

**The Secretary of Defense Performance-Based Logistics Awards Program  
For  
Excellence in Performance-Based Logistics  
In  
Life Cycle Product Support**

**Section 2  
Summary of Criteria Accomplishments**

**Improvements in Warfighter-Based Capabilities and Outcomes**

**Mission Success:** The AN/APS-137D(V)5 is the primary radar capability for the Navy's P-3 Anti-submarine warfare (ASW)/Anti-surface ship warfare (ASuW) Improvement Program (AIP) aircraft. It enables the P-3 AIP patrol aircraft to better perform vital maritime patrol ASW and ASuW missions and anti-ship surveillance & targeting. The P-3 AIP Radar provides the aircrew with the capability of long-range detection, tracking, classification, and identification of contacts. Capabilities include detection of periscopes in the challenging environment of high sea clutter on the open ocean for ASW; surface search, tracking, and targeting of surface craft at long ranges at both the blue water and littoral zones using Inverse Synthetic Aperture radar (ISAR) for ASuW; high resolution imaging using Synthetic Aperture Radar (SAR) for classification of stationary ships and boats in the littoral region; over-land imaging and surveillance with Global Positioning System (GPS)-aided precision targeting; radar-aided navigation with graphical display of both land and sea return information; and weather avoidance for mobility operations.

The overall objective of the APS-137 contract is to meet and exceed Fleet readiness expectations and requirements. The Naval Inventory Control Point, Philadelphia, PA, selected Raytheon Space and Airborne Systems as the Prime Contractor for the ten-year Performance Based Logistics (PBL) contract. PBL program scope includes logistics and inventory management, depot repair and spares production, obsolescence management, sustaining engineering, and a reliability growth program. Since award of the PBL, all contractual availability and reliability metrics have been

exceeded, and the joint government/industry team has succeeded in dramatically improving support to the Fleet.

**Materiel Availability:** The APS-137 Radar is currently installed on 72 Navy P-3 AIP aircraft with total operations of approximately 26,000 flight hours per year. NAVSUP WSS awarded the ten-year \$120.7M contract to Raytheon, McKinney, Texas in Dec 2006. The PBL contract is spread over a five-year base, with one three-year, and one two-year option, all Firm-Fixed Price (FFP). The PBL provides support to nineteen radar Weapons Replaceable Assemblies (WRAs) including the transmitter, receiver, power supply, antenna, and signal data converter. Prior to the PBL contract the AN/APS-137D(V)5 radar performance was characterized by both low availability and reliability. Lower than 50% availability degraded Fleet readiness and mission capability. Pre-PBL, backorders averaged in the 40 to 60 range. Under the PBL, Raytheon is delivering significant and sustained improvements in material availability. Since PBL inception in Dec 2006, availability of over 92% has been maintained and has far exceeded the contractual requirement of 75% at no additional cost. In FY11 and FY12 through April 2012 availability is 100%. Over 1200 Fleet demands have been satisfied via the PBL since inception. The PBL includes coverage to 15% above forecasted flying hour levels to provide continued availability during surges in Fleet operations.

**Materiel Reliability:** The APS-137 Radar was initially deployed to the Fleet in 1998 and system reliability upon delivery was at the specification requirement of 125 hours. However, after several years of operations, system field reliability declined to a low point of 86 hours Mean Time Between Unscheduled Removals (MTBUR) in 2006 due to substantial increases in failure rates and no fault founds. The PBL includes specific reliability improvement metrics by year designed to reverse this trend and to improve performance beyond specification requirements. Achieved MTBUR through April 2012 is 215 hours, exceeding the current contractual requirement of 169 hours, a documented 127% improvement in MTBUR since contract inception. The net effect is

that the program has reduced Fleet WRA demand by 40%, resulting in 605 *fewer* returns to the depot during the first four-plus years of the PBL.

Contractual reliability improvement guarantees and a firm-fixed price contract incentivize Raytheon to improve reliability, maintainability, and supportability to maximize profit. Since award, fifteen improvements to the radar have been implemented and introduced to the Fleet. Radar components processed to date are remaining on wing longer, significantly reducing Fleet maintenance burden. Raytheon tracks and analyzes reliability at both the end item (WRA) level and at the sub-component level, allowing for focused attention on identified “bad actors.”

Component level data is a sub-set of the system level reliability metric. The system level contractual reliability metric (MTBUR) has grown from 110 hours in the first year of the contract to 210 hours in 2012 already exceeding the projected increase to 195 hours year ten of the PBL.

[See Figures 1 & 2 for selected details.] All reliability goals have been exceeded to date. The field engineering teams working with Raytheon Technical Support Representatives (TSRs) and Fleet avionic technicians have identified root causes to many field induced failures, and implemented immediate corrective actions not only on system units but also on aircraft installation and wiring.

#### **Sustainment Strategy Effectiveness/Efficiency**

**Ownership Cost Reduction:** The NAVSUP WSS Business Case Analysis (BCA) documents savings of \$4.5M over the ten years of the contract. Raytheon’s proposal both met the BCA affordability criteria and was determined fair and reasonable by the NAVSUP WSS Contracting Officer. The analysis has resulted in \$4.5M direct reductions to the Fleet Flying Hour Program (FHP) budget over the period of performance, true “hard” savings. The long-term nature of the PBL allowed Raytheon to meet affordability criteria by enabling a reengineering of the support process. With a guaranteed business base, Raytheon, as the Original Equipment Manufacturer (OEM), brings its best practices and in-depth knowledge of the APS-137 system to sustainment support. The firm-fixed price nature of the PBL incentivizes Raytheon to make investments and

support decisions that pay off over the long-term through improved parts support, investments in reliability, optimized depot processes, and decreased depot returns. Raytheon quickly and efficiently directs resources where required to deliver the performance outcome specified in the contract. Results are further enabled through efficient teaming and sharing of best practices between government and industry leading to effective and affordable support. In addition, a gain sharing provision is included in the contract whereby the government will share in the savings associated with fewer repairs in the event that reliability improvements are greater than 25% above the guaranteed minimum improvements negotiated in the contract for each radar system component. The bottom line is that the Navy is experiencing truly significant improvement in support for less cost than would have been paid under traditional support.

**Public-Private Partnering:** Although depot touch labor is performed at Raytheon, the PBL is a true partnership and collaboration between government and industry. In many areas of program support, the Navy and Raytheon work closely together. Navy and Raytheon team members meet frequently at Program Management Reviews (PMRs) to analysis engineering, obsolescence and support issues. Raytheon TSRs provide on-site guidance and technical expertise to Navy maintainers. Fleet Readiness Center Southeast (FRCSE) in Jacksonville manufactures an antenna cable developed in coordination with Raytheon that facilitates maintenance practices and resolved a long-standing support issue. Effective coordination, communication, and sharing of best practices among all members of the Navy-Raytheon Integrated Product Team (IPT) are key to the success of the PBL program. Most importantly, the PBL strategy is integrated into and maximizes use of existing Navy logistics infrastructure. All support flows through the current Navy Integrated Supply System and is transparent to Fleet customers.

**Systems Engineering Approach:** The APS-137 PBL contract deploys Raytheon TSRs to each of the main P-3 CONUS home bases. The TSRs provide on-site and on-time technical support to Navy technicians on the complex radar system. Training of young Navy technicians with hands-

on Raytheon TSR tutoring, while performing maintenance tasks, has proved to be highly effective in reducing the overall Could Not Duplicate (CND) rate, i.e., no fault founds, by two-thirds from 96 in 2006 to 22 in 2012. The associated cost avoidance is significant as the system average cost of a CND is 15 man-hours and \$57,000. TSRs have also provided support to forward deployed P-3 AIP squadrons in Iraq and Qatar. Raytheon provides engineering support and investigation for on-aircraft discrepancies and Fleet training. Quarterly meetings are held with the Fleet patrol wings for the specific purpose of promoting communication between the USN maintainer and the Raytheon engineer. This communication promotes the win-win arrangement that PBLs provide.

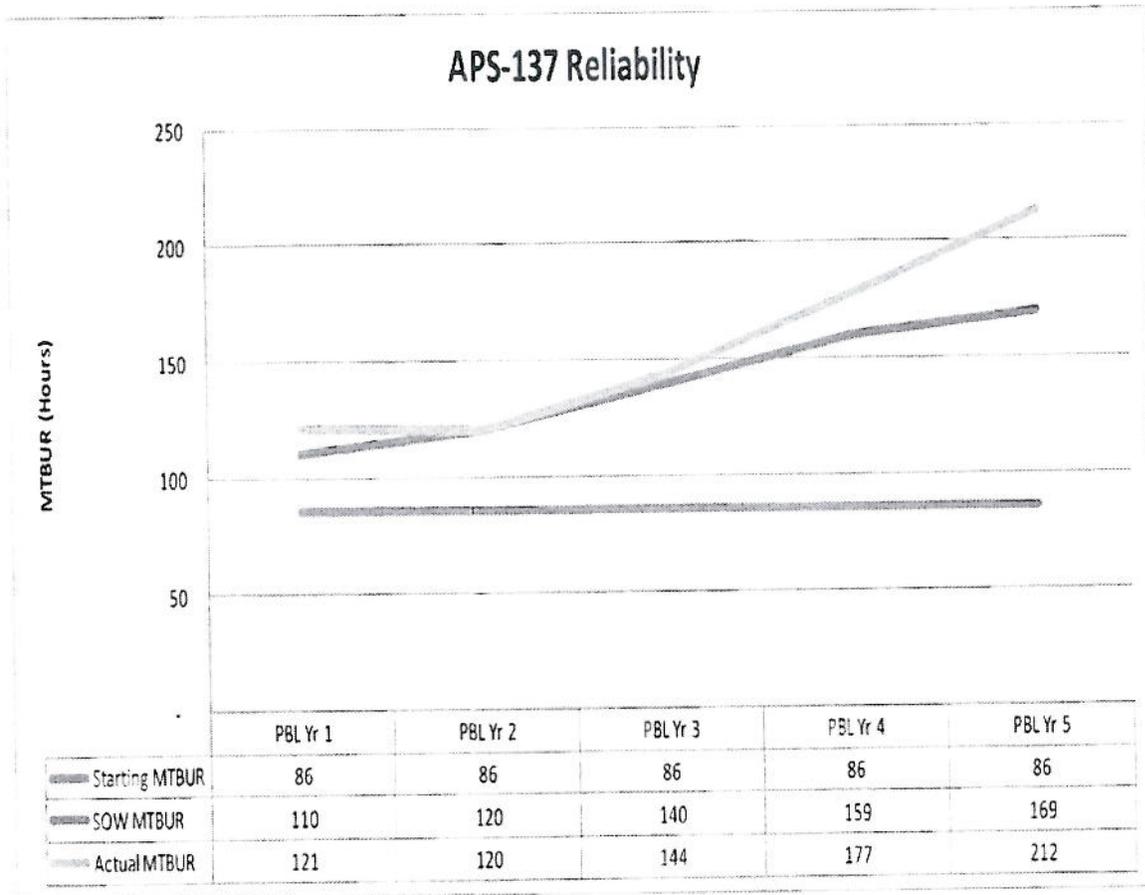
**Footprint Reduction:** The guaranteed reliability built into the PBL has efficiently supported an Organizational (O) to Depot (D) maintenance concept. Avoiding the need for an Intermediate (I) level maintenance infrastructure corresponds to a significantly smaller logistics footprint. The structure and efficiencies of the P-3 AIP Radar PBL have allowed for a 50% reduction in demands upon the logistics system since fiscal year 2006.

**Obsolescence Management:** Raytheon is responsible for obsolescence management on the program. Raytheon's process includes a proactive approach to qualify new sources for obsolete parts, initiate lifetime buys, and recommend material/component design changes. Expanded Class II Engineering Change Proposal (ECP) authority allows Raytheon to quickly implement changes. The obsolescence team meets twice every month and is actively working on nine critical parts and monitoring many more.

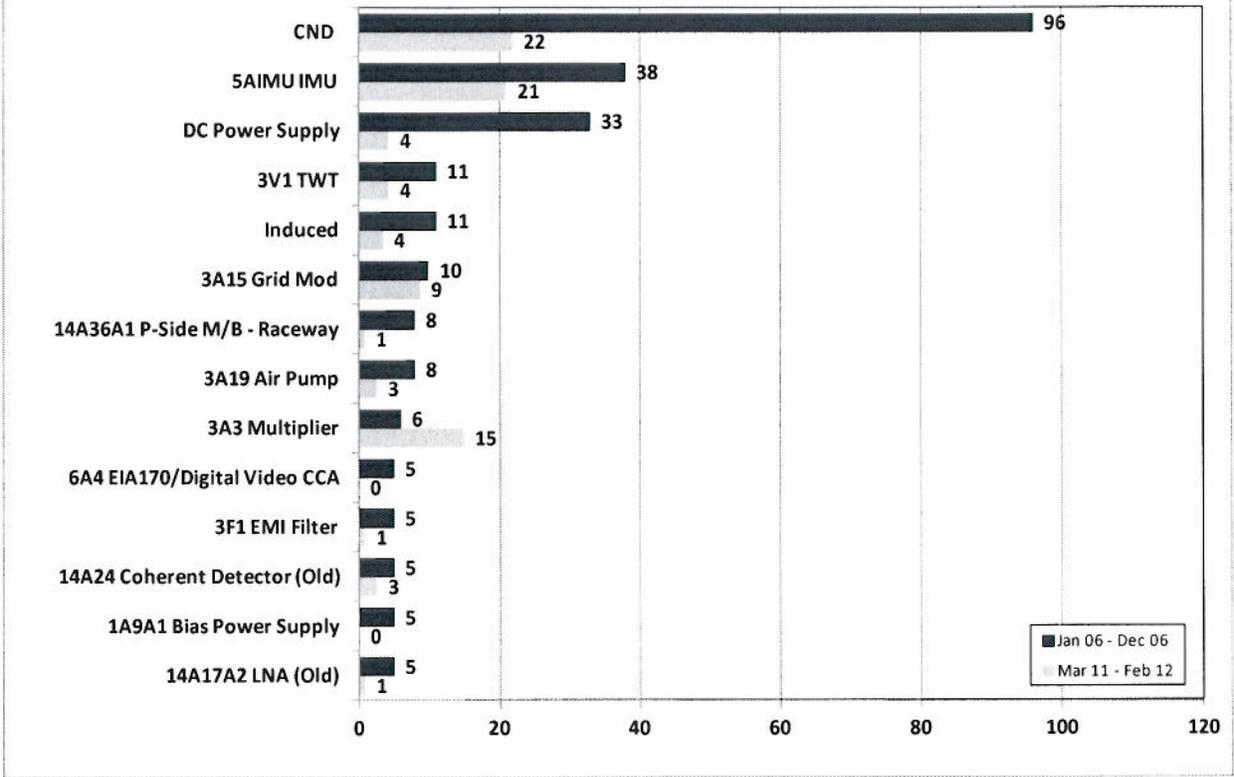
**Innovative Contracting Support Approach:** The PBL is clearly focused on the desired outcomes of DoD Acquisition Reform guidance. The BCA ensures affordability and the firm-fixed price contract controls cost growth. PBL metrics incentivize Raytheon innovation and productivity; the PBL structure maximizes use of and maintains existing Navy infrastructure and expertise. Current performance improvements will be captured in the follow-on PBL as demand and cost parameters are re-baselined and through the BCA "should cost" analysis.

Figures 1 & 2: APS-137 Reliability Improvements

## DO5 MTBUR at 212 Hours



### Current Returns Normalized to 2006 Flight Hour Data



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**Section 4  
Achievements**

The APS-137 PBL team has set the benchmark for Performance Based Logistics at the sub-system level. The results of the team's efforts culminated in the award of a ten-year contract valued at \$120.7M. The PBL supports 72 Navy P-3 Anti-submarine warfare (ASW)/Anti-surface ship warfare (ASuW) Improvement Program (AIP) aircraft with total operations of approximately 26,000 flight hours per year. Raytheon responsibilities under the contract include logistics and inventory management, requirements determination, depot repair and spares production, sustainment engineering, and a reliability growth program. The proactive approach fostered by PBL delivers \$4.5M in direct savings to the Fleet Flying Hour Program (FHIP) and has improved availability to 99% and increased reliability by 121%. The firm-fixed price PBL incentivizes Raytheon to make investments and support decisions that pay off over the long-term through improved parts support, investments in reliability, optimized depot processes, and decreased depot returns. Raytheon manages all facets of the supply chain and related Integrated Logistics Support (ILS) elements to ensure availability of spares to the warfighter. Raytheon brings its' best practices and in-depth knowledge of the APS-137 system to sustainment support and integrates that knowledge within existing infrastructure in coordination with Navy members of the PBL team. The P-3 AIP Radar system currently stands at its highest level of combat readiness and customer satisfaction since its introduction to the Fleet. A significant portion of this record breaking performance is attributable to the successful implementation of the PBL program. The PBL provides unprecedented cost-wise performance to the Fleet.