

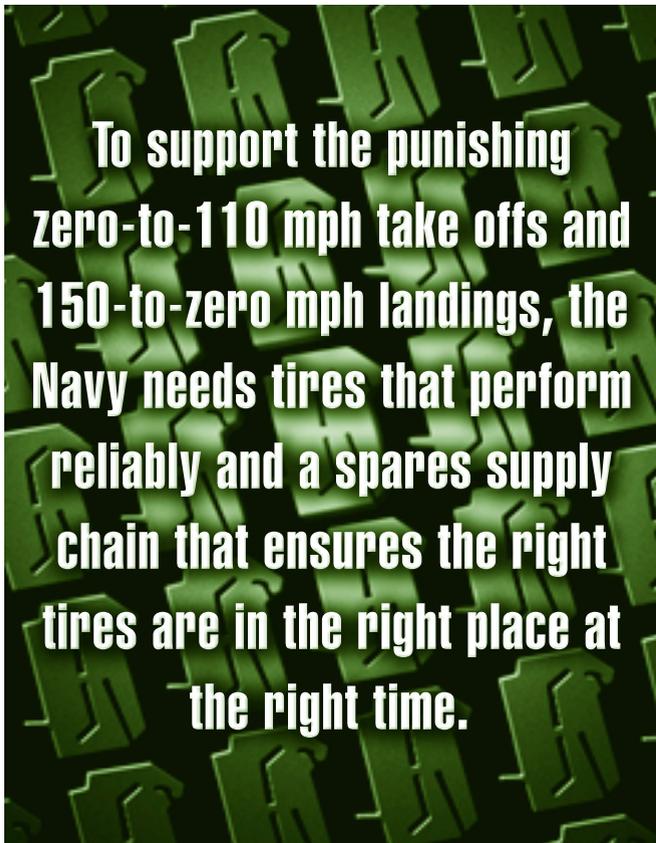
# Performance-based Logistics

## Putting Rubber on the Ramp

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**A** launch every 30 seconds, a trap every 60 seconds—that describes a typical cycle time for U.S. Navy and U.S. Marine Corps carrier-based aircraft. To support the punishing zero-to-110 mph take offs and 150-to-zero mph landings, the Navy needs tires that perform reliably and a spares supply chain that ensures the right tires are in the right place at the right time.

Until 2001, that supply chain included a huge in-stock inventory at Navy and Marine Corps air bases—but that inventory often didn't have the right mix of tires. In short, the Navy was maintaining burdensome overhead costs for shipping and storage but didn't have the metrics or processes in place to guarantee that the right tires were in the right place at the right time.



### Cooperative Performance-based Logistics Program

In 2001, the Navy Inventory Control Point (NAVICP) reinvented the Navy tires supply chain through a performance-based logistics (PBL) effort with Michelin Aircraft Tire Company, LLC, and Lockheed Martin. NAVICP—which, as the Navy's agency to procure, manage, and supply spare parts for naval aircraft, submarines, and ships worldwide, is responsible for more than 400,000 items of supply, \$27 billion of inventory, and \$4.2 billion in annual sales—drove down costs and improved service with PBL efforts in several other supply chains it oversees.

PBL is consistent with the increasing focus of the U.S. Department of Defense on managing performance in terms of readiness and cost to meet warfighter requirements. PBL encompasses all activities related to delivering spare and repair parts. It includes manufacturing, repair, warehousing, inventory management, transportation, and related functions. To date, performance-based logistics strategies are used in 80 major DoD systems.

The use of PBL shifts the responsibility for demand forecasting and inventory management to industry, allowing DoD organizations such as NAVICP to concentrate on customer service to the fleet and field, and on appropriate contractor performance oversight. As part of a PBL program, there are incentives to industry to reduce demand for these parts through reliability growth and obsolescence management by using multi-year, fixed-price contracts that include specific material availability and delivery performance requirements. The Navy Aviation Tires PBL program is a prime example of those benefits.

Michelin and Lockheed Martin combined forces in 2001 to manufacture and deliver naval aircraft tires to all U.S. Navy, U.S. Marine Corps, and foreign military sales customers. The contract set a precedent, as it was the first time the DoD turned to PBL support for new and repairable tires. Michelin is the prime contractor for the program and manufactures and supplies the tires. Lockheed Martin is a subcontractor to Michelin and provides the supply chain services, such as demand forecasting, order

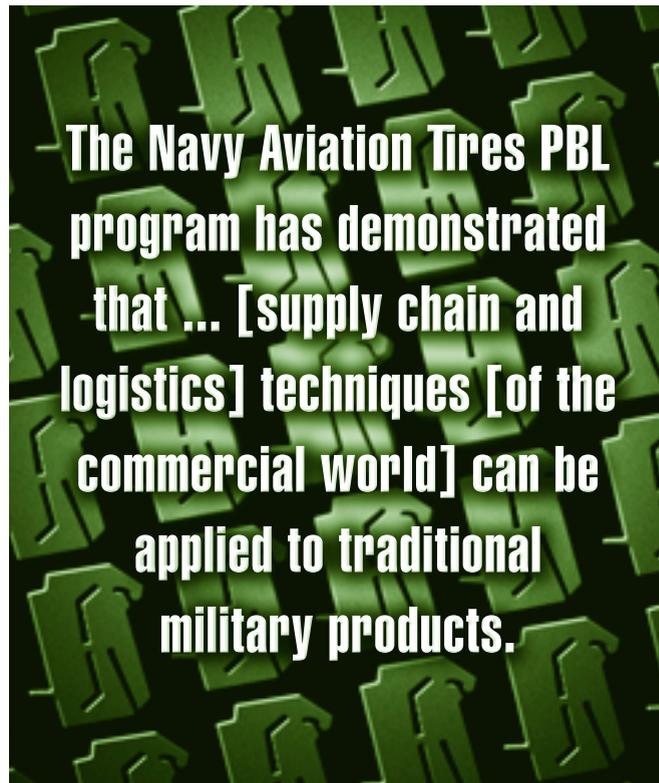
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fulfillment, and inventory management. Eagle Global Logistics (EGL) provides warehousing and reverse-logistics services. This supply chain solution combines expertise in software, hardware, technology, and PBL-related experience with the unique demands of the military. However, its goal remains the same—the right tires at the right place at the right time.

To meet that goal, Michelin and Lockheed Martin designed, implemented, and now operate a supply chain within the contractual goal of a 95 percent on-time delivery schedule (two days in the continental United States and four days outside the continental United States) to all U.S. Navy locations. An additional goal was to reduce retail inventory levels by demonstrating the reliability of the supply chain through improved, timely deliveries.

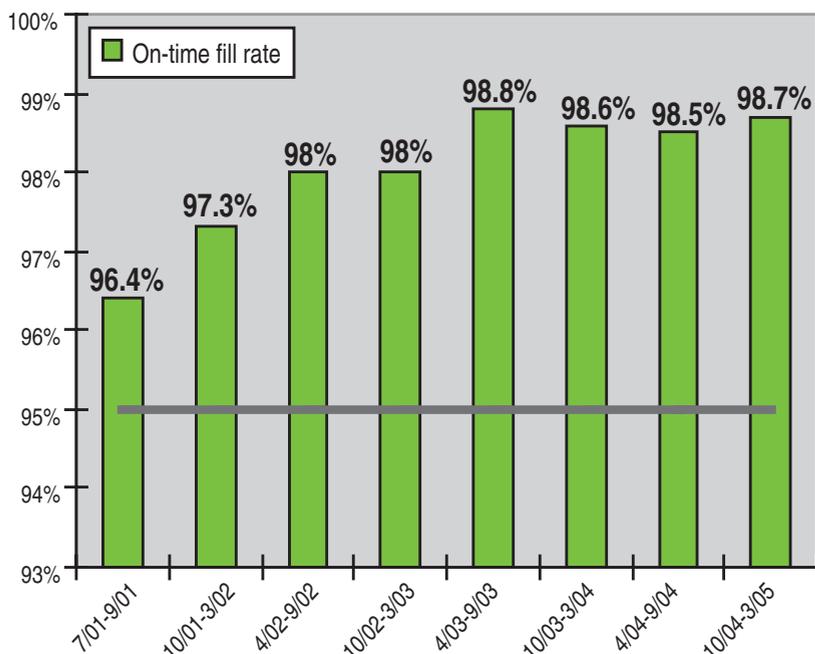
The first tire shipment took place on July 9, 2001, and the program now supports 16 different types of military aircraft using 23 tire sizes. In the first quarter of operation, the Navy Aviation Tires PBL program improved on-time tire delivery from 86 percent to 96.4 percent, and sustained performance remains in the high 90s, as shown in Figure 1.

Since the first delivery, the team has attained a 100 percent fill rate; delivered over 165,000 tires world-wide; handled overall surge requirements of 34 percent in one month, with a 236 percent surge for one particular part number over normal monthly demand; reduced on-hand inventory from a year-and-a-half supply to 90 days; and caused a 75 percent reduction in retail-level inventories



at continental United States air stations (Figure 2). The joint team manages about 1,200 requisitions and delivers over 3,000 tires per month.

The Navy Aviation Tires PBL program also includes full support to U.S. Navy aircraft during operations Enduring Freedom and Iraqi Freedom, with as many as six aircraft carriers deployed at one time. Based on their own calculations, the Navy projects significant cost savings totaling more than \$46 million over 15 years as a result of these accomplishments. The overall reduction in the Navy infrastructure and capital investment has provided an integrated product-life-cycle approach to lowering the cost of ownership over time, while providing responsive, timely, and affordable support to the fleet.

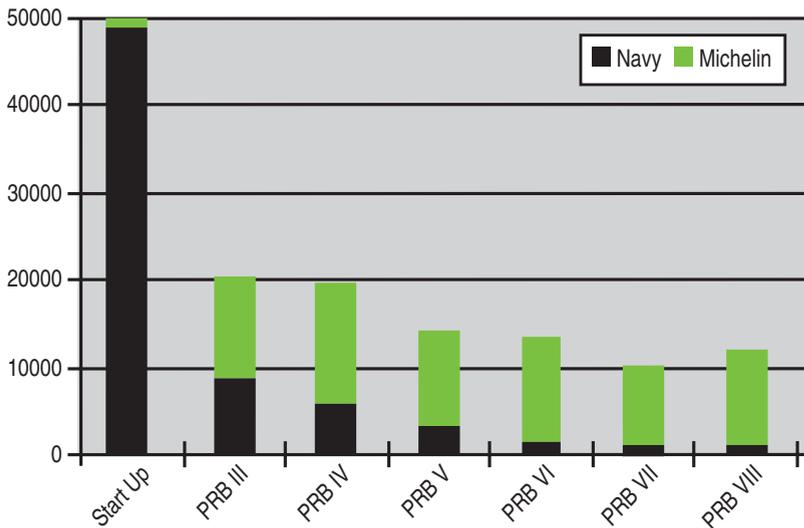


**FIGURE 1. Ninety-five Percent On-time Fill Rate Exceeds Navy's Contractual Goal**

### How the PBL Program Works

Michelin, Lockheed Martin, and EGL are integrated through a Lifetime Support Command Center (LSCC) that controls all requisitions from the fleet and provides warehouse management, inventory control, and data to Michelin to maintain their internal systems with program data.

To ensure that the whole team's performance is tied together, the performance measurement for each subcontract is tied to the requirements in the prime contract. This ensures that the requirements of the



**FIGURE 2. Seventy-five Percent Reduction in Naval Air Station Retail Levels**

prime contract are met, and each member of the team is successfully fulfilling its role.

All participants along the supply chain—from command center analysts, to warehouse operators, to transportation providers, to the customer—fully understand the goals of the program and actively monitor the performance measurements. For example, with the LSCC operated by Lockheed Martin serving as the hub, projected needs and orders are shared with Michelin’s manufacturing plant and EGL. Michelin will ensure the tires projected and ordered are ready for pick up, and EGL will ensure the tires are positioned for on-time delivery.

In addition to providing complete order fulfillment, inventory control, warehouse management, and visibility, the LSCC also provides the program manager with the data and tools necessary to achieve the required level of on-time delivery performance. Using electronic data interchange and Web-based technology to transmit requisitions, provide real-time shipping status, and provide product support information, the Michelin-Lockheed Martin team can identify customer needs immediately—and react fast.

The LSCC also uses SCM +™, a software solution specifically designed for PBL processes that combines commercial off-the-shelf software and in-house-developed software. This solution was developed to ensure the industry team involvement was transparent to the fleet customer. During implementation of SCM + and wherever possible, the majority of the legacy processes and procedures remain in place. As a result, the same ordering mechanism that had been in place continues to be used today, so as far as the ordering activity is concerned, industry involvement is transparent, and the activity continues ordering tires from NAVICP. Additionally, SCM +

integrates requirements forecasting, inventory planning, resource constraint planning, purchasing, optimization, and transportation planning and execution. With this solution, product can be delivered anywhere in the world, on time, with performance measured in hours, not days.

### Commercial Success on the Front Lines

The commercial world has developed supply chain and logistics processes to meet the rapid changes in consumer tastes and in technology, and to be able to compete in the current and future global marketplace. The Navy Aviation Tires PBL program has demonstrated that these techniques can be applied to traditional military products and that real value can be achieved when there is good communications and coordination

among the vendor(s), the customer, and the ultimate end-user. In addition, this approach can be applied to any type of product, from basic commodities through complex electronic equipment.

The DoD continues to move forward with similar PBL implementation concurrent with other logistics transformational approaches, such as Lean Six Sigma, BRAC (Base Realignment and Closure), and reliability improvements. Industry, as a DoD partner, has proved its capability on many occasions and can aid in providing deployed warfighters with reliable systems and timely delivery of parts.

Our nation’s warfighters must have the supplies and equipment at the exact moment they need them. Warfighters are focused on outcomes, on accomplishing their missions. They want to have full confidence that they will have the equipment they need where they need it, when they need it, and that it will perform the way it’s designed to perform when they use it. With the aggressive implementation of PBL in future programs, the Department of Defense should consider the proven value of industry-partnership PBL efforts, such as the U.S. Navy Aviation Tires PBL program, and convert existing corporate contracts to performance-based contracts. This will drive industry to higher levels of value-added services by moving to system- and system-of-systems-level PBL efforts for new platforms in the future.

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