

ready for combat

The smartest bomb or the stealthiest cruise missile won't do a warfighter much good if the launcher is sidelined for repairs. A look at the Pentagon's bold new plan for keeping its weapons systems combat ready.

WITH 300 SHIPS, 15,000 AIRCRAFT, 900 strategic missiles and nearly 400,000 ground vehicles of one type or another scattered around the globe, how do you keep them ready for combat? That's the quandary of the U.S. military. For decades, it has struggled to cut the amount of time its equipment spends in the military equivalent of the breakdown lane. After all, the smartest bomb or the stealthiest cruise missile in the world doesn't do a warfighter much good if, say, the launcher is unavailable for combat.

But today things are starting to improve. Warfighters—whether on the land, at sea, or in the air—are more likely to have equipment mission capable, ready for action than in the past. System reliability is improving. Vehicles that go down for maintenance or repairs are being returned to service more swiftly. Overall operational availability—the percentage of a fleet of weapons systems ready for combat—has in some cases moved north of 90 percent. And in those cases, the military's weapons system support costs have remained largely unchanged.

What has changed is how the U.S. Department of Defense (DOD) buys product support services for military equipment. Abandoning decades-old habits, the Pentagon has adopted a bold new plan to keep complex systems combat ready. It's using the new system with fighter jets. And submarines. And tanks. And unmanned aerial drones. As a matter of fact, the guys at the top are looking to apply it to all new weapons systems.

They call it performance-based logistics (PBL).



DOD PHOTO COURTESY OF U.S. NAVY

Pay for performance

Performance-based logistics represents a breakthrough in the way the DOD buys and pays for support services. Under this approach, the DOD contracts with a private company for product support, but instead of paying individually for things like parts, service and engineering time, it pays based on a fee per unit of usage and leaves it up to the supplier to keep the whole system running. In other words, the DOD no longer pays for work done on, say, a fighter jet but for work done by that jet.

At its most basic level, PBL isn't much different from an automaker's extended care warranty. The consumer buys a warranty at a fixed price, and it's up to the car manufacturer to figure out how to provide post-sales support and maintenance. Replace the family sedan with something like the Joint Strike Fighter, and that, in simple terms, is PBL.

It's important to note that PBL is much more than the swift, reliable delivery of repair parts. The ultimate objective is to maximize what quality expert Joseph Juran termed a product's "fitness for use." To go back to the analogy of the family sedan, a consumer buying a new car might be reasonably happy with a deal that guarantees the speedy delivery of repair parts. But that consumer would be happier still if the car didn't break down at all; or if it came with a guarantee that if it malfunctioned, it would be brought back on line within a specified timeframe; or if it came with a guarantee that it would require less maintenance than other models to deliver the same level of performance. PBL is designed to cost effectively drive fitness for use.

A whole new world

To say that PBL represents a departure from past DOD practice would be to seriously understate the case. In the past, the military dictated how private companies would handle support and paid for the service on a cost-plus basis (paying the costs of materials and labor plus a fixed percentage profit for the contractor, for example). Among other flaws (this was the same kind of system responsible for the infamous \$400 toilet seat), this practice offered virtually no incentive for contractors to improve support processes or overall system reliability and performance. Nor did it hold contractors accountable for the one thing that matters, the product's ability to perform the mission. If the contractor followed the contract's directions and met the transactional requirements, it got paid.

PBL changes all that. Now the DOD only dictates the desired outcomes related to the performance of the system in the field. It also pays based on that outcome. In fact, the most effective PBL contracts include only minimal discussion of the processes contractors must follow to meet the

mission: possible?

The notion of relying on commercial sources to provide performance-based logistics (PBL) support for weapons systems in the battlespace has triggered much debate. Opponents dismiss the idea as impractical at best, citing concerns such as the safety of contractors on the battlefield and how much support a contractor can realistically provide in hostile deployed environments.

Others see that as a goal well within reach. Based on the Army's experience with its Shadow Tactical Unmanned Aerial Vehicle (UAV) program, which is currently deployed and operational in Southwest Asia, it appears they may be right.

AAI Corp., the maker of the Shadow, provides support for the vehicle under a PBL contract with the Army. Under that contract, AAI guarantees 85 percent equipment availability—a provision it has consistently managed to meet or exceed. Although Army personnel operate and maintain the system, AAI has contractor field teams on site that provide "over the shoulder" support and rapid access to critical technical information when needed.

Interestingly, although the UAV deal was struck before Operation Iraqi Freedom, the agreement did not have to be rewritten when the conflict broke out, despite an associated increase in flight hours of more than 600 percent. Though it was never intended as a test case for PBL in the battlespace, that appears to be the UAV deal's destiny.

requirements. Instead, they focus on system performance expectations. It's up to the contractor to figure out how to put the supporting pieces together to achieve the goals.

The process typically begins with the development of the contract's objectives. The program manager for the government, who manages support throughout the life cycle of the system, works with the warfighter team—whether soldiers in the Army, sailors in the Navy, airmen/airwomen in the Air Force, or Marines—to determine the specific system performance outcomes required. That program manager then passes along the end requirements to the contractor (who is usually, but not always, the system's manufacturer), using a performance-based logistics contract.

The lead contractor, in turn, passes these requirements back through the supply chain to its own suppliers, including some that are part of the government support infrastructure (e.g., service-owned maintenance depots). It is free to decide—within statutory, regulatory and policy constraints—how it will fulfill the contract and with whom it will work, but the contractor at the top of the pyramid (known as the Product Support Integrator) is ultimately accountable to the government. And what it's accountable for is the system performance delivered, not the activities required to achieve it. If the supported system performs in the field, the contractor earns revenue. If the system performs well in the field, the contractor may earn bonuses. If it doesn't, the contractor takes a financial hit and will have to answer to both the government and its shareholders.

Evolution, not revolution

One of the earliest examples of PBL dates back to 1996 and the DOD's decision to close the Sacramento Air Logistics Center, a major support site for the Air Force F-117 Nighthawk stealth fighter. As with any base closure, most people saw the announcement as an economic blow to the region. But one enterprising corporation, Lockheed Martin, saw it as an opportunity.

Shortly after the news broke, Lockheed Martin, which is the Nighthawk's manufacturer, went to the Air Force with an unconventional—yet attractive—proposal. Lockheed Martin would take over

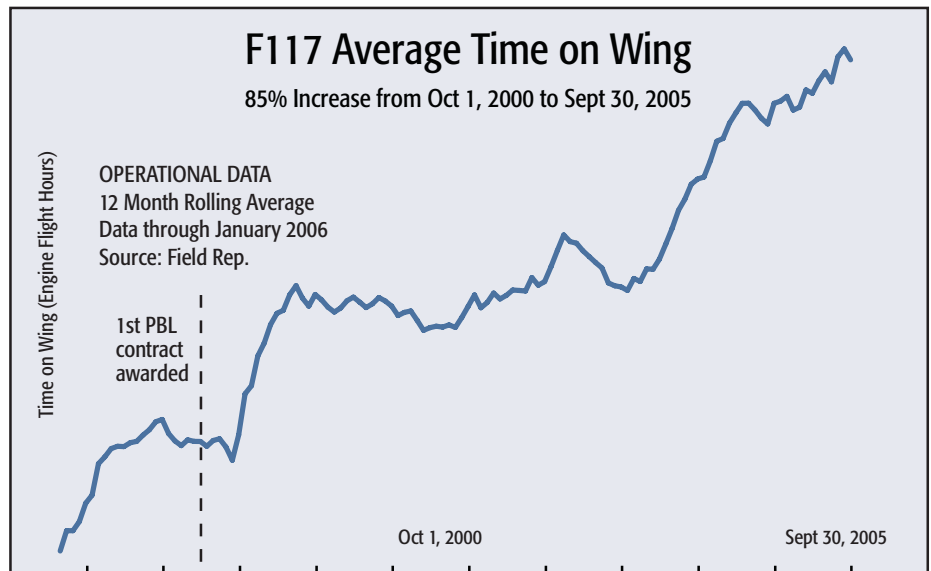
the majority of F-117 non-core support functions (that is, those not handled exclusively by the military for strategic reasons) under a system that tied its compensation to its achievement of specific support performance targets. The Air Force liked the concept and implemented the new “performance based” approach in 1998. Today, Lockheed Martin is responsible for almost all system level support of the F-117.

This contract laid the conceptual foundation for many of the now standard components of PBL. In fact, this early success—along with many other programs that have followed—has helped to make PBL the preferred logistics support strategy for the U.S. DOD. Currently, there are more than 200 PBL contracts in place across the DOD, including all uniformed services.

That's not to say the concept hasn't evolved over the years, however. PBL is not a “one and done” approach. It is a journey where all parties now want the same thing: cost effective and reliable system performance. According to Jim Hall, acting assistant deputy under secretary of defense for logistics plans and programs, the senior DOD official responsible for PBL, “Maximizing PBL benefits will continue to drive us to develop a more complete understanding of the risks and uncertainties that must be addressed, in order to expand adoption and meet the requirements.” As the DOD has gained experience with PBL programs, it has modified performance objectives where appropriate and become more sophisticated in its approach to PBL contracting.

The payoffs

Word that virtually every new major DOD system acquisition is being designed and fielded with the expectation that operational support will be provided under a PBL contract will come as no surprise to anyone familiar with PBL's results. The success of performance-based logistics in



improving readiness and availability has been proven time and time again.

In the case of the F/A-18 fighter aircraft alone, PBL has made an astounding difference, says Larry Garvey, director of the supply chain solutions division at the Naval Inventory Control Point. Garvey reports that the Navy has seen material availability improve from 67 percent with the F/A-18 C/D fighter aircraft when support was provided under traditional contracts to 85 percent for the F/A-18 E/F aircraft under PBL. In fact, the mission-capable rates of the F/A-18 E/F have improved by over 10 percent, as compared with the earlier versions.

It's the same story with the Aegis cruiser missile, reports Lou Kratz, former assistant deputy under secretary of defense for logistics plans and programs and a long-time champion of PBL. Kratz says material availability has soared from 62 to 94 percent for the Aegis cruiser under PBL. That has contributed to an overall improvement in the Aegis system's availability.

For another example of how PBL can help solve problems with weapons system downtime, you need look no further than the PBL agreement struck with engine-maker Pratt & Whitney. Pratt & Whitney won its first PBL contract to provide propulsion system support for the C-17 aircraft in 1997 (as one of the suppliers to the lead contractor, Boeing), and its performance has earned it follow-on contracts and extensions ever since. Under terms of the deal, Pratt & Whitney has agreed to keep a certain number of its F117 engines available at specified locations ready for use at all times. In return, Pratt & Whitney is paid a fixed rate per engine cycle (as determined by a complex formula that weights missions and flight hours, along with takeoffs, landings, environment and other factors), rather than for the parts and effort needed to keep the engine in working condition.

The results have been extraordinary. As the accompany-

ing graph illustrates, the engines' "time on wing" (the interval between service events that require an engine's removal from the wing) has soared under PBL, far exceeding the Air Force's expectations. For the DOD, that has translated into a significant increase in aircraft uptime and reliability at no added cost.

It's the customer, stupid

Of course, performance-based logistics initiatives need not be—and have not been—limited to the defense world. The concept can be applied in a variety of environments. In fact, it is making inroads in the commercial marketplace. Mark Hillman, a senior supply chain analyst with AMR Research,



says he is seeing more and more PBL-like implementations, including full-service leases and warranties. "It's something of a trend," he says, "a movement toward availability-based optimization techniques, driven by a need to meet service-level agreements."

That has profound implications for supply chain management. Performance-based logistics represents an entirely new way of think-

ing about the supply chain—one where the emphasis shifts to the customer's needs, not the supply chain's performance. In a PBL world, the supply chain manager no longer focuses solely on ways to boost performance against internal measures like fill rates, inventory turns and on-time shipments. Instead, the job is to work as part of a team to meet the end user's needs.

Consider the example of a company that has agreed to provide PBL support for, say, a magnetic resonance imager (MRI). Under a traditional arrangement, if the unit broke down, the supply chain manager would be responsible for seeing that repair parts were shipped within a specified lead time. Under a PBL contract, by contrast, that supply chain manager would be part of a team responsible for doing whatever it took—dispatching field engineers, delivering spare parts, calling in technical experts—to get the equipment operational within a specified window.

And it doesn't stop there. Under PBL, the supply chain manager would also have similar responsibilities when it came to routine maintenance for the MRI, as well as for engineering changes and scheduled upgrades. On top of that, the manager would be accountable for the performance of the company's own suppliers—vendors, carriers, third-party service providers and so forth.

Those new responsibilities are just the half of it. For supply chain managers, a shift to PBL also brings a wholesale change in mission. It's no longer about forecasting what parts your customers will need and faithfully shipping them. It's about understanding the product performance your customer needs and coordinating with your supply chain partners to deliver that support. □

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