice shall include the premium delivery payment or disincentive applicable to the calendar year 2018 period of performance. See Section G for more information on payments.

Piece Parts Requirements

The Contractor is responsible for identification, selection, ordering, and stocking of piece parts to support all repairs or overhauls. Piece parts used in support of this program shall be manufactured in accordance with the latest revision drawings and specifications.

Analytical Condition Inspection

The Government will from time to time require complete disassembly and inspection of specific components and parts to verify wear trends and failure modes. This will be required on a total of no more than 2% of each component over the life of the contract. The Government will require additional disassembly, inspection and measurements at no additional cost to this contract. Where possible this data collection will be on a production-noninterference basis. This measurement documentation could also include required occasional dimensional and visual inspections on retired or condemned parts.

DATA AND REPORTING

The Contractor shall deliver data in accordance with Data Requirements.

CONTRACT EXIT PHASE REQUIREMENTS

Introduction

Exit Phase encompasses the procedures and corresponding time frames necessary to ensure the orderly and efficient transfer of performance responsibility back to the Government upon completion or termination of the contract, if necessary. Exit Phase commences upon the effective date of the funded option exercising the exit phase, or, in the event of termination for the Government's convenience or for default, upon the Contractor's receipt of a termination notice from the Government, whichever occurs first. During Exit Phase, the Contractor shall comply with all contract requirements and take all precautions necessary to ensure that Warfighter readiness is not adversely impacted. The Contractor and the Government shall make all reasonable efforts to minimize the duration of the Exit Phase. It is anticipated that Exit Phase will run concurrently with the end of period of performance unless otherwise provided by either the PCO or the Exit Phase PSM IPT.⁴²

Exit Phase PSM IPT

Twelve months before commencement of Exit Phase (or a time designated by the PCO in the event of default or convenience termination), the PCO shall notify the Contractor in writing of

⁴² For contract transition, it is recommended that requirements for transitioning to a new contractor be included, if the incumbent contractor does not receive the follow-on award.

PART I – THE SCHEDULE

SECTION C – DESCRIPTION/SPECIFICATION/STATEMENT OF WORK

the Government's intent to exercise the Exit Phase. The Government and the Contractor shall establish a joint Exit Phase Product Support Management Integrated Process Team (PSM IPT). The Exit Phase PSM IPT shall develop the schedule, milestones, and performance requirements for an orderly transition of the PBL Program element to Government control, to the extent not otherwise specifically covered in the contract. If the joint Exit Phase PSM IPT is unable to agree on the above, the PCO retains final approval authority and may unilaterally establish the schedule, milestones, and performance requirements for the Exit Phase.

Data Requirements for Equipment and Government-Furnished Property (GFP)

Within 30 days of the commencement of Exit Phase, as directed by the PCO, the Contractor shall provide in writing the current status and the projected status at the end of Exit Phase for the following:

- a. Quantity and condition of any Government-Furnished Property (GFP) accountable to the Contractor to be returned. This listing shall include all Government-owned and Government Right to Title special tooling and test equipment, and any other GFP and Government-Furnished Material (GFM).
- b. Quantity and identification of CFM available at the end of the contract.
- c. Listing of all piece parts required for repair and quantities used in the past 24 months.

Government-Furnished Material (GFM)/Government-Furnished Equipment (GFE)

The Contractor will deliver all GFM and all Government-Furnished Equipment (GFE) and special tooling/test equipment to the gaining repair source or other site identified by the PCO, in accordance with exit PSM IPT milestones and schedules.

Technical Data

The Contractor shall be responsible for transfer of all technical data, including a record of configuration changes made during the performance of this contract, as well as the current configuration technical data package (TDP). The TDP shall reflect all changes to equipment part numbers, and updates to engineering drawings, repair procedures, and test procedures necessary for the continued repair, spares manufacture, and support of the items covered under this contract.

Government rights in data are defined in Defense Federal Acquisition Regulation (DFAR)
Clause 252.227-7013 Rights in Technical Data- Noncommercial Items and in DFAR
Clause 252.227-7015 Rights in Technical Data- Commercial Items.

PART I – THE SCHEDULE
SECTION D – PACKAGING AND MARKING

SECTION D- PACKAGING AND MARKING: *This section provides the packaging, packing, preservation, and marking requirements, if any. This contract would include a description of the packaging and marking of the repairable assemblies. Example:*

I. NOTICE: The following contract clauses pertinent to this section are hereby incorporated in full text:

252.223-7001 HAZARD WARNING LABELS (DEC 1991)

(a) “Hazardous material,” as used in this clause, is defined in the Hazardous Material Identification and Material Safety Data clause of this contract.

(b) The Contractor shall label the item package (unit container) of any hazardous material to be delivered under this contract in accordance with the Hazard Communication Standard (29 CFR 1910.1200, et seq.). The Standard requires that the hazard warning label conform to the requirements of the standard unless the material is otherwise subject to the labelling requirements of one of the following statutes:

- (1) Federal Insecticide, Fungicide, and Rodenticide Act;
- (2) Federal Food, Drug, and Cosmetics Act;
- (3) Consumer Product Safety Act;
- (4) Federal Hazardous Substances Act; or
- (5) Federal Alcohol Administration Act

(c) The Offeror shall list which hazardous material listed in the Hazardous Material Identification and Material Safety Data clause of this contract will be labelled in accordance with one of the Acts in paragraphs (b) (1) through (5) of this clause instead of the Hazard Communication Standard. Any hazardous material not listed will be interpreted to mean that a label is required in accordance with the Hazard Communication Standard.

(d) The apparently successful Offeror agrees to submit, before award, a copy of the hazard warning label for all hazardous materials not listed in paragraph (c) of this clause. The Offeror shall submit the label with the Material Safety Data Sheet being furnished under the Hazardous Material Identification and Material Safety Data clause of this contract.

(e) The Contractor shall also comply with MIL-STD-129, Marking for Shipment and Storage (including revisions adopted during the term of this contract).

PART I – THE SCHEDULE

SECTION E – PACKAGING AND MARKING

SECTION E- INSPECTION AND ACCEPTANCE: *This section includes the location of inspection and acceptance, quality assurance and reliability requirements. In this contract we would expect to see information on the inspection/acceptance and quality of the repairable assemblies. Example:*

I. NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

A. FEDERAL ACQUISITION REGULATION CONTRACT CLAUSES

- 52.246-02 INSPECTION OF SUPPLIES -- FIXED-PRICE (AUG 1996)
- 52.246-04 INSPECTION OF SERVICES -- FIXED-PRICE (SEP 1999)
- 52.246-16 RESPONSIBILITY FOR SUPPLIES (APR 1984)

B. DEFENSE FEDERAL ACQUISITION REGULATION SUPPLEMENT CONTRACT CLAUSES

252.246-7000 MATERIAL INSPECTION AND RECEIVING REPORT (MAR 2008)

II. NOTICE: The following contract clauses pertinent to this section are hereby incorporated in full text:

OTHER CONTRACT CLAUSES IN FULL TEXT

E007 INSPECTION AND ACCEPTANCE AUTHORITY (APR 1998) (TAILORED)

Inspection and acceptance for all Contract Exhibits shall be accomplished by the COR.

INSPECTION AND ACCEPTANCE TERMS

Supplies/services will be inspected/accepted at:

<u>CLIN</u>	<u>INSPECT AT</u>	<u>INSPECT BY</u>	<u>ACCEPT AT</u>	<u>ACCEPT BY</u>
0001	Gov't facility	Government	Contractor Facility	Government
1001	Gov't facility	Government	Gov't Facility	Government
2001	Gov't facility	Government	Contractor Facility	Government
3001	Gov't facility	Government	Contractor Facility	Government

PART I – THE SCHEDULE
SECTION F – DELIVERIES OR PERFORMANCE

SECTION F- DELIVERY OR PERFORMANCE: *This section specifies the requirements for time, place, and method of delivery or performance. In this contract, we would expect to see specific delivery instructions to include transportation, title, risk of loss, and custody transfer.*

Example:

NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

FEDERAL ACQUISITION REGULATION CONTRACT CLAUSES

F-1	52.211-17	DELIVERY OF EXCESS QUANTITIES	(SEP 1989)
F-2	52.242-15	STOP-WORK ORDER	(AUG 1989)
F-3	52.242-15	STOP-WORK ORDER (AUG 1989) - ALTERNATE I	(APR 1984)
F-4	52.242-17	GOVERNMENT DELAY OF WORK	(APR 1984)
F-5	52.247-29	F.O.B. ORIGIN	(JUN 1988)
F-6	52.247-34	F.O.B. DESTINATION	(NOV 1991)

F-7 Item 0002 - The data to be furnished hereunder shall be delivered in accordance with the schedules as set forth on the applicable Exhibits, Contract Data Requirements List, and DD Form 1423.

(1) DELIVERIES OR PERFORMANCE

All supplies to be furnished hereunder shall be delivered free of expense to the Government in accordance with instructions specified in the clause hereof entitled "F.O.B. DESTINATION," at or near the Government testing facility located at:

GSS Warehouse A
Jefferson Davis Hwy
Arlington, VA 22202

The Contractor shall furnish all piece parts required to repair/overhaul the components; title will transfer to the Government FOB origin. All material in support of this PBL will be stored at the Contractor's facility and will remain Government property.

ITEM 0001 - The Contractor shall deliver all supplies and services IAW PWS by 31 Dec 2018.

ITEM 0002 - Data - The Contractor shall deliver Data in accordance with the CDRL, DD Form 1423, as attached.

PART I – THE SCHEDULE

SECTION G – CONTRACT ADMINISTRATION DATA

SECTION G - CONTRACT ADMINISTRATION: *This section includes any required accounting and appropriation data and any required contract administration information. This usually includes the names/locations of the Government Contracting Officers, Government CORs, and invoicing instructions. Example:*

I. NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

A. DEFENSE FEDERAL ACQUISITION REGULATION SUPPLEMENT CONTRACT CLAUSES IN FULL TEXT

252.232-7006 WIDE AREA WORKFLOW PAYMENT INSTRUCTIONS (MAY 2013)

II. NOTICE: The following contract clauses pertinent to this section are hereby incorporated in full text:

A. DEFENSE FEDERAL ACQUISITION REGULATION SUPPLEMENT CONTRACT CLAUSES IN FULL TEXT

252.201-7000 CONTRACTING OFFICER’S REPRESENTATIVE (DEC 1991)

(a) Definition. “Contracting officer’s representative” means an individual designated in accordance with subsection 201.602-2 of the Defense Federal Acquisition Regulation Supplement and authorized in writing by the Contracting Officer to perform specific technical or administrative functions.

(b) If the Contracting Officer designates a COR, the Contractor will receive a copy of the written designation. It will specify the extent of the COR’s authority to act on behalf of the contracting officer. The COR is not authorized to make any commitments or changes that will affect price, quality, quantity, delivery, or any other term or condition of the contract.

INVOICING

Base invoice amounts, without the disincentive factor applied, for each calendar year of performance are included below for a \$6 million FFP contract with period of performance of five years.

PART I – THE SCHEDULE
SECTION G – CONTRACT ADMINISTRATION DATA

CY Year	Monthly Payment	Number of Months	Total
2014	\$100,000	12	\$1,200,000
2015	\$100,000	12	\$1,200,000
2016	\$100,000	12	\$1,200,000
2017	\$100,000	12	\$1,200,000
2018	\$100,000	12	\$1,200,000
Total 2014-2018			\$6,000,000

The first payment of each calendar year, 2015, 2016, 2017, 2018, and the final payment at the end of the contract period of performance will be used to apply the incentive/disincentive factor for the CWT and MTBF Metrics Clause and the Demand Variation Clause, in accordance with the PWS and Option CLIN 0002 exercise. The contractor will invoice for Option CLIN 0001 at end of contractor period of performance.

PART I – THE SCHEDULE
SECTION H – SPECIAL CONTRACT REQUIREMENTS

SECTION H - SPECIAL CONTRACT REQUIREMENTS: *Section H contains any special provisions, terms, and conditions not included in Section I, Contract Clauses. Section H can contain clauses that are written specifically for the procurement. Example:*

NOTICE: The following contract clauses pertinent to this section are hereby incorporated in full text.

OTHER CONTRACT CLAUSES IN FULL TEXT

OPTIONS (MAY 1997) (TAILORED)

The Government reserves the right to exercise the following option(s) subject to the stated conditions. In the event an option is exercised, the affected sections of the contract, e.g., Section B, Section F, Section G, etc., will be modified as appropriate.

GOVERNMENT-FURNISHED PROPERTY (GFP) (FEB 2003)

Pursuant to the Government Property clause herein, the Government shall furnish the item(s) of property listed below as GFP to the Contractor, FOB. See Attachment 2 – GFE List, for use in performance of this contract. Upon completion of the contract, the Contractor shall obtain disposition instructions from the Government Property Administrator of the activity having responsibility for administration of the contract.

ITEM NR	NSN	NOUN PART NO	QTY	DELIVERY DATE
See Attachment 2 - GFE List				

EXCLUSION FOR SIGNIFICANT CHANGES TO PUBLICATIONS, MANUALS, AND STANDARDS

All components will be inspected, repaired and tested to the version of the maintenance documents set forth in the paragraph below that were applicable as of the date upon which this PBL contract was signed. The Contractor will submit a proposal for any Significant Changes caused by a government initiated Maintenance Baseline Document change and, upon mutual agreement by the parties, the Contractor shall be entitled to a contractual price adjustment.

Significant Change is defined as a change to listed Maintenance Baseline Documents that is estimated to result in an additional price to the Contractor (with the value of such change being estimated for the remaining period of performance of the contract), representing the price associated with anticipated increases in per unit repair or replacement costs resulting from Government-mandated engineering, configuration, or repair process changes. Note: This clause is independent of the “Demand Variation Coverage.”

IMPLIED WARRANTY

Implied warranties of merchant ability and fitness for a particular purpose, and all other implied warranties, are excluded from this transaction and shall not apply to the goods sold or any

PART I – THE SCHEDULE
SECTION H – SPECIAL CONTRACT REQUIREMENTS

performance hereunder. All other warranties, whether written, statutory, or oral, are also excluded from this transaction and shall not apply to the goods sold or any performance hereunder.

INVENTORY CUSTODY

The contractor is required to maintain, secure, account for and report the status of the inventory daily. The property must also be recorded in a Government Accountable Property System of Record. Interim DoDI 5000.02 states that a Program Manager will develop and implement a product support strategy that addresses “the government accountable property system, [which] documents all government-owned property, whether it is held and managed by the government, contractor, or third party, in accordance with 40 U.S.C. 524.”

GOVERNMENT RETROGRADE RETURN METRIC

The Government will be responsible for the packaging and transportation of retrograde assets to sites identified in the Master Repairable Item List (MRIL). The Government’s NRFI return time for items weighing less than 150 pounds is an average 40 days from delivery of an RFI asset and an average 44 days for items weighing at least 150 pounds.

Should these average times be exceeded for an item during any contract year, then the item may be excluded from the CWT metric calculation if the Contractor can demonstrate that:

1. Ability to meet the CWT metric has been adversely affected by an item’s NRFI return time exceeding averages during any 90-day period
2. Carcass returns have been insufficient to support program requirements for an item to the Government’s satisfaction that this deviation has negatively impacted the Contractor’s ability to meet CWT requirement

SURGE/DEMAND VARIATION COVERAGE

The Contractor shall satisfy surge requirements between 100% and 105% of forecasted baseline. Surge requirements exceeding 105% of forecasted baseline will be authorized by the exercise of Option 0002. See Sections C and G for more explanation of the incentive, metrics, and payment adjustments.

GOVERNMENT INVENTORY

The levels of inventory required to meet the performance metrics of this contract will be the sole responsibility of the Contractor for the contract term. It will be at their discretion whether a requisition will be filled using a new part or repair of an “F” condition carcass or an “A” condition asset. The Contractor will be expected to maximize use of on-hand items before procuring the same parts for this performance-based logistics support contract. This adherence is in accordance with the Office of the Assistant Secretary of Defense Memorandum dated December 20, 2010, Maximum Utilization of Government-Owned Inventory in Performance-Based Logistics Arrangements.

PART I – THE SCHEDULE
SECTION H – SPECIAL CONTRACT REQUIREMENTS

CONFIGURATION CONTROL

The Contractor may develop, prepare, submit, and incorporate configuration changes for approval by the Government in order to improve the reliability, availability, and maintainability of the covered equipment.

PART II – CONTRACT CLAUSES
SECTION I – CONTRACT CLAUSES

SECTION I - GENERAL PROVISIONS: *This contract section includes clauses required by law or regulation and additional approved clauses that are not included in any other section of the contract. The clauses included in Section I are dependent upon the contract type, its supply/service/construction distinction and commerciality.* **Example:**

I. NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

A. FEDERAL ACQUISITION REGULATION CONTRACT CLAUSES

52.202-01	DEFINITIONS	(JUL 2004)
52.203-03	GRATUITIES	(APR 1984)
52.203-05	COVENANT AGAINST CONTINGENT FEES	(APR 1984)
52.203-06	RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT (SEP 2006)	
52.203-07	ANTI-KICKBACK PROCEDURES	(OCT 2010)
52.203-08	CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY	(JAN 1997)
52.203-10	PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY	(JAN 1997)
52.203-12	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS	(OCT 2010)
52.203-13	CONTRACTOR CODE OF BUSINESS ETHICS AND CONDUCT	(APR 2010)
52.204-04	PRINTED OR COPIED DOUBLE-SIDED ON RECYCLED PAPER	(AUG 2000)
52.204-07	CENTRAL CONTRACTOR REGISTRATION	(APR 2008)
52.204-09	PERSONAL IDENTITY VERIFICATION OF CONTRACTOR PERSONNEL	(SEP 2007)
52.204-10	REPORTING EXECUTIVE COMPENSATION AND FIRST-TIER SUBCONTRACT AWARDS	(JUL 2010)
52.209-06	PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT	(DEC 2010)

**B. DEFENSE FEDERAL ACQUISITION REGULATION SUPPLEMENT CONTRACT
CLAUSES**

252.201-7000	CONTRACTING OFFICER'S REPRESENTATIVE	(DEC 1991)
252.203-7000	REQUIREMENTS RELATING TO COMPENSATION OF FORMER DOD OFFICIALS	(JAN 2009)
252.203-7001	PROHIBITION ON PERSONS CONVICTED OF FRAUD OR OTHER DEFENSE CONTRACT-RELATED FELONIES	(DEC 2008)
252.225-7012	PREFERENCE FOR CERTAIN DOMESTIC COMMODITIES	(JUN 2010)
252.225-7016	RESTRICTION ON ACQUISITION OF BALL AND ROLLER BEARINGS	(DEC 2010)
252.226-7001	UTILIZATION OF INDIAN ORGANIZATIONS, INDIAN-OWNED ECONOMIC ENTERPRISES, AND NATIVE HAWAIIAN SMALL BUSINESS CONCERNS	(SEP 2004)
252.227-7013	RIGHTS IN TECHNICAL DATA--NONCOMMERCIAL ITEMS	(NOV 1995)

PART II – CONTRACT CLAUSES
SECTION I – CONTRACT CLAUSES

252.227-7014	RIGHTS IN NONCOMMERCIAL COMPUTER SOFTWARE AND NONCOMMERCIAL COMPUTER SOFTWARE DOCUMENTATION (JUN 1995)
252.227-7016	RIGHTS IN BID OR PROPOSAL INFORMATION (JAN 2011)
252.227-7019	VALIDATION OF ASSERTED RESTRICTIONS--COMPUTER SOFTWARE (JUN 1995)
252.227-7030	TECHNICAL DATA--WITHHOLDING OF PAYMENT (MAR 2000)
252.227-7037	VALIDATION OF RESTRICTIVE MARKINGS ON TECHNICAL DATA (SEP 1999)
252.232-7003	ELECTRONIC SUBMISSION OF PAYMENT REQUESTS AND RECEIVING REPORTS (MAR 2008)
252.235-7004	PROTECTION OF HUMAN SUBJECTS (JUL 2009)
252.237-7010	PROHIBITION ON INTERROGATION OF DETAINEES BY CONTRACTOR PERSONNEL (NOV 2010)
252.242-7004	MATERIAL MANAGEMENT AND ACCOUNTING SYSTEM(JUL 2009) <i>Applies to Firm-Fixed-Price CLIN(s) only.</i>
252.243-7001	PRICING OF CONTRACT MODIFICATIONS (DEC 1991) <i>Applies to Firm-Fixed-Price CLIN(s) only.</i>
252.243-7002	REQUESTS FOR EQUITABLE ADJUSTMENT (MAR 1998)
252.244-7000	SUBCONTRACTS FOR COMMERCIAL ITEMS AND COMMERCIAL COMPONENTS (DOD CONTRACTS) (NOV 2010)
252.247-7023	TRANSPORTATION OF SUPPLIES BY SEA (MAY 2002)

II. NOTICE: The following contract clauses pertinent to this section are hereby incorporated in full text.

A. FEDERAL ACQUISITION REGULATION CONTRACT CLAUSES IN FULL TEXT

52.211-15 DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (APR 2008)

This is a rated order certified for national defense, emergency preparedness, and energy program use, and the Contractor shall follow all the requirements of the Defense Priorities and Allocations System regulation (15 CFR 700).

52.252-02 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es): <http://farsite.hill.af.mil/>.

52.252-06 AUTHORIZED DEVIATIONS IN CLAUSES (APR 1984)

(a) The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of “(DEVIATION)” after the date of the clause.

PART II – CONTRACT CLAUSES
SECTION I – CONTRACT CLAUSES

(b) The use in this solicitation or contract of any Defense Federal Acquisition Regulation Supplement (48 CFR Chapter 2) clause with an authorized deviation is indicated by the addition of “(DEVIATION)” after the name of the regulation.

**DEFENSE FEDERAL ACQUISITION REGULATION SUPPLEMENT CONTRACT
CLAUSES IN FULL TEXT**

252.223-7008 PROHIBITION OF HEXAVALENT CHROMIUM (MAY 2011)

(a) *Definitions.* As used in this clause—

“Homogeneous material” means a material that cannot be mechanically disjointed into different materials and is of uniform composition throughout.

(1) Examples of homogeneous materials include individual types of plastics, ceramics, glass, metals, alloys, paper, board, resins, and surface coatings.

(2) Homogeneous material does not include conversion coatings that chemically modify the substrate.

“Mechanically disjointed” means that the materials can, in principle, be separated by mechanical actions such as unscrewing, cutting, crushing, grinding, and abrasive processes.

(b) *Prohibition.*

(1) Unless otherwise specified by the Contracting Officer, the Contractor shall not provide any deliverable or construction material under this contract that—

(i) Contains hexavalent chromium in a concentration greater than 0.1 percent by weight in any homogenous material; or

(ii) Requires the removal or reapplication of hexavalent chromium materials during subsequent sustainment phases of the deliverable or construction material.

(2) This prohibition does not apply to hexavalent chromium produced as a by-product of manufacturing processes.

(c) If authorization for incorporation of hexavalent chromium in a deliverable or construction material is required, the Contractor shall submit a request to the Contracting Officer.

(d) *Subcontracts.* The Contractor shall include the substance of this clause, including this paragraph (d), in all subcontracts, including subcontracts for commercial items that are for supplies, maintenance, and repair services, or construction materials.

PART III – LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS
SECTION J – LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

SECTION J- LIST OF ATTACHMENTS: *This contract section is a list of attachments to the contract. Frequently, the PWS or specification is attached to the contract and referenced in Section C. The Contracting Officer will list the title, date, and number of pages for each attached document, exhibit, or attachment. Example:*

DOCUMENT	PGS	DATE	TITLE
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EXHIBIT A	XX	09 MAR 20XX,	CONTRACT DATA REQUIREMENTS LISTS CDRLS)
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As an example only: The following is a list of additional common attachments you may find in a contract or Task/Delivery Order:

ATTACHMENT 1	N/A	01 OCT 2002	DD FORM 254 CONTRACT SECURITY CLASSIFICATION SPECIFICATION
ATTACHMENT 2	N/A	01 OCT 2002	GOVERNMENT-FURNISHED PROPERTY (GFP)
ATTACHMENT 3	N/A	01 JAN 2014	READY FOR ISSUE FORMULAS

PART IV – REPRESENTATIONS AND INSTRUCTIONS

SECTION K – REPRESENTATIONS, CERTIFICATIONS, OTHER STATEMENTS OF OFFEROR

SECTION K - REPRESENTATIONS, CERTIFICATIONS, AND OTHER

STATEMENTS OF OFFEROR: *The Contractor's representations and certifications, such as whether they are a small business, are incorporated by reference only. Therefore, you will only see this section in the RFP, not in the contract.*

PART IV – REPRESENTATIONS AND INSTRUCTIONS

SECTION L – INSTRUCTIONS TO OFFERORS

SECTION L - INSTRUCTIONS, CONDITIONS, AND NOTICES TO OFFERORS

Note: Contractor Sections L and M are used only during source selection. They are not part of the contract. The PSM must be actively involved in source selection from the start of the program through sustainment, ensuring logistics factors are considered when selecting the winning Contractor.

I. GENERAL

Offerors are required to submit a single proposal composed of three separate parts as follows:

Part I – Technical Proposal - Original and four copies to include all data and information required for evaluation, and exclude any reference to the pricing aspects of the offer.

Part II - Past Performance Proposal - Original and four copies to include all data and information required for evaluation, and exclude any reference to the pricing aspects of the offer.

Part III - Price Proposal – Original and four copies to include all data and information required for evaluation.

II. PROPOSAL CONTENT

Part I - Technical Proposal - It is incumbent on the Contractor to manage the program to provide component availability and reliability as described in the PWS. This PWS scope will include product support integration, supply support, maintenance, sustaining engineering, and training to meet and exceed the availability and reliability performance metrics. The PWS scope will also include all necessary infrastructures such as warehousing, handling, packaging, and information technology required in order to accomplish any and all tasks required to meet the performance metric. The contractor will be responsible for accomplishing all depot-level program support set forth in this contract. This technical proposal will articulate how the Contractor will accomplish the requirements in the PWS.

Part II - Past Performance - The Offeror shall describe its past performance on directly related or similar contracts it has held within the last three (3) years, which are of similar scope, magnitude, and complexity to that which is detailed in the RFP. The Offerors that describe similar contracts shall provide a detailed explanation demonstrating the similarity of the contracts to the requirements of the RFP. The Offeror shall provide the following information regarding its past performance:

- a) Contract number(s)
- b) Name and reference point of contact at the federal, state, or local government, or commercial entity for which the contract was performed
- c) Dollar value of the contract
- d) Detailed description of the work performed,
- e) Names of subcontractor(s) used, if any, and a description of the extent of work performed by the subcontract(s),

PART IV – REPRESENTATIONS AND INSTRUCTIONS

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- f) The number, type, and severity of any quality, delivery, or cost problems in performing the contract, the corrective action taken, and the effectiveness of the corrective action.
- g) For the contracts identified in response to (a.) above, provide the following information:
 - 1. The actions, techniques, and methods used to identify and minimize risk in performance of the requirements of the SOW; and
 - 2. The actual success of the actions, techniques, and methods used in mitigating risks.

Part III - Price Proposal – Fill in all prices/costs in the solicitation document.

SECTION M - EVALUATION FACTORS FOR AWARD

Note: Contract Sections L and M are used only during the source selection. They are not part of the contract. The PSM must be actively involved in source selection from the start of the program through sustainment, ensuring logistics factors are considered when selecting the winning Contractor.

EVALUATION CRITERIA AND BASIS FOR AWARD

The Government intends to make a single award to the eligible, responsible, and technically acceptable Offeror whose offer, conforming to the solicitations, is determined most advantageous to the Government, price and past performance considered. The Offeror's proposal shall be in the form prescribed by, and shall contain a response to, each of the areas identified in the Section L solicitation provision entitled "Submission of Proposals." Only those proposals prepared in accordance with the solicitation will be evaluated. The evaluation will consider technical and past performance as equally important and when combined are approximately equal to cost or price. The Government reserves the right to award the contract to other than the lowest-priced offer.

TECHNICAL

The Government will evaluate the Contractor's ability to provide component availability and reliability as described in the PWS. This includes the Contractor's ability to provide product support integration, supply support, maintenance, sustaining engineering, and training to meet and exceed the availability and reliability performance metrics. The Government will also evaluate the Contractor's plan to provide all necessary infrastructures such as warehousing, handling, packaging, and information technology required in order to accomplish any and all depot-level program support tasks required to meet the performance metrics set forth in this contract.

PAST PERFORMANCE

The Government will evaluate the quality of the Offeror's past performance. This evaluation is separate and distinct from the Contracting Officer's responsibility determination. The assessment of the Offeror's past performance will be used as a means of evaluating the relative capability of the Offeror and other competitors to successfully meet the requirements of the RFP.

The Government reserves the right to obtain information for use in the evaluation of past performance from any and all sources, including sources outside of the Government. Offerors lacking relevant past performance history will receive a neutral rating for past performance. However, the proposal of an Offeror with no relevant past performance history, while rated neutral in past performance, may not represent the most advantageous proposal to the Government, and thus, may be an unsuccessful proposal when compared to the proposals of other Offerors. The Offeror must provide the information requested in the provision entitled "Submission of Proposals" in Section L for past performance evaluation, or affirmatively state that it possesses no relevant directly related or similar to past performance. An Offeror failing to provide the past performance information, or to assert that it has no relevant directly related or similar past performance, will be considered ineligible for award.

The Government, in addition to other information received, may utilize the Red/Yellow/Green (RYG) to evaluate past performance. The RYG Program accumulates data on suppliers by Federal Supply Class (FSC). The Government will consider RYG Program data for the FSCs of all items included in this procurement. The RYG Program classifications are summarized as follows:

- Green = Low Risk
- Yellow = Moderate Risk
- Red = High Risk
- Neutral = No Risk Established

PRICE

Price will be evaluated for affordability and reasonableness.

Price Factor

The Price Factor will not receive a color rating. The Government will evaluate each Offeror's price proposal using one or more of the techniques described in FAR 15.404. Information in the proposal and information from other sources, such as DCAA, DCMA, and information obtained by the past performance evaluation team, may be considered under the cost factor. Price analysis is the process of evaluating a proposed price without evaluating its separate cost elements and fee or profit.

Affordability

An affordable proposal does not force DAU to make unacceptable budget trade-offs. Any unaffordable proposal, including an otherwise superior proposal, may be eliminated from consideration for contract award by the SSA.

Reasonableness

Price reasonableness determination will be made in accordance with FAR 15.404-1(b), *Price analysis*.

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3.14. Appendix J: Pre-Implementation Considerations for a Sub-System PSM

A PBL sustainment arrangement for a sub-system weapons program, requires the PSM team to identify and address both organizational and program specific issues prior to the beginning the development effort which will lead to a PBL strategy. The careful analysis of the organizational dynamics will increase the likelihood of success throughout the 12-step PBL implementation process. This Appendix provides the PSM team with Pre-Implementation considerations for a Sub-System, and may be referenced and utilized throughout the development and implementation of the PBL sustainment strategy. It is designed to assist in the analysis of a Program’s organizational and operational environment, identification of potential challenges and determination of actions to help reduce the impact of these challenges. Common issues involved in defining and developing a weapon sub-system sustainment strategy will be addressed through the application of lessons learned from existing PBL arrangements. This Appendix will compare and contrast best practices and lessons learned from historical PBL sub-system implementations and provide a PSM or sustainment team with steps to address these challenges prior to the development of a sub-system sustainment strategy.



Figure 1: Pre-Implementation

Evaluate the Perspective of the Sub-System PM and PSM

Evaluating a PM and PSM’s perspective may seem like an unnecessary step in the process of developing an outcome based sustainment strategy but, as PBL implementations are both organizationally and technically complex, it is critical for the PSM to properly baseline the environment in which the sustainment team will be operating. An important element of the sub-system PSM’s baseline review is the identification of program office stakeholders who will be directly involved in various aspects of strategy development. Gaining stakeholder support early in the development process will increase awareness of various factors that can influence sustainment decisions.

It is important for the PSM to completely understand the boundaries of the position and identify their spheres of influence within the organization. The PSM role, authorized by statute, may provide the assigned individual the opportunity to view the sub-system sustainment process from a number of vantage points, each providing a slightly different view of the process. It is important for the PSM to understand how the position they hold impacts their perspective, and

how that perspective might change if they held a different vantage point. Evaluating PSM roles allows the PSM and the sustainment team to focus on areas directly impacting Warfighter relevant requirements of the sub-system.

In addition to characteristics dictated by the vantage point of the PSM, it is important for the PSM to evaluate other biases that may influence the PBL process. Since it is natural for individuals and organizations to have biases, it is imperative for a PSM to work with program stakeholders throughout the development of a sustainment arrangement to reduce process impediments and build consensus on the PBL strategy. Listed below are some specific areas to consider when evaluating possible prejudices. The list below is not intended to be all-inclusive; however, its intent is to spark critical thinking within the team, allowing the PSM to identify possible biases that may adversely influence reaching an optimal sustainment solution.

- Do you have a vested interest in one specific outcome being evaluated?
- Do you have a preference on where the work is performed for the sub-system?
- Do you have a preference on the provider that performs the work?
- How do you weight the importance of Benefits vs. Risks vs. Costs?
- Does your background lead you to prefer a certain solution set (engineer, logistics manager, maintenance manager, pilot, etc.)?

The key to understanding bias is not only to identify that you have one, but to identify why you have one.

Lastly, as a sub-system PSM there is a requirement to adjust the sustainment strategy as funding and operational priorities change. It is particularly important in the execution of a PBL as the performance based nature of the arrangement requires management in execution. The PSM must carefully consider the ongoing responsibility to support warfighter requirements. Lateral considerations must be taken into account to understand the impact of potential courses of action on other platforms and their PSMs. Downstream, the PSM must be aware of how decisions may affect the current maintenance process. Complete situational awareness of the sub-system's environment will provide deeper insights into the potential impacts (both positive and negative) a PBL strategy might have on program cost and warfighter readiness. Regardless of the sub-system sustainment strategy decision, the PSM should continue to prioritize warfighter requirements.

Program 1: Best Practices	Program 2: Lessons Learned
<ul style="list-style-type: none"> • The PSM focused on chasing the Best Value Alternative, concentrating on a holistic approach accounting for cost efficacy, benefits to warfighter and risks to the Service, specifically when evaluating courses of action during the PSVA process • The PSM identified and was aware of the extent of their influence in the sustainment of the global platform • The PSM understood the importance of, and established strong ties with the supporting functions and maintained good social acumen 	<ul style="list-style-type: none"> • The PSM did not have a strong understanding of the political realities around changing the sustainment approach (i.e. impact to other organizations and their responsibilities) • Overall lack of understanding of the PBL business model and how it could be used to affect the various aspects of the weapon system’s sustainment. • The PSM did not adequately consider their own level of decision authority as it relates to the weapon system’s sustainment strategy, impacting influence when determining a support method in step 7 of the PBL process.

Understand Organizational Dynamics of a Sub-System program

The personal prejudices and biases of the PSM address one level of environmental context. Another element required to gain situational awareness for a sub-system sustainment strategy is the evaluation of the external environment and influential factors that may affect a sub-system’s sustainment strategy.

The first step to evaluating the external environment in which a PSM may be operating is to understand the culture of an organization. Organizational culture is the climate of shared assumptions, values, and beliefs, which governs how people behave in organizations. These shared values have a strong influence on the people in the organization and dictate how they perform their jobs.⁴³ While there is no preset method to identify the culture of a particular organization, there are elements that can be observed to gather better insights. The following questions can be used to examine specific organizational dynamics:

- Does your organization foster a creative/innovative environment?
- Are their demographic trends within the workforce?
- Is their greater emphasis on team vs. individual success?
- What is the style of communication from management?

⁴³ <http://study.com/academy/lesson/what-is-organizational-culture-definition-characteristics.html>

These insights will provide context to how the organization will be inclined to perceive this process based on the established value system.

After analyzing the culture of the organizations involved, the PSM should begin to identify various stakeholders required to develop the sub-system PBL arrangement, and where possible, define specific context for each participant. Similar to analyzing the vantage point and biases of the PSM, it is critical to identify and understand these elements for other individual stakeholders. Understanding these objectives, backgrounds and perspectives will enable the PSM to address the needs, desires and concerns of specific stakeholders, where necessary providing the PSM with proper foresight to mitigate concerns early on in the PBL implementation process.

In addition to evaluating the PBL knowledge and insight of program stakeholders, it is important for the PSM to gain as much understanding as possible of the relevant warfighter requirements and program leadership. A successful implementation for a sub-system program depends on developing advocates at all levels and challenging dissent by addressing issues with PBL facts. Creating awareness of these dynamics early on will help the PSM guide the effort through the implementation process. Organizational advocacy will prove to be especially useful when generating courses of action, evaluating the alternatives and determining the support method as outlined in steps 5, 6 and 7 of the PBL guidebook.

Program 1: Best Practices	Program 2: Lessons Learned
<ul style="list-style-type: none"> • Good understanding of the spheres of influence, recognizing how all stakeholders' organizations relied on each other • The PSM understood the importance of the right external functions, as well as the importance of the right resources within each function when engaging support, this was especially true when forming the PSM IPT in Step 2 of the PBL implementation process • Established a good cultural balance of old and new (legacy program people, new individuals with innovative approaches) • Emphasis on success for the team and program 	<ul style="list-style-type: none"> • There was a weak understanding of the spheres of influence of the different stakeholders, resulting in a failure to identify organizational boundaries • Limited capability assessment of the specific personnel supporting from each function • No true assessment of the entrenched ideologies and business nature of the organization (i.e. set in their ways) • Limited recognition of the true operational owner for the new strategy (i.e. function responsible for carrying out the approach) when identifying the Warfighter Requirements.

Identify Risks

It is important for the PSM to evaluate stakeholder positions and perspectives on PBL and develop a risk matrix reflecting both biases and weaknesses of the sustainment team.

Additionally, the PSM should document the dynamics and perspectives of the rest of the sub-system's organization and its stakeholders. The insights generated during this analysis will help the PSM identify potential risks that may develop into challenges throughout the process. When evaluating and identifying risks, it may be helpful to group those identified into two major categories, Organizational Risks and Operational Risks.

Organizational risks, as used in this section, refer to risks that derive from the analysis of the PSM staff and various organizational stakeholders. The PSM should review the personal biases and vantage point previously defined to understand where and how this perspective may cause certain influence throughout the process. For example, if the PSM has self-identified that cost is not an element viewed with high importance in determining a support arrangement, this could pose as a risk if one of the main objectives is to reduce cost. The PSM should also identify areas of influence by reviewing the findings associated with the organizational culture and the dynamics of the stakeholders. For example, if during the PSM's review of stakeholders it is determined that one of the individuals has spent 15 years working in the depot that is currently in charge of the sub-system's maintenance work, this individual's background may cause bias to impact their decisions and actions. When identifying organizational risks the PSM's goal is to understand where characteristics of the organizational environment and perspectives of the stakeholders will cause influence to the process, and how this influence may impact the overall sustainment strategy of the sub-system. The questions below are provided to sample the types of risks the PSM should be looking to identify:

- Do I have enough stakeholders involved? Are those involved the right ones?
- Are their specific biases/perspectives to be aware of throughout the process? Which stakeholders have these?
- Does the current cultural environment of this sub-systems program enable this type of change?
- Who are the people in this process that have the ability to block this effort?

While organizational risks have characteristics that are linked to cultural values and stakeholder beliefs, operational risks requires the PSM and their team to focus on various product support elements and how they impact the sustainment strategy of the particular weapon sub-system.

- Can the necessary financial resources be secured?
- When does a contract need to be in place to avoid a gap in sustainment coverage?
- How does operational-tempo impact the sustainment approach?
- Are their potential impacts to the effort dictated by the lifecycle stage?

While this phase generates awareness around specific issues that may present themselves throughout the process, it is important to understand that not all risks will develop fully into challenges to the program. In this regard, in addition to identifying specific organizational and operational risks, the PSM should consider the probability of such risks and their potential impacts.

Program 1: Best Practices	Program 2: Lessons Learned
<ul style="list-style-type: none"> • The PSM had a good understanding of the bandwidth of the individuals and organization, with respect to performing the implementation • Identified the need for sensitivity when dealing with the various PSP’s involved, avoiding disruption to the current business relationships, particularly when evaluating Courses of Action. • The PSM recognized that the organization overall was leaning towards an environment apt for change, understanding however that some reluctance would be displayed by certain stakeholders. Socialization efforts during the Product Support Value Analysis helped build the necessary organizational buy 	<ul style="list-style-type: none"> • Major issues around the optics of changing the sustainment arrangement • Specific stakeholders showed major reluctance to pursuing a PBL, expressing disbelief in the potential value and benefits • The cultural environment overall was not ready for this type of change to their sustainment strategy • When developing and reviewing courses of action, the PSM inappropriately engaged the PSP from different functions within the organization, expressing different sustainment intentions • Lack of leadership and change management skills led to uncertainty regarding the strategic direction

Implement Actions to Mitigate Identified Risks

The key to mitigating sub-system sustainment strategy risks is to gain a strong understanding of what is behind each risk identified. This understanding will enable the PSM to determine and implement actions that will increase the probability of success throughout the process. When developing actions to safeguard against risks identified, Figure 2 can be used for guidance as a framework.

Overall, the PSM’s objective is to implement the best sustainment strategy in an affordable manner that supports warfighter requirements. The process outlined throughout this Appendix, in conjunction with the 12-step implementation



Figure 2: Risk Mitigation

process, is designed to help the PSM analyze the organizational and operational environment, identify potential challenges and determine actions to help reduce the impact of such challenges, in order to support this objective.

Program 1: Best Practices	Program 2: Lessons Learned
<ul style="list-style-type: none"> • The implementation throughout the 12 steps was paced appropriately, setting the correct expectations at the appropriate times • When evaluating industry partners as potential PSIs/PSPs, a frank dialogue was opened to help foster a partnership that was mutually beneficial, while maintaining a shared risk environment • The PSM established a methodical approach, keeping key personnel involved and educated throughout the process • The PSM identified the right resources within each organization (grasped the business model, knew their own domain, and were willing to accept/explore change) to establish support 	<ul style="list-style-type: none"> • The PSM was late to identify many of the major challenges, including the mix of personnel involved in the effort – individuals who were not receptive to change • Precise checkpoints and updates were not established to ensure leadership and key stakeholders were aware and engaged • The direct involvement of the PSM was limited, specifically when generating courses of action and socializing potential alternatives with organizational leadership • Overestimated the capabilities of various individuals to drive the effort forward • Reactionary approach versus a proactive approach leading to stagnant progress of the implementation

In addition to the Program examples provided above, Figure 3 below highlights the difference in stakeholder engagement between the sample programs throughout the implementation process, factoring into their success when implementing an alternative sustainment strategy.

Engagement Chart – Program 1

Stakeholder	PBL Kickoff	Product Support Assessment	Partnership Assessment	Analysis of Alternatives	Implementation
PM Office	✓	✓	✓	✓	✓
PSM	✓	✓	✓	✓	✓
Supply Chain	✓	✓	✗	✓	✓
Contracts	✓	✓	✓	✓	✓
Finance	✓	✗	✓	✗	✓
Depot PoC	✓	✓	✓	✓	✓
Operations /Maintenance	✓	✓	✓	✓	✓

Engagement Chart – Program 2

Stakeholder	PBL Kickoff	Product Support Assessment	Partnership Assessment	Analysis of Alternatives	Implementation
PM Office	✓	✗	✗	✗	Alternative CoA Pursued
PSM	✓	✓	✓	✓	
Supply Chain	✓	✗	✗	✓	
Contracts	✓	✗	✗	✓	
Finance	✗	✗	✗	✗	
Depot PoC	✓	✓	✓	✗	
Operations /Maintenance	✓	✗	✓	✓	

Figure 3: Stakeholder Engagement throughout the PBL Implementation