

OFFICE OF THE SECRETARY OF DEFENSE

Report to Congress
on

SUSTAINMENT OF
KEY MILITARY EQUIPMENT

FISCAL YEAR 2006



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INTRODUCTION

In accordance with H.R. 1815, the National Defense Authorization Act for Fiscal Year 2006 (Section 361, Reports on Budgeting Relating to Sustainment of Key Military Equipment), the Department of Defense (DoD) is pleased to submit this report to Congress, outlining our strategies for sustaining key military equipment and providing for modernization. The report also addresses the resources required and provided to achieve the strategies as well as any risks related to resource constraints. The Department has a strong framework in place to identify and provide sustainment and modernization resources. Initiatives are on-going to ensure that an optimum sustainment and modernization posture is achieved within the available resources.

This report specifically discusses the framework provided by the Planning, Programming, Budgeting and Execution System (PPBE) and weapon system program management approach used by the Department for management of its key military equipment. Additionally, it also addresses influential initiatives such as provision of depot maintenance Core capabilities, continuous process improvement (CPI), and condition-based maintenance plus (CBM+).

Section 1 of the report discusses strategic directions. Section 2 reviews required budgetary information for Fiscal Year 2007.

SECTION 1 STRATEGIC DIRECTION

BACKGROUND

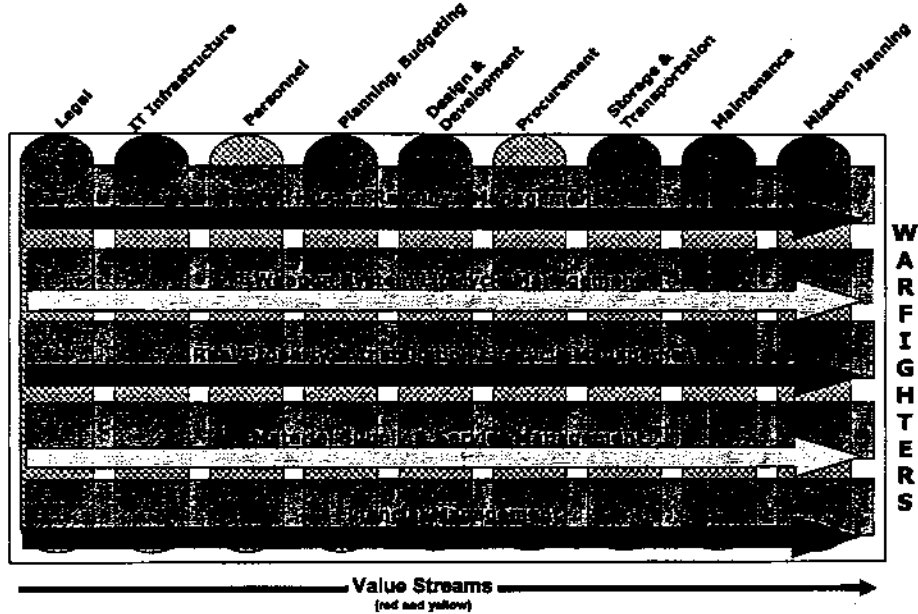
The Department of Defense spends substantial resources each year on the sustainment and modernization of its key military equipment. Each expenditure is justified based on a documented need. New equipment is typically in the highest state of material condition, fully capable of being safely and effectively used for its intended purpose. Over time, material condition can degrade through normal wear, mishap, or battle damage. If material condition becomes unacceptable, the equipment must be repaired or otherwise restored so it is again available to meet the need for which it was purchased. That is the task of the weapon system sustainment value stream.

Materiel which is available to be put to its planned use is "ready materiel." Put another way, "materiel readiness" exists when materiel is available and ready for use (RFU). The achievement and sustainment of planned materiel readiness defines and quantifies the performance objectives of the DoD enterprise weapon system sustainment value stream and the Department's essential maintenance and sustainment infrastructures.

A comprehensive value stream focus is essential to achieve our sustainment objectives. As illustrated in Figure 1 below, numerous functional areas within the DoD enterprise as well as many management communities are involved in sustainment operations. DoD's complex enterprise creates myriad nodes, interfaces, activities, and other "touch points" that are considered parts of specific value streams—that comprise the enterprise—and that may contribute to the support of sustained readiness. DoD weapon system management and support includes all of the functional

areas and communities identified in the figure, including acquisition processes, the use of the weapon system for its intended purpose, all maintenance activities required at the field and depot levels, supply and transportation activities, and mission planning.

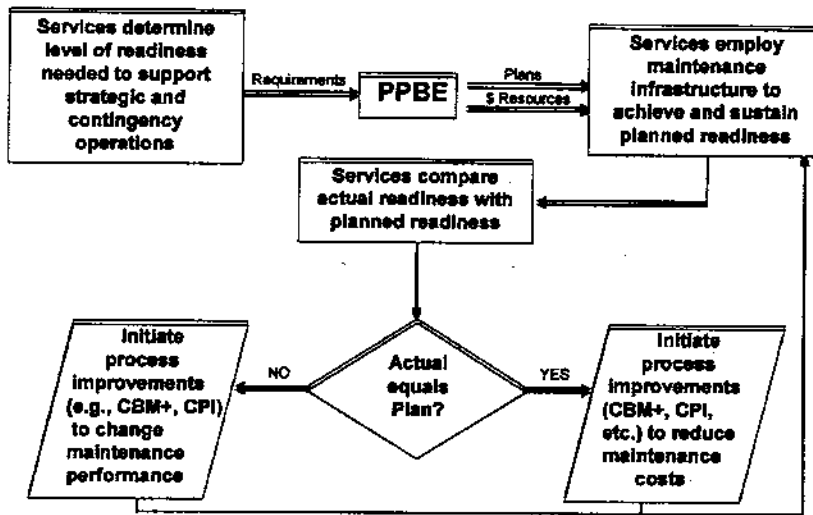
Figure 1. Value Streams and the DoD Enterprise



Current DoD maintenance policy, as set forth in Department policy guidance (DoDD 4151.18), sets the stage for an effective maintenance program. As depicted in figure 2, that policy calls for the Military Services to:

- determine the level of readiness necessary to support planned national defense strategic and contingency operations;
- plan for, establish and resource a maintenance capability which can deliver efficient and effective performance to the operating forces;
- comply with periodic and as-required reporting requirements; and
- take steps to improve the performance of the maintenance infrastructure if readiness is sub-standard or alternatively to reduce the cost of maintenance if readiness is on plan.

Figure 2. Managing to Achieve Planned Readiness



STRATEGY

A number of different, but equally successful strategies are employed within the Department to achieve these policy objectives. A common feature of all strategies, however, is the establishment of a weapon system maintenance capability that effectively sustains planned materiel readiness at the lowest possible life-cycle cost. It is the challenge of optimally balancing maintenance effectiveness with cost that drives the selection of a particular maintenance strategy for military equipment. Alternative strategies available include:

- equipment durability strategy (militarized design vs. commercial off-the-shelf),
- equipment reliability strategy (high-reliability design vs. low-reliability design),
- troubleshooting strategy (built-in diagnostics vs. external check & test),
- repair strategy (repair vs. discard),
- level of repair strategy (field-level maintenance vs. depot-level maintenance),
- scheduled maintenance strategy (preventive maintenance vs. corrective maintenance),
- outsourcing strategy (organic maintenance vs. contract support),
- incentives strategy (maintenance as a mission vs. performance-based maintenance),
- resourcing strategy (e.g., mission funding vs. working capital funding (WCF)).

The selected maintenance concept for military equipment employs the best balance among alternative strategies consistent with the item's intended operational employment. Included, in addition to strategy for cost-effective item maintenance, is

- strategy for cost-effective spares procurements and other materiel purchases in support of both maintenance and operations,
- strategy for cost-effective materiel supply chain management,
- strategy for cost-effective materiel transportation and distribution, and
- strategy for cost-effective in-service engineering (including equipment reliability monitoring and reliability improvement).

In combination, these strategies represent the military equipment sustainment strategy. The selected sustainment strategy complements, and is complemented by the weapon system modernization strategy.

Because of the high degree of variability in weapons technology, cost, intended operating environment and anticipated operating tempo, as well as fact-of-life considerations such as the average age of the weapon system inventory and changing industrial base capabilities, the Department does not mandate a preferred weapon system sustainment strategy. However, there are lessons learned and benchmarking data from innovative maintenance and support plans that are employed to determine the optimum DoD weapon system sustainment strategy for given systems.

It is DoD policy that the Services take steps to improve the performance of the maintenance infrastructure if readiness is sub-standard or alternatively to reduce the cost of readiness if current readiness meets plan. In other words, there is an expectation that every DoD organization will seek to continuously improve the processes by which their weapon systems are sustained in the field. The objective is to

- bring actual materiel readiness up to plan, or
- reduce the cost of readiness (as a component of total life-cycle cost), or both.

The fundamental approach used to provide for sustainment and modernization of key military equipment includes the Planning, Programming, Budgeting and Execution System (PPBE). The PPBE is a cyclic process containing three distinct but interrelated phases: planning, programming, and budgeting. In addition to establishing the framework and process for decision making on future programs, the PPBE process also examines prior decisions to analyze from the viewpoint of the current environment (threat, political, economic, technological, and resources). Through the PPBE process, decisions are evaluated and based on and consistent with a set of objectives, policies, priorities, and strategies derived from National Security Decision Directives. The ultimate objective of the PPBE is to provide the operational combatant commanders the best mix of forces, equipment, and support attainable within fiscal constraints. Throughout the PPBE process, the Office of the Secretary of Defense (OSD) provides centralized policy direction while placing program execution authority and responsibilities with Services. The Military Departments, Defense Agencies, and OSD Staff constantly monitor execution and adjust programs as necessary. The purpose of the PPBE is to produce a plan (National Military Strategy), a program (Program Objective Memorandum (POM)) and finally, a budget (DoD budget as part of the President's Budget) for the Department of Defense. All of these activities are focused on providing the essential sustainment and necessary modernization of key military equipment.

Below, we discuss three major strategies being pursued to ensure that military equipment is sustained in a manner that achieves planned readiness. Additionally, these strategies address the requirement to do so in a manner that optimizes sustainment value streams.

Continuous Process Improvement

CPI is being used by DoD organizations as a method to analyze how work is being done and how processes can be improved to do the job more efficiently and effectively on an ongoing basis. CPI has evolved for DoD into a comprehensive approach from separate performance improvement schools that originated in the private and public sectors. DoD organizations are currently using the following tools as part of a comprehensive CPI program aimed at achieving military equipment readiness:

- Lean, focuses on the removal of waste, defined as anything not necessary to produce the required product or service;
- Six Sigma, evolved from statistical quality control and total quality management focus upon satisfying customer expectations through reduction of process variation;
- Theory of Constraints, guides system improvement by concentrating on the process that slows the speed of product through the system.

In DoD's CPI program, the primary customers are the warfighters, and their readiness is the primary goal. Two important measures for meeting the warfighter's readiness needs are cycle time and reliability at an affordable cost.

Cycle time refers to the amount of time required for the DoD component to accept a current or future customer demand (normally the warfighter) and provide the requested capability. The objective is to align the organization and its processes to shorten the cycle time without adversely affecting the reliability and cost of the goods and or services. Cycle time improvements are focused on any process to reduce the time and resources involved. Reliability refers to the degree of certainty that a product or service (or any expected outcome) of a process will perform as intended over a set period of time under specified conditions.

In DoD's approach, CPI projects are considering cycle time and reliability improvements in the context of lowest total cost to deliver planned readiness to the warfighter. As previously mentioned, a comprehensive value stream focus is being employed to optimize CPI benefits within the DoD enterprise. The focus of DoD's CPI value stream approach is the customer and readiness. Individual CPI projects are being encouraged to address all of the related nodes, interfaces, and activities within the affected enterprise—as they center on measuring value to the warfighter.

Depot Maintenance Core Capabilities

While the general weapon system sustainment expectations communicated to program managers are "achieve and sustain planned materiel readiness objectives at minimum life-cycle cost" and "work to continuously improve your sustainment processes," a small number of overarching strategies are also imposed. These strategies, while not inconsiderate of life-cycle cost, are

driven instead by military risk; the risk that combat operations will be constrained due to insufficient, unsatisfactory or untimely delivery of weapon system sustainment products or services to the Warfighter. Chief among these overarching sustainment strategies is the establishment and preservation of critical core depot maintenance capabilities.

Core depot maintenance capabilities comprise government-owned, government-operated core logistics capabilities maintained at DoD maintenance depots. The capabilities are designed to provide a ready and controlled source of technical competence and resources necessary to ensure effective and timely response to a mobilization, national defense contingency situation, or other emergency requirement – and they are focused on key military equipment. DoD developed and employs a process to identify core logistics capability requirements, as well as the workloads necessary to sustain those capabilities. This process meets legislative requirements to identify and sustain core capabilities, and provides the DoD Components with guidance to assist them in sizing their capability requirements.

Condition-Based Maintenance Plus

Condition-Based Maintenance Plus (CBM+) is a DoD initiative that empowers the Services and their program managers to pursue and incorporate maintenance technologies and processes to more effectively support the warfighter – and ultimately provide improved sustainment support. CBM+ will improve system supportability, lead to more efficient business processes, and transform the maintenance environment for both new and legacy systems.

Many technologies and processes are included in the CBM+ initiative. The universally accepted condition-based maintenance concept, which establishes a need-driven approach to maintenance, forms the base for CBM+. The “Plus” designation represents the application and integration of maintenance improvements such as, reliability centered maintenance (RCM); failure trend analysis; serialized item management (SIM); enhanced diagnostics and prognostics techniques; electronic portable and point of maintenance aids; automatic identification technology (AIT); and data-driven interactive maintenance training. The ultimate goal of CBM+ is to improve maintenance agility and responsiveness, increase operational availability, and reduce total life cycle costs.

CBM+ represents a shift to a proactive approach in maintenance planning and execution. It leverages recent advancements in maintenance technologies and processes and is a conscious effort to shift from unscheduled corrective equipment maintenance to preventive and predictive approaches that schedule maintenance based upon the evidence of need. Using CBM+ tools and technologies, maintainers can identify and respond to deteriorating equipment conditions more effectively without having to wait for a failure. CBM+ not only emphasizes a different approach, but also allows a net reduction in the amount of maintenance performed, which affects all the associated logistics elements, including parts and other footprint factors. CBM+ is focused on determining the need for maintenance before operations are effected—and then being able to respond to that need quickly and effectively. Rather than a force multiplier, CBM+ is a “maintainer multiplier.” Maintainers are the key to the execution of equipment maintenance and they need to be well trained, well equipped, well informed, and well supported. CBM+ helps achieve those objectives.

Given on its relatively short history, CBM+ could be viewed as a "new requirement," but it actually represents a continuing evolution of maintenance processes and procedures that are based upon improved capabilities, practices, technologies, and techniques. As CBM+ is fielded on platforms and systems, DoD maintenance operations will be transformed with applications and business processes that make future operations more effective. CBM+ will link emerging maintenance and logistics requirements to the right resources in a timely and efficient manner. Maintenance and logistics systems will be synchronized to deliver and sustain unprecedented combat capabilities that are inherent in current and future weapon systems. Enabling the individual maintainer remains the key to success and CBM+ provides the best information, training, tools, and logistics support possible.

In summary, the current strategy for sustaining DoD weapon systems and equipment while bounded by general guidelines and suggested "best business practices", is unique to each supported item. Not only will no two weapon systems employ the exact same sustainment strategy, it is entirely probable that many of the sub-systems and components within the *same* weapon system will be supported using different strategies. Recognizing that all current sustainment strategies can benefit from rigorous performance-to-plan assessments and continuous process improvements, the Services have all undertaken aggressive CPI programs which the Department is actively supporting. Effective CPI programs not only enhance current strategies, they have the added effect of enabling a complete change in the strategy for sustaining a particular item or system; today's strategy for a given weapon may not be in place two years from now. All Service sustainment strategies however, will continue to comply with overarching DoD policies such as the Core depot maintenance policy. Except in-so-far as weapon system modernization priorities are established to enhance system capability, improve materiel readiness or reduce the cost of readiness (e.g., equipment reliability improvement initiatives), they fall outside the scope of this report.

SECTION 2 BUDGETARY INFORMATION

FUNDING

The funding to support the Department's sustainment and modernization strategies are included in the FY2007 President's Budget. The Department maintains an appropriate level of funding to minimize risk and sustain Warfighter capabilities within the constraints of Fiscal Guidance and competing requirements. Table 1 provides the funding from the FY2007 President's Budget to support the sustainment and modernization of 79 key military systems listed in Table 2.

Table 1. Sustainment and Modernization Funding

	Sustainment (\$B)	Modernization (\$B)
President's Budget 2007	18.9	17.6

RISK AND RISK MITIGATION

The Department is accepting some risk in sustainment and modernization strategies, while maximizing readiness in a fiscally constrained environment. The Department continues its transformation efforts while implementing BRAC and QDR initiatives in the FY 2007 President's Budget submission.

The President's Budget ensures the Department is able to achieve both near term operational needs and longer term goals of developing a mix of agile and flexible capabilities to mitigate uncertainty and maximize readiness. Funding levels below the President's Budget require a re-evaluation of Departmental risk, re-balancing available funding between near and longer term needs.

It is important to point out that the Department's CPI program is a major risk mitigation strategy. By focusing proven CPI techniques on cycle time and reliability within the sustainment value stream, we believe that process outputs will be substantially increased. In some cases, increased output may address the specific sustainment shortfalls discussed below. In general, we believe that CPI will lead to optimized sustainment value streams that provide substantially improved sustainment support.