

Office of the Secretary of Defense

REPORT TO CONGRESS

Department of Defense

Depot Maintenance Long-Term Strategy



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**Prepared by the
Deputy Under Secretary of Defense
(Logistics and Materiel Readiness)**

DoD Depot Maintenance Long-Term Strategy Report to Congress

Introduction

The Department of Defense is pleased to submit this report to the House and Senate Armed Services Committees. It outlines the steps being taken by the Department to develop a depot maintenance long-term strategy. The Department is engaged in a multiple-year transformation of its organizations and doctrine to better focus resources on the national security challenges of the 21st century. An integral part of this activity is an ongoing analysis of options for transforming DoD's support infrastructure. As such, DoD's long-term strategy for providing depot maintenance is still evolving, and is guided by the following:

- *Depot maintenance mission:* Sustain the operating forces with responsive depot-level maintenance, repair, and technical support—worldwide.
- *Depot maintenance vision:* Agile depot maintenance capabilities that are fully integrated into a warfighter-focused sustainment enterprise, supporting the full spectrum of operational environments.

This report summarizes the projected depot maintenance workload throughout the Future Years Defense Program (FYDP) planning horizon; the actions to develop and put into place strategies for maintaining requisite core logistics capability; and the array of techniques being used to revitalize the organic depot maintenance workforce.

The report is organized as follows:

- A DoD-wide overview of the
 - role of depot maintenance,
 - strategy for maintaining core logistics capability,
 - depot maintenance workload,
 - revitalization of the depot maintenance workforce, and
 - strategic planning environment
- A description of the vision, transformational strategy, approach to assuring core logistics capability, and workforce revitalization challenges of each Military Service.

Report Requirement

The *Report of the House of Representatives' Committee on Armed Services on the National Defense Authorization Act for Fiscal Year 2004* requests the Secretary of Defense to submit a report that addresses what steps are being taken to develop a long-term depot maintenance strategic plan.¹ This report is submitted in response to that request.

¹ House of Representative Report 108-106, May 16, 2003. Complete text of report request is provided in Appendix A.

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Section I—Overview

Introduction to Depot Maintenance

Depot-level maintenance entails materiel maintenance requiring the major repair, overhaul, or complete rebuilding of weapon systems, end items, parts, assemblies, and subassemblies; manufacture of parts; technical assistance; and testing.

The scope of depot maintenance ranges from the repair, modification, or overhaul of an entire weapon system (e.g., aircraft or ship), to the work done on assemblies (e.g., engine), down to the repair of subassemblies (e.g., engine blades). Corrosion control and structural rehabilitation are critical activities at maintenance depots, particularly with weapon systems that have been exposed to corrosive elements and severe operating conditions for extended periods. Depot maintenance also encompasses the installation of modifications to extend the operational life of weapon systems or improve their performance.

Role of Depot Maintenance in Overall Materiel Maintenance

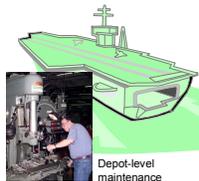
The U.S. military is the most equipment-intensive military force in the world. Keeping complex weapon systems and their components in top operating condition requires extensive maintenance at scheduled intervals and expeditious repair when failures occur. Equipment maintenance concepts in DoD typically employ three levels of maintenance:



- ◆ Organizational maintenance consists of the on-equipment tasks necessary for day-to-day operation, including inspection and servicing and remove-and-replace operations for failed components (includes so-called line replaceable units or weapon replaceable assemblies).



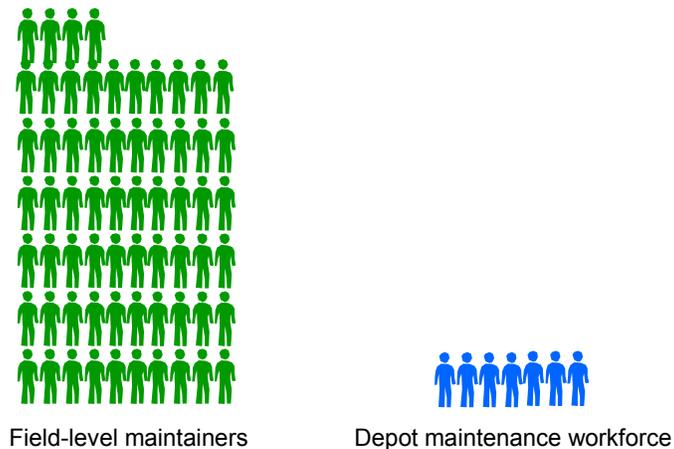
- ◆ Intermediate maintenance consists of off-equipment repair capabilities possessed by operating units and in-theater sustainment organizations. These capabilities can be quite extensive, and include remove-and-replace operations for subcomponents of line replaceable units (so-called shop replaceable units or assemblies), local manufacture, and other repair capabilities.



- ◆ Depot maintenance consists of all repairs beyond the capabilities of the operating units, including rebuild, overhaul, and extensive modification of equipment platforms, systems, and subsystems. The depot level is the ultimate source of repair.

As a consequence of the United States' extensive arsenal of weapons and equipment, about one-fourth of all military personnel are equipment maintainers. On the other hand, as Figure I-1 shows, the size of DoD's (overwhelmingly civilian) depot maintenance workforce is one-ninth that of DoD's (mostly military) field-level maintainers.¹

Figure I-1. Relative Size of Depot Maintenance Workforce and Field-Level Maintainers



Where Depot Maintenance Is Performed

The depot-level repair and overhaul of DoD's weapon systems, equipment, and other materiel occurs in depots owned and operated by the Military Services and at industrial sites operated by contractors. In addition, maintenance depots deploy field teams that conduct depot-level inspections, repairs, battle damage reclamation, and installation of modifications to weapon systems and components at operational locations throughout the world. In FY2003, 53 percent of all depot maintenance expenditures were for work performed by organic depots.

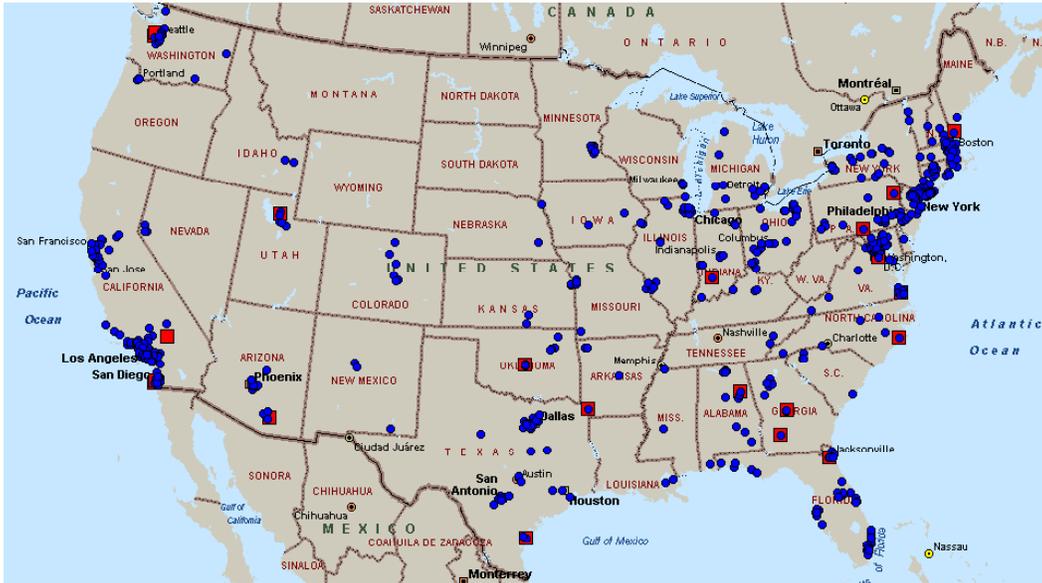
Depot maintenance of DoD weapon systems, equipment, and other materiel occurs in 45 states. The red squares in Figure I-2 denote the location of DoD's 20 major depot maintenance activities.² Contractor-performed depot maintenance (indicated by the blue dots in Figure I-2) is widely dispersed throughout 450 communities. Depot maintenance occurs in 145 of the 362 U.S. metropolitan areas.³

¹ Field-level maintenance is composed of organizational and intermediate maintenance.

² Although not shown, organic and contractor-performed depot maintenance occur in Hawaii.

³ A metropolitan area, as defined by the Office of Management and Budget, must have at least one urbanized area of 50,000 or more inhabitants.

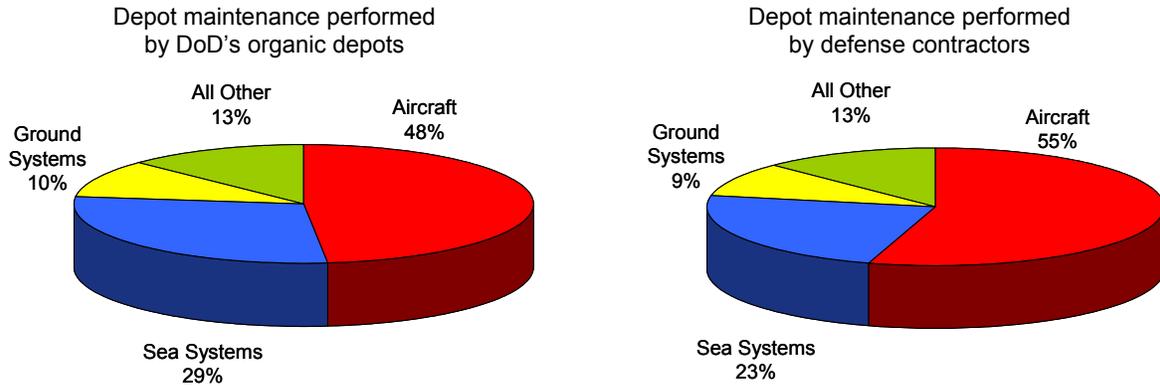
Figure I-2. Depot Maintenance Locations



Depot Maintenance at a Glance

Aircraft-related commodities (e.g., airframes, engines, and aircraft components) account for about one-half of all depot-level maintenance and repair expenditures. Ships, submarines, and their associated systems (i.e., sea systems) are the second largest commodity group. Together, these two commodity groups account for about three-quarters of all depot maintenance expenditures. Figure I-3 portrays the distribution by major commodity group for depot maintenance performed by DoD’s depots and by defense contractors.

Figure I-3. Depot Maintenance by Major Commodity Groups



Strategy for Maintaining Core Logistics Capability

National policy, as articulated in 10 U.S.C. 2464, stipulates the following:

- The Department of Defense must maintain a core logistics capability that is government-owned and -operated to maintain and repair the weapon systems and other military equipment necessary for the armed forces to fulfill the strategic and contingency plans of the Department.
- Sufficient workload must be assigned to government-owned and -operated facilities to ensure cost efficiency and technical competence in peacetime while preserving necessary surge and reconstitution capabilities.

Computing Core

The Department of Defense first articulated a conceptual depot maintenance core-sizing method in 1993. This method was updated and substantially expanded in 1996. It is designed to determine which depot maintenance capabilities should be maintained in organic depots to meet the readiness and sustainability requirements for the weapon systems that support contingency scenarios of the Joint Chiefs of Staff (JCSs). Depot maintenance core sizing involves a determination of the skills, facilities, and equipment needed to achieve the requisite capabilities, as well as the associated workload to sustain these requirements.

The Deputy Under Secretary of Defense for Logistics and Materiel Readiness (DUSD[L&MR]) issued an updated depot maintenance core policy and core-sizing methodology in November 2003. This new guidance (which was the culmination of several years of analysis and deliberation) rectifies instances of incomplete or unclear policy to ensure compliance with statutory guidance, incorporates contemporary business practices, and is intended to eliminate inconsistent implementation among Service depot maintenance activities.

Table I-1 provides the Services' current computations of core capability requirements based on the November 2003 guidance and methodology.

Table I-1. Depot Maintenance Core Capability Requirement—in Direct Labor Hours (in millions)

Service	Labor Hours
Army	14.5
Navy	36.2
Marine Corps	1.5
Air Force	21.4
DoD total	73.6

Performance-Based Logistics

The Department of Defense has adopted Performance-Based Logistics (PBL) as the preferred approach to providing product support for military materiel. The PBL approach is enabling DoD to compress the supply chain, reduce the logistics footprint, and improve readiness for major weapon systems and commodities.

One of the salient differences between PBL and DoD's traditional approach to weapon system sustainment is the establishment of single-point direct accountability for a weapon system's life-cycle product support. The designated support integrator can be the original equipment manufacturer, a systems integration contractor, or a DoD engineering or logistics activity.

PBL is not an alternative to maintaining core logistics capability. DoD acquisition policy⁴ requires program managers to ensure sustainment strategies include the best use of public- and private-sector capabilities through government-industry partnering initiatives and in accordance with statutory requirements. Depot maintenance public-private partnerships (PPPs) are an integral part of a growing number of PBL arrangements.

Public-Private Partnerships

Congress has enacted legislation that enables DoD's maintenance depots to enter into partnership agreements with commercial and defense sector firms. Depot maintenance partnerships attract workload (in addition to work associated with PBL arrangements), which contributes to sustaining the organic depots' core capabilities.

A public-private partnership for depot maintenance is an agreement between an organic depot maintenance activity and one or more private industry or other entity to perform work or utilize facilities and equipment. Depot capabilities that can be covered by such agreements include

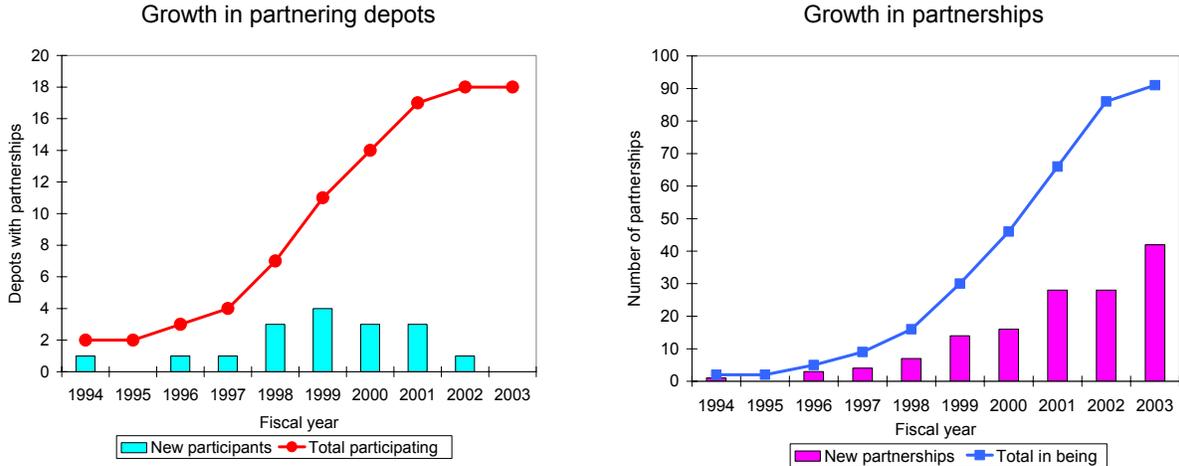
- manufacturing (e.g., fabrication of parts, assembly of components, and final assembly and painting of end-use items);
- repair (e.g., diagnostics, refurbishment, overhaul and rebuild); and
- technical services (e.g., testing and analysis, and repair process design, and in-service engineering).

Depots are steadily increasing their use of these authorities. As Figure I-4 illustrates, where there were only two depot maintenance partnerships a decade ago, now 18 major DoD depot maintenance activities have at least one partnership—with more than 90 partnerships in effect at the end of FY2003.⁵

⁴ DoD Directive 5000.1, *The Defense Acquisition System*, May 12, 2003.

⁵ Fifty-three partnership arrangements were completed during FY2001–FY2003.

Figure I-4. Growth in Depot Maintenance Partnering



Depot Maintenance Workload

Depot Maintenance Expenditures

Maintaining the large DoD inventory of complex weapon systems and equipment requires considerable expenditure of resources. Depot-level maintenance and repair consumes roughly 5 percent of DoD’s annual obligational authority. Table I-2 depicts the estimated FY2002–FY2005 depot maintenance expenditures of the Military Services and Special Operations Command (SOCOM), including funds for depot maintenance interim contractor support (ICS) and contractor logistics support (CLS). The data in Table I-2 are presented from the customer’s perspective (that is, the DoD component responsible for obtaining depot maintenance support of its assigned equipment from a variety of performing activities, which may include a Service’s depots or those of other Services and contractors).

Table I-2. Annual Depot Maintenance Expenditures—Obligational Authority (then year dollars in millions)

Service	FY2002	FY2003	FY2004	FY2005
Army	\$2,737	\$3,448	\$4,811	\$4,217
Navy	\$9,439	\$11,024	\$8,779	\$9,247
Air Force	\$8,299	\$9,614	\$10,213	\$10,222
Marine Corps	\$261	\$382	\$249	\$190
SOCOM	\$215	\$296	\$250	\$248
Total	\$20,952	\$24,764	\$24,302	\$24,124

Note: FY2002 and FY2003 data depict funds that were obligated by the Military Services and SOCOM for depot-level maintenance and repair. Data for FY2004–FY2005 project expenditures based on the FY2005 President’s Budget submission.

The mix of depot maintenance workload between the public and private sectors is expected to remain roughly the same as recent experience indicates (i.e., DoD depots will accomplish about 53–55 percent of the total workload).

Public Sector Workload

Table I-3 shows the FY2002–FY2009 organic workload trend in direct labor hours (DLHs) from the perspective of the agent Service (i.e., the organizational activity that supports depot-level maintenance for a variety of customers, which may include its Service, other Services, and other federal agencies). The significant increase in organic workload between FY2002 and FY2004 reflects the effect of the ongoing Global War on Terrorism.

Table I-3. Organic Depot Maintenance Workload—Direct Labor Hours (in millions)

Service	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009
Army	11.79	13.56	16.28	16.35	16.45	16.39	16.39	16.39
Navy	46.24	46.70	51.03	49.48	49.57	49.25	47.50	44.80
NAVSEA	33.41	33.35	37.61	36.65	36.74	36.44	34.69	31.99
NAVAIR	12.44	12.93	13.03	12.43	12.43	12.43	12.43	12.43
SPAWAR	0.39	0.42	0.38	0.40	0.40	0.38	0.38	0.38
Air Force	24.77	24.46	26.33	25.05	25.19	25.17	25.18	25.18
Marine Corps	1.82	1.80	2.02	1.76	1.76	1.76	1.76	1.76
DoD total	84.62	86.52	95.66	92.64	92.97	92.57	90.83	88.14

Notes: NAVAIR (Naval Air Systems Command), NAVSEA (Naval Sea Systems Command), and SPAWAR (Space and Naval Warfare Systems Command) totals are subsets of the Navy total. Due to rounding, figures may not add exactly.

Revitalizing the Depot Maintenance Workforce

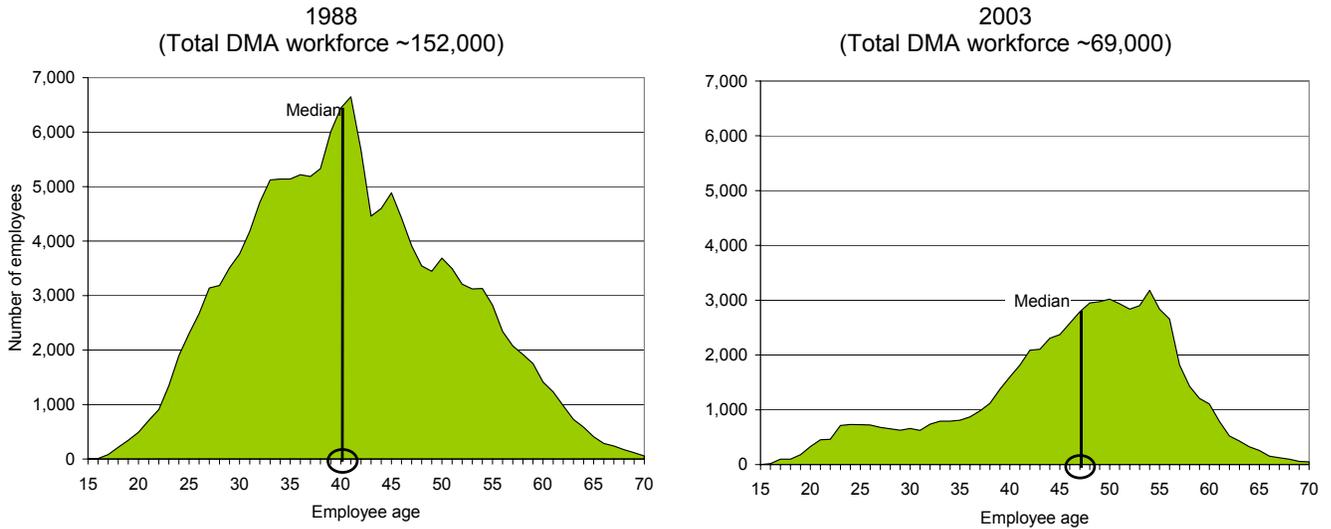
At the end of the Cold War in 1988, the Military Services operated 35 major depot maintenance activities⁶ in the United States. Since that time, 15 organic depot maintenance activities have been closed through the base realignment and closure (BRAC) process, and the overall size of the organic depot maintenance workforce has declined by 55 percent.

Demographic Shifts

The downsizing of the depot maintenance workforce was largely accomplished through retirement and separation incentives; however, a disproportionate number of younger employees were separated due to lack of seniority, and hiring of new employees was significantly reduced for several years. As a result, the median age of the depot maintenance civilian workforce increased from 40 years (in FY1988) to 47 years (in FY2003), as illustrated in Figure I-5. The largest concentration of employees shifted from 38–42 years of age in FY1988 to the 50–55 year range in FY2003. This shift does not connote a crisis, but it does have workforce replenishment implications.

⁶ Major depot maintenance activities employ at least 400 people.

Figure I-5. Comparative Age Profiles of DoD Depot Maintenance Employees



The aging that accompanied the downsizing of the depot maintenance workforce had a beneficial effect on the aggregate experience level. As Figure I-6 illustrates, the median years of service (YOS) increased from about 13 (in FY1988) to 20 (in FY2003). The FY2003 profile also indicates the depots hired relatively large numbers of new employees in recent years, both to replace retiring employees and to accommodate increases in workload.

Figure I-6. Comparative Years of Service Profiles for Depot Maintenance Employees

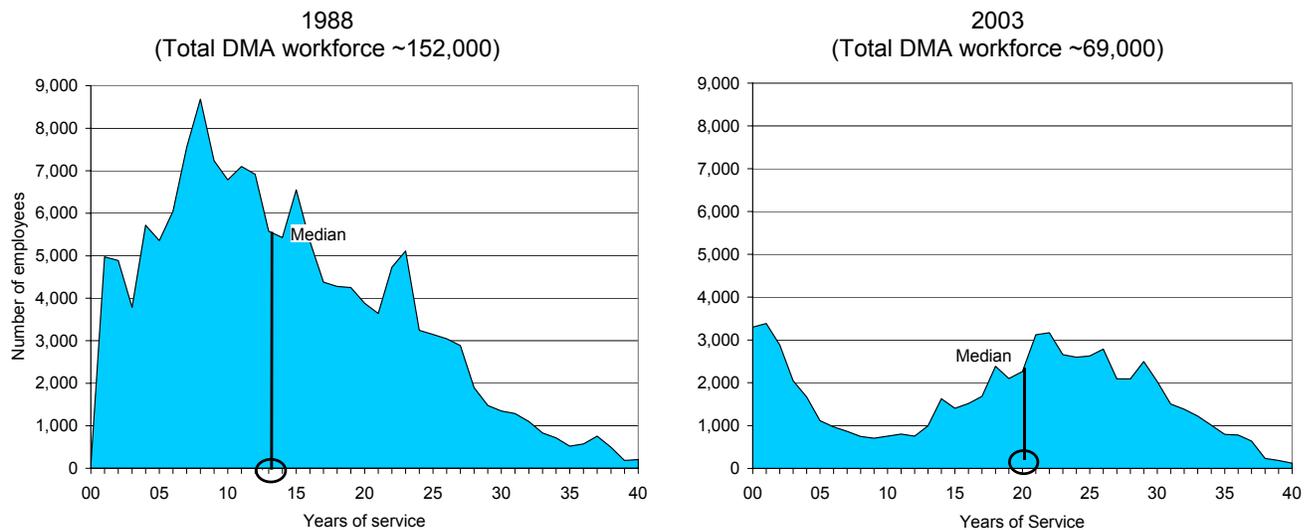
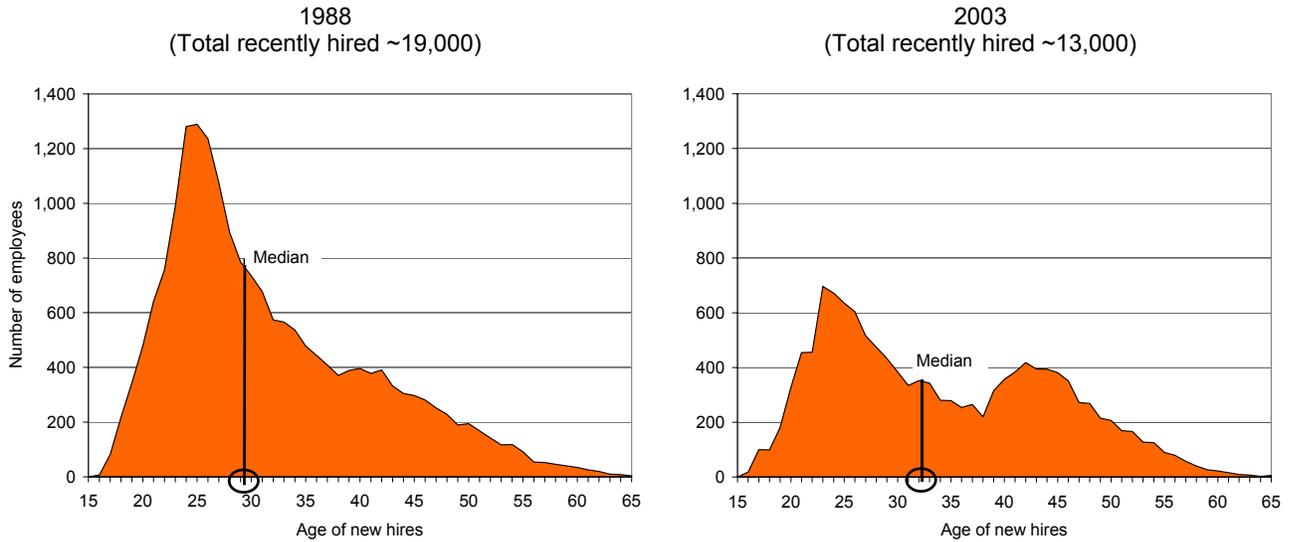


Figure I-7 compares the age profiles for recently hired personnel in FY1988 and FY2003. The age profile for FY1988 reflects the conventional wisdom that the preponderance of new government employees are hired in their teens and twenties. By 2003, however, a substantially different hiring pattern had emerged—about one-third of recently hired employees were 35–45 years old when hired. This phenomenon demonstrates the successful efforts of many of the depots to recruit skilled artisans, as well as, entry-level workers.

Figure I-7. Age Profile for Recently Hired Depot Maintenance Employees



Impact of Expected Retirement Patterns

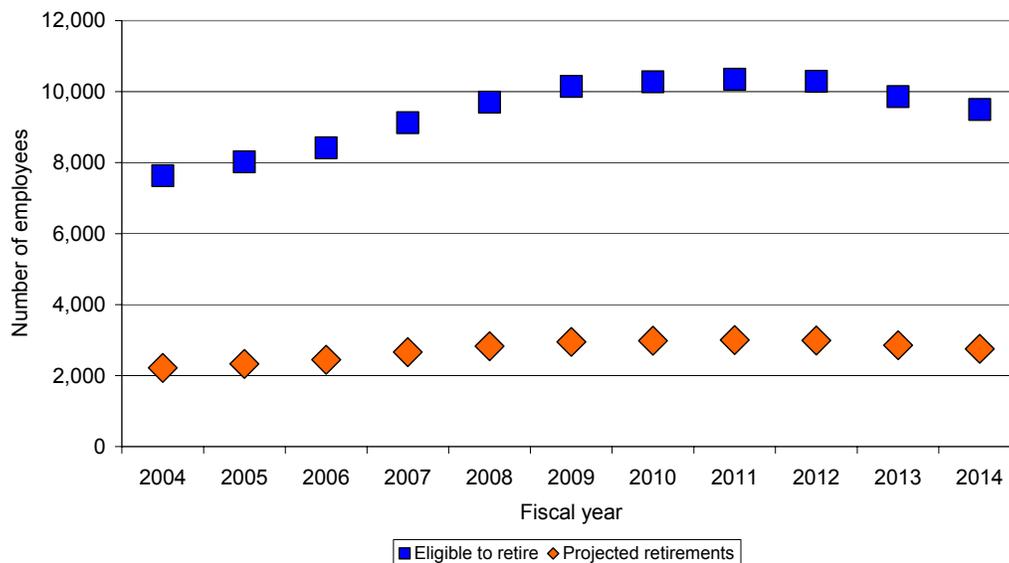
The aging of the depot maintenance workforce, as depicted in Figure I-5, has led to a significant increase in the portion of the depot maintenance workforce that is eligible for retirement. At the end of FY2003, the number of retirement-eligible depot maintenance employees approached the FY1988 level, even though the size of the depot maintenance workforce had been reduced by 55 percent. In other words, the retirement-eligible segment increased from about 5 percent of the total depot maintenance workforce in FY1988 to more than 10 percent of the total depot maintenance workforce in FY2003.

Federal employees typically do not retire immediately upon becoming eligible. Typically about 25 percent of DoD employees retire within 1 year of retirement eligibility. On the other hand, approximately 60 percent retire within 4 years of retirement eligibility.

The retirement-eligible population within the depot maintenance workforce, and forecast annual retirements, are expected to increase annually for the remainder of this decade, as illustrated in Figure I-8. This projection assumes the overall size of the depot maintenance workforce remains relatively stable and historical retirement rates will continue in the future.⁷

⁷ Workforce replenishment planning also anticipates retention patterns for employees covered by Federal Employee Retirement System (FERS)—whose retirement benefits are fully portable—will be similar to that experienced over the past decade.

**Figure I-8. Depot Maintenance Workforce
Forecast Retirement Eligible Population and Annual Retirements**



Retirement eligibility profiles differ among the Services due to disparate hiring and retention patterns associated with past workload trends at the various depots. Projected annual retirement losses range from 3 to 6 percent of each Service’s depot maintenance workforce.

Depot Maintenance Workforce Management

DoD’s depot maintenance community is acutely aware of the potential ramifications of replacing retirement-eligible personnel, and strategies have been developed for dealing with impending losses. No single strategy will work for all depots because of the differences among them in demographic profiles, occupational composition, and regional labor pool conditions. The following are examples of the various techniques that are being used by maintenance depots to acquire new employees with requisite skills and abilities:

- Hiring of skilled technicians based on projected workforce attrition over the next 12 months
- Vocational education partnerships with local high schools and regional technical schools, also known as youth apprenticeship programs
- Development of an on-site factory-like training facility in which depot employees provide technical training, and state-certified educators provide related job skills training
- Cooperative education programs with colleges and universities that offer engineering degrees
- Maintenance Production Specialist internships, which combine classroom, on-the-job training (OJT), and structured job assignments tailored to develop mid-level managers
- Active recruiting of non-commissioned and warrant officers nearing retirement
- Nationwide recruiting for hard-to-attract specialties, such as information technology or vanishing skills, such as pattern making.

Depots are also using the following strategies to mitigate the impact of workload fluctuations caused by evolving military operations:

- Hiring new workers as temporary employees, then converting them to permanent employees as justified by the workload
- Establishing and maintaining a pool of seasonal employees (i.e., people with requisite skills who are interested in periodic temporary employment)
- Sharing the depot workforce with private-sector firms through depot maintenance partnerships that permit movement of employees between facilities as necessary to accommodate workload surges
- Broadening the range of tasks that employees are certified to perform.

In addition, DoD has recently established a Defense Applicant Assistance Office (DAAO). This organization is charged with fostering the marketing of job opportunities in the department, managing the Recruitment on Campus (ROC) program, and providing career advisors who can assist prospective employees in navigating the job application process. DAAO also sponsors the *Civilians Working for National Defense* website, <www.go-defense.com>, which features a “Search for Jobs” hot button.

Strategic Planning Environment

Mandate for Transformation

The threats the United States faces today are notably different than those of the Cold War era, DoD consequently has adopted a new defense strategy that focuses on the national security challenges of the 21st century. This strategy requires transformed forces that can take action from a forward position and, when rapidly reinforced from other areas, defeat adversaries swiftly and decisively while actively defending U.S. territory.

The United States must transform its armed forces to be agile, flexible, and light, so they can respond quickly and deal with surprise. This agility and flexibility must also become the culture and cornerstone of the processes that provide support to U.S. forces. Transformation of the U.S. defense establishment over time is at the heart of the new defense strategy.

Logistics Transformation

Logistics capabilities must be able to support future joint forces that are fully integrated, expeditionary, adaptable, capable of decision superiority, and increasingly lethal. The Military Services, in conjunction with the combatant commands, all have initiatives underway to transform various aspects of logistics for the future. In general terms, the initiatives are designed to

- make logistics sustainment processes more agile and responsive;
- provide more timely and precise delivery of essential support to the warfighter;
- require less “footprint” in deployed operations; and
- be network-centric, connecting the field logistician with the wholesale levels to provide seamless responsiveness from wherever support capabilities are located.

The transformed depot maintenance establishment of the future is already taking shape in three fundamental areas:

- Depot maintenance is increasingly and directly tied to operational demands, and the primary focus of the depots is centered increasingly on satisfying operator needs, not demands for serviceable stock. Both contract and organic sources of repair are more directly involved with the operator, and both have to be far more flexible and responsive than they traditionally have been to directly support mission accomplishment.
- Depot maintenance increasingly reflects the organization of the operating forces. Depot field teams (contract and organic) are directly associated with many operating units, and the proliferation of these depot teams will only continue. Beyond public-private partnering, there is anecdotal evidence that contract and organic providers are working together in new ways in the depots and on the battlefield.
- Depot maintenance operations are becoming leaner and more integrated with the wholesale logistics enterprise. The organic depots are implementing enterprise resource planning (ERP) systems, while contractors are providing PBL sustainment that incorporates depot maintenance.

A fundamental cornerstone of DoD’s efforts to make maintenance, repair, and overhaul operations leaner and more responsive to operational demands at all levels of maintenance is “Lean Thinking.” Modeled after the just-in-time and “Lean” manufacturing techniques pioneered by the Toyota Motor Company over the past 30 years and espoused in *Lean Thinking*,⁸ “Lean” tools and techniques are used at all levels of the DoD maintenance community, both by organic units and commercial firms providing maintenance support. The results so far have been impressive. When properly applied, these techniques have helped maintenance providers achieve significant reductions in repair cycle time and improvements in productivity. These results have been achieved with lower inventories and lower costs.

⁸ James Womack and Daniel Jones, *Lean Thinking*, Simon and Schuster (New York, 1996).

Depot Maintenance Mission and Vision

In light of ongoing analyses of options for transforming DoD's support infrastructure, and evolving ramifications of the mandate for change, DoD's long-term strategy for providing depot maintenance is still evolving. Nevertheless, the following common mission and vision guide the Service's strategic planning efforts:

- *Depot maintenance mission:* Sustain the operating forces with responsive depot-level maintenance, repair, and technical support—worldwide.
- *Depot maintenance vision:* Agile depot maintenance capabilities that are fully integrated into a warfighter-focused sustainment enterprise, supporting the full spectrum of operational environments.

The sections that follow provide a description of the vision, transformational strategy, approach to assuring core logistics capability, and workforce revitalization challenges of each of the Military Services.

Section II—Army

The Army of tomorrow must be more lethal, versatile, agile, survivable, maneuverable, and sustainable in order to successfully conduct its global mission. To meet these new demands, the United States Army is undergoing the largest and most comprehensive transformation in its history. To support the sustainment and readiness needs of a transforming Army, it is necessary to maintain a Depot Maintenance Enterprise that is modern, reliable, cost effective, and highly responsive in both peacetime and war.

The Army is committed to establishing an effective and efficient Depot Maintenance Enterprise while providing depot maintenance products and services at competitive prices to all customers. The Army's strategy to achieve this objective requires enhancing productivity, improving business practices, and integrating innovative business processes. The Army must also remain dedicated to the readiness of the warfighter by providing a full worldwide complement of sustainment and readiness products and services. The Army's long-term depot maintenance strategy includes the implementation of transformation enablers, such as "Lean Manufacturing," partnerships with the private sector, Performance-Based Logistics, adherence to all statutory requirements, and development of a comprehensive Capital Investment Program (CIP) that enhances core depot capabilities to meet current and future weapon system logistics support requirements.

Depot Maintenance Vision and Mission

Vision

The Army's vision for its Depot Maintenance Enterprise is to provide modern, responsive, and effective depot-level maintenance capabilities, nationally and forward-deployed, that ensure flexible and focused support to the warfighter.

This vision requires the Army to achieve the following strategic objectives:

- Continue to improve production capacity, effectiveness, cost efficiency, and responsiveness in maintenance support to the soldier and the joint team.
- Optimize collaborative activities and partnerships with the private sector and with defense agencies and services to leverage technology and capital investments, and to provide best value support to our joint, interagency, and multinational team customers.
- Implement knowledge management and integrate information technology improvements and solutions to connect decision makers at every level to address current and future programs, production, and capabilities in near real time.

- Recruit, train, and retain dedicated and innovative people who lead the application of relevant technologies and sustainment processes, including expanded capabilities in Army depot maintenance “reach back” and forward-deployed capabilities in direct support of the joint, interagency, and multinational teams.
- Serve as an Army “integrating” capability for the Future Force in on-going weapon system recapitalization and Global War on Terrorism (GWOT) reset/refit activities, and in planning for the future of the depot maintenance industrial base.

Progress toward achieving the Army’s Depot Maintenance Enterprise vision and strategic objectives will be influenced by the Army’s success in managing the following challenges:

- Insertion of advanced technologies in both legacy and new weapon systems to meet the needs of a transforming Army
- Competition for limited resources as the Army focuses on meeting the readiness needs of the national security mission, including GWOT
- Changes in force structure
- Restrictive legislation, regulations, and policies
- Total life-cycle management of weapon systems.

Mission

The mission of the Army Depot Maintenance Enterprise is to provide the Army and other armed forces worldwide reliable, responsive, and cost-effective overhaul, rebuild, upgrade, repair, manufacturing, technical support, systems integration, and product support integration for weapon system end items, assemblies, sub-assemblies, components, and ancillary equipment to ensure the readiness, sustainability, and safety of these forces during the full spectrum of operational environments.

To fulfill its mission, the Army Depot Maintenance Enterprise will employ a complementary and synergistic mix of government and private-sector capabilities. It will be a multipurpose and multiuse organization that is structured to provide the required capabilities and capacity to satisfy peacetime and wartime reconstitution and readiness needs. The challenge for the Army is to determine the most efficient organic capability and capacity to support the full spectrum of core technology and logistics capability requirements for both legacy and new weapon systems.

Included in the Depot Maintenance Enterprise are the five organic maintenance depots under the command and control of the U.S. Army Materiel Command (USAMC), its major subordinate commands (MSCs), their forward repair activities (FRAs), the Army National Guard (ARNG) readiness sustainment maintenance sites (RSMSs), and aviation classification repair activity depots (AVCRADs), the U.S. Army Test Measurement and Diagnostic Equipment (TMDE) Activity (USATA), and other certified and validated sources of repair, both public and private.

The Army's Depot Maintenance Enterprise mission requires efficient and responsive depot maintenance activities that collectively provide a full range of life-cycle support products and services, including the following:

- *Overhaul, rebuild, upgrade, and repair*—a full range of maintenance support services, including overhaul, rebuild, modification, conversion, repair, and testing
- *Manufacturing*—total system and component manufacturing from prototyping to full installation, including engineering, machining, sheet metal, welding, finishing, plating, painting, cable manufacturing, as well as mechanical, electrical, and electronic assembly
- *Technical assistance*—worldwide technical assistance, system fielding, and depot maintenance support, including the deployment of activities (such as USAMC's Logistics Support Element [LSE]) to support contingency operations (such as Operation Enduring Freedom [OEF] and Operation Iraqi Freedom [OIF]) and natural disaster relief missions
- *Systems integration*—capabilities that typically include development of new prototype systems or downsizing of existing systems¹
- *Product support integration*—public- and private-sector depot activities can compete for selection as a system product support integrator (PSI) under a performance-based agreement (PBA).²

Transformation Strategy

The Army is transforming its forces to become lighter, more adaptable, deployable, and versatile to meet the threats the United States will face in the 21st century. As such, the Army logistics enterprise has the critical task of ensuring Army forces are capable of rapidly deploying in support of current or future operational force and deployment goals, as well as effectively sustaining the full spectrum of Army operations. The Army logistics transformation goal is to enhance strategic responsiveness by meeting deployment timelines, reduce the combat service support footprint in the combat zone, and lessen the cost of generating and sustaining forces without reducing warfighting capability and readiness. To achieve this goal, the Army is implementing a total system approach to logistics transformation. The Army Depot Maintenance Enterprise has embraced this transformation, with the following transformation enablers taking shape to support it:

- Lean Manufacturing
- Performance-Based Logistics
- Public-private partnerships
- Depot Capital Investment Program Plan.

¹ Both public- and private-sector depot maintenance providers will work closely with the customer throughout the systems integration process, often developing complete drawing packages and technical data packages, and providing fielding support and new equipment training. After fielding, both public and private-sector depot activities are capable of supporting the system through its life cycle, including modifications and upgrades.

² PSI-coordinated activities can include functions provided by organic organizations, private-sector providers, or a partnership between organic and private-sector providers. Activity examples include coordinating with operational units to obtain data and measure system fleet operational availability; co-chairing the Supportability Integrated Product Team (SIPT) and other meetings; monitoring the performance of product support providers (PSPs) to ensure they meet established performance metrics; and coordinating system-level metrics with the warfighter.

Lean Manufacturing

”Lean” strategies cut costs while shortening production lead-times and time-to-market, improve quality, and provide customers with exactly what they want, precisely when they want it. The application of ”Lean” techniques by way of dedicated product teams makes it possible to design, order, produce, and deliver goods at smaller production scales without incurring scale or investment penalties. It is the goal of the Army’s ”Lean” initiatives to reduce the time needed to develop and deliver new technology into the hands of soldiers, and to ensure warfighters have enough of what they need, when they need it.

“Lean Manufacturing” refers to an evolving dynamic new process of production that covers the total enterprise, embraces all aspects of industrial operations (product development, manufacturing, organization and human resources, and customer support), and includes customer-supplier networks that are governed by a systemic set of principles, methods, and practices. Perfect first-time quality, waste minimization through the removal of all activities that do not add value, continuous improvement, flexibility, and long-term relationships are among the ”Lean” principles.

Under the direction of USAMC, the Army’s depots have aggressively incorporated ”Lean” thinking into all aspects of depot operations, training more than 150 employees at each depot, and creating a business strategy that focuses on operational excellence as measured by products with sustained quality that are delivered on time, at or below cost.

Anniston Army Depot (ANAD) began its first ”Lean Manufacturing” effort on the Air Cooled, V-engine configuration, Diesel, Super Turbocharged (AVDS) 1790 Reciprocating Engine—the engine used in main battle tanks before the M1 tank. After this initiative increased AVDS 1790 engine productivity by 30 percent and reduced turnaround time by 50 percent, ANAD focused on the M1 Abrams Tank turbine engine process, and achieved similar results.

Corpus Christi Army Depot (CCAD) employees improved the efficiency of the overhaul line for the Black Hawk/Apache—series airframe T700 engine by partnering with General Electric Corporation for training and to expedite parts’ availability. CCAD was able to reduce the turnaround time for overhauling the T700 engine from 261 days to 180 days; and CCAD’s goal is to reduce turnaround time to 100 days by 2005. Modifications in the engine overhaul process increased performance in shaft horsepower by 43 percent and increased mean time-between-removal from 483 hours to 1,120 hours, which translates to an 80 percent reduction in the not-mission-capable-due-to-supply (NMCS) rate. This led to further reductions in operating and support costs, soldier workload, and the burden on Army training, maintenance, and supply systems.

An analysis of the Patriot Missile System at Letterkenny Army Depot (LEAD) identified opportunities to improve turnaround time and reduce shop floor space for each major subsystem, including the Launcher, Radar, Antenna Mast Group; Engagement Control Station; and Information Coordination Center. Results to date have reduced turnaround time by an average of 30 percent and reduced floor space by an average of 36 percent for each major subsystem.

Red River Army Depot (RRAD) established a Lean Team to focus on the production line to refurbish the Small Emplacement Excavator (SEE). The RRAD Lean Team broke down the axle production line into four workstations, placing parts, tools, and technical data within easy reach of the operator and implementing a standard and one-piece workflow by moving the brake disk

turning equipment to the axle line area, installing the paint booth near the axle line to reduce travel time between workstations, and moving the wash system closer to the workstation using it. The workforce saw immediate results, making their work significantly more efficient. RRAD also initiated "Lean" implementation on the Cummins 903 engine assembly used by both the M2/M3 Bradley Fighting Vehicle (BFV) and the M270 Multiple Launch Rocket System (MLRS). RRAD saved \$2 million by converting the previous batch engine assembly lines into a single line.

Tobyhanna Army Depot (TYAD) established a Lean Core Team to implement "Lean" concepts throughout the depot. The TYAD team identified a design problem³ with the power supply in the Apache helicopter video display unit for navigational and weapons information, which cost more than \$10,000 to replace. To correct the problem, TYAD engineers designed a more effective and efficient unit that reduced the total replacement cost to \$1,500 and increased a mean-time-between-failure (MTBF) of 100,000 hours, saving the Army an estimated \$1.3 million per year. TYAD also analyzed three product lines: the Sidewinder's missile guidance and control assembly (a critical Air Force program for OEF/OIF), the AN/TRC-170 Tropospheric Microwave Radio Terminal, and the AN/TPQ-36 Firefinder Radar System. These three "Lean" initiatives have reduced turnaround time and customer costs for each product line.

Public-Private Partnerships

Expanding the number of PPPs with private industry at the Army's five maintenance depots is a key element of the Army's depot maintenance strategic plan. The Army depots have steadily increased the number of PPP agreements, with a total of 42 active and 23 completed partnerships as of the end of FY 2003. Both public and private depot-level entities possess complementary capabilities that, when effectively integrated, offer the best value life cycle support to Army warfighters. PPPs that share investment costs, promote the dual use and transfer of start-up equipment, or provide for the joint-use of facilities offer potential areas for overall cost reduction.

Army policy specifies that partnering must be addressed early in the acquisition development process for all types of sustainment acquisition. It further states that partnering is a required element in the Single Acquisition Management Plan (SAMP) and will be addressed prior to the key Milestone "C" decision or before the release of solicitation or request for proposal (RFP) for system development and demonstration. Partnering arrangements ensure an organic Army depot provides at least part of the depot maintenance support identified by the program executive officer (PEO) or program manager (PM) for core logistics capability requirements. Non-core candidate technologies are also available for partnering.

Performance-Based Logistics

The Army has adopted PBL as the preferred approach for providing product support for Army materiel. PBL is not viewed as an alternative but as an enabler for sustaining core logistics capability requirements through public-private partnerships between the organic depots and private-sector contractors. Consequently, depot maintenance public-private partnerships have become an integral part of a growing number of PBL arrangements within the Army.

³ A flaw that was causing supply and readiness problems for Apache units throughout the Army.

Depot Capital Investment Program Plan

The Depot CIP Plan comprises the financing, acquisition, development, and implementation of permanent improvements to the five organic maintenance depots fixed assets. The goal of CIP is to identify a long-range, stable capital needs strategy that considers the depot customer rates, depot competitiveness, and proper cost allocation. The Army also considers future depot core logistics capabilities and competencies, the components of current and future weapon systems, and the current state of existing facilities and infrastructure. Thus, the CIP Plan is a comprehensive, 16-year plan for the modernization or replacement of depot facilities and infrastructure, and consists of each depot's capital improvement requirements and the projected funding or expenditures.

Through the CIP Plan, the Army is ensuring the modernization of its maintenance depots to meet future requirements as part of the Army's overall transformation strategy. The program executive offices (PEOs) and program management offices (PMOs), together with the USAMC depots, will continue to identify and develop immediate and long-range capital investment plans that keep pace with changes in technology and force structure.

Strategy for Maintaining Core Logistics Capability

To comply with 10 U.S.C. 2464 (the "core logistics statute"), the Army remains committed to following DoD's core policy and methodology. Current DoD guidance includes a decision-tree flow process that sizes workload capability requirements in the number of direct labor hours associated with the depot-level repair of weapon systems and components critical to the contingency scenarios of the Joint Chiefs of Staff, and assesses the ability of the existing organic base to support these requirement through the identification of the proper skill mix, equipment, and facilities.

The identification of core logistics capability requirements is the process through which Army PEOs and PMs of new and modified systems integrate product support strategies with Army-level depot maintenance strategies. The USAMC MSCs and maintenance depots are working closely with the applicable PEOs/PMs to obtain core capability requirements for both current and future weapon systems and to provide assistance as required.

The Army's depot maintenance core requirement for FY2005 is 14.5 million direct labor hours, which is approximately 3.6 million more DLHs than the Army's last core calculation in FY2000. This increase is primarily attributable to additional tactical wheeled vehicle maintenance and repair requirements at Red River Army Depot and additional combat vehicle and small arms core requirements at Anniston Army Depot.

Revitalizing the Depot Maintenance Workforce

The highly technical work being accomplished at the Army's maintenance depots requires a stable workforce. The Army is in the process of identifying and implementing strategies that facilitate the replenishment of the Army depot maintenance workforce to meet current and future mission requirements. A significant number of depot workers that have acquired valuable skills and experience are drawing nearer to retirement. The Army's workforce revitalization plan is focused on developing a future depot maintenance workforce that is balanced in experience and facilitates the orderly transfer of institutional knowledge.

Reengineering Strategies

Ensuring a workforce that can meet current and future workload and mission demands is key to the Army's depot maintenance strategy. In order to accomplish this, the Army is addressing the status of its current workforce, and accurately projecting its future personnel requirements. The recruiting, hiring, training, and retention of workers who have the skills or desire to perform the critical jobs is a major priority for the Army. The Army's strategy for identifying new skill requirements and managing its human capital concentrate on the following areas:

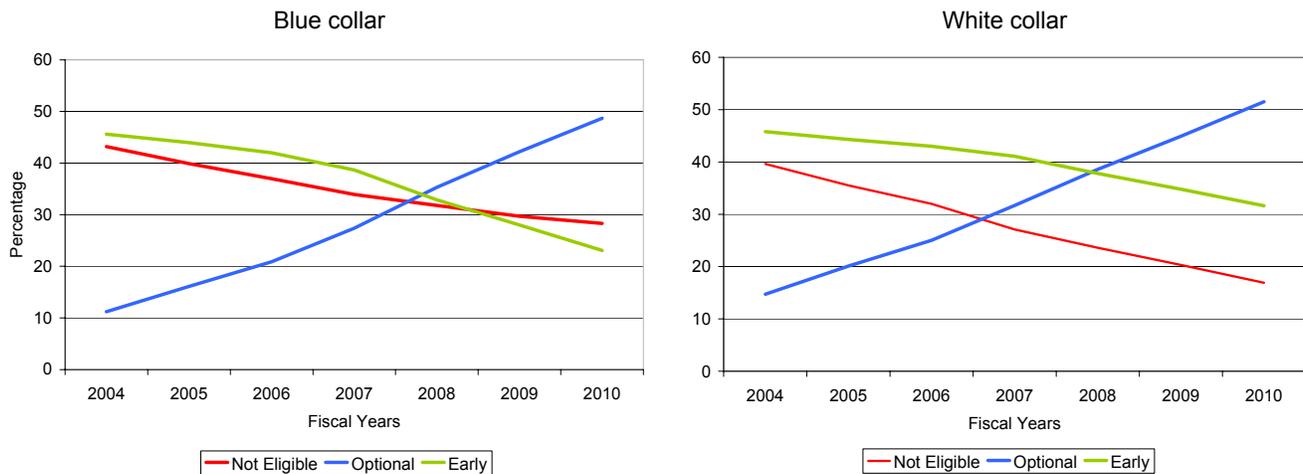
- *Human resource management.* Existing rules for managing the civilian depot workforce are rigid and contrary to the recruiting and retention practices found in private industry. Less bureaucratic human resource management policies will be required to allow the depots to effectively recruit and maintain the necessary caliber of professionals for the depot workforce. The DoD is currently developing implementing regulations for the National Security Personnel System (NSPS), which revises the rules for managing the DoD workforce. NSPS implementation will provide the Army greater flexibility in hiring and retaining human capital to meet the depot workforce challenges of the future.
- *Data collection to facilitate human capital decision-making.* The Army is identifying and addressing the skill gaps between the depot workforce of today and the projected workforce of tomorrow. The depots are identifying their current skill base and critical skill groups, in addition to skills that will likely be lost or required for current or future missions. For each depot, the Army will continue to identify occupations in which substantial change can be expected. This research and workforce, workload, and technology infusion projections permit the depots to better anticipate and meet changing personnel needs.
- *Training and education.* The Army's goal is to provide depot personnel continuous opportunities to train in order to keep pace with advances in technology. The objective is to have the skills required to support advances in technology mainstreamed in the workforce before the requirement is needed in the organic depot logistics pipeline. To accomplish this, the depots are reengineering internal training courses, as well as capitalizing on the educational tools and external instructional resources, such as those available at local colleges and universities.

Replenishment Requirements

Downsizing of the Army depot maintenance workforce since the end of the Cold War has resulted in skill and age imbalances. Since FY1989, the median age of the Army depot civilian workforce has risen from 41 to 50 years of age. In fact, the proportion of depot maintenance personnel over 50 years of age increased from 21.5 percent in FY1989 to 54 percent in FY2004. Consequently, today's depot maintenance workforce is much more experienced than its predecessors. The median years of service increased from 12 years in FY1989 to 22 years in FY2004, with the largest concentration of experience in the 21–30 years of service grouping.

As Baby Boomers begin to retire in increasing numbers, these imbalances in age and experience may jeopardize the orderly transfer of institutional knowledge. Nearly 50 percent of the depot workforce will be eligible for optional retirement by FY2010. Figure II-1 illustrates the civilian retirement eligibility distribution of blue and white-collar depot maintenance employees.

Figure II-1. Depot Maintenance Civilian Workforce Retirement Eligibility



Replenishment Strategies

The foundation of the Army's maintenance depots is its workforce. The age distribution imbalance at the depots adds to the corporate knowledge loss due to large concurrent retirements. A balanced workforce results in evenly distributed annual retirements and facilitates the transfer of information from older to younger employees. The Army is considering strategies that will normalize the age distribution at its organic depots (namely, restructuring buyouts and targeted recruitment).

Workforce restructuring buyouts are good for revitalizing the workforce and correcting skills imbalances. Used properly, these incentives can speed up the excruciatingly slow workforce revitalization process. Voluntary separation incentives entice workers to retire before they otherwise plan to leave; their positions are then restructured and filled at the entry level. This enables management to recruit new workers while sufficient numbers of experienced employees are still in place to train.

Recruitment strategies that attract applicants in the intended target audience also aid workforce revitalization. By carefully choosing among available recruitment tools, the depots can influence the types of candidates referred for consideration. In filling positions, the depots have a number of recruitment strategies available to them. The following are currently under review for implementation:

- *Academic partnerships*—expanded partnerships with local schools, technical schools, and colleges to influence curriculum, develop long-term recruitment sources, and provide a source of interns or apprentices
- *Re-payment of student loans*—repayment of student loans that are authorized to facilitate the recruitment or retention of highly qualified employees in positions that the organizations would have difficulty filling

- *Improved marketing*—marketing the maintenance depots as an “employer of choice” to sources that can provide candidates that possess the qualifications and attributes needed for current and future missions
- *Enhanced Applicant Pool*—ongoing review of current processes and recruitment sources to identify opportunities to target desired applicants, including
 - graduates of local colleges and technical schools,
 - candidates completing active duty assignments relevant to a depot’s mission,
 - well-qualified regional personnel facing downsizing at a current private-sector employer, and
 - well-qualified applicants currently under represented within a particular depot.

Section III—Navy

The Navy is transforming to meet new demands created by shifts in global threats to our nation and its allies. In so doing, it recognizes the need to modernize its weapon systems and reengineer its resources and requirements. The Chief of Naval Operations (CNO) established “Sea Power 21” to emphasize the synergy between the various commands as the Navy reacts to threat conditions and sets the primus for naval preparedness and planning. Sea Power 21 and the strategic goals established by the system commands and their industrial operations management are transforming the industrial enterprise into a flexible and dynamic partnership between organic Navy facilities, commercial suppliers and other Department of Defense depots. In this new partnership, Navy, Marine Corps, and joint force support requirements drive the depth, breadth, and “mix” of depot maintenance capabilities. To that end, the naval industrial enterprise is restructuring to improve its services and products in alignment with the warfighter’s needs.

Instrumental to the Navy’s industrial planning effort is the relationship of the various plans within DoD and the Navy that share the common goal of supporting the warfighter in the field. These plans provide a strategic framework for both near- and long-term naval industrial planning and budgeting.

- **Sea Power 21—Forward from the Sea.**

Forward-deployed naval forces—manned, equipped and trained for combat—play a significant role in demonstrating both the intention and the capability to join NATO and other allies, as well as other friendly powers, in defending shared interests...if deterrence fails during a crisis and conflict erupts, naval forces provide the means *for immediate sea-based reaction*.

- **Joint Vision 2020.**

The overarching focus of this vision is full spectrum dominance—achieved through the interdependent application of dominant maneuver, precision engagement, focused logistics, and full dimensional protection...However, materiel superiority alone is not sufficient. Of greater importance is the development of doctrine, organizations, training and education, leaders and people that effectively take advantage of the technology.

- **Fleet Response Plan.**

Designed to rapidly develop and then sustain readiness in ships and squadrons so that, in the event of a national crisis or contingency operation, the Navy can quickly surge significant combat power to the scene. This requires us to rethink how we maintain our ships and aircraft between deployments, without spending more money for readiness or maintenance, or placing additional burdens on the shoulders of our sailors.

- **Logistics Transformation—Update, Focus and Accelerate.**

The target of the logistics strategic plan is a high level of logistics excellence that engenders *full War fighter confidence* in the logistics process by providing the right product...to the right customer...at the right cost, and at the right time—all the time.

- **Navy Ashore Vision 2030 (NAV2030).**

Transform our installations in support of Sea Power 21. *Develop a 25-year installation master plan* capable of supporting Sea Power 21, Sea Enterprise, Sea Swap, Integrated Global Presence and Basing Strategy, and the Fleet Response Plan. Leverage joint and allied infrastructure and facilities where appropriate.

- **One Naval Shipyard, One Shipyard Enterprise.**

To implement a “one shipyard” enterprise to *support a consistently ready-to-deploy Fleet*. The nation’s naval ship maintenance and modernization industrial base, both public and private sectors, must be effectively and fully utilized in a rapid, responsive and flexible manner to perform industrial work when ships are available.

- **Regional Maintenance Centers.**

NAVSEA is in the process of implementing a Regional Maintenance Plan to streamline the Navy Fleet maintenance process, reduce maintenance infrastructure, maximize productive maintenance output and reduce maintenance costs.

- **Naval Aviation Systems Team.**

The NAVAIR Industrial Enterprise is an integrated public/private support system that takes maximum advantage of its infrastructure and capabilities to deliver assured and affordable aviation depot maintenance products and services to the Navy, Marine Corps and joint operation forces. To meet the requirements of the new transformed Navy, the industrial enterprise will focus on the goals and objectives of the CNO and the Naval Air Systems Command to restructure itself under the guidelines of cost-wise readiness and thereby reduce the cost of ownership to the warfighter, aligned itself to the Fleet and bring depot maintenance into the field (collocated with our operational forces).

The fundamental purpose of our naval forces is to project the power and influence of the nation across the seas to foreign waters and shores in peace and war. Our Marines, sailors, and aviators, train and fight in the harshest environment on earth...at sea and on its shores, close to the world’s trouble spots, and far from a stable and secure industrial support infrastructure. Their operational environment is risky; perhaps the riskiest among all of our combat forces. And their depot-level maintenance requirements are urgent, unique, and compelling. The Navy’s industrial base (both public and private sectors) is capable of meeting these requirements in concept and in execution.

Depot Maintenance Vision and Mission

Vision

The 21st century sets the stage for tremendous increases in naval precision, reach, and connectivity, ushering in a new era of joint operational effectiveness. Innovative concepts and technologies will integrate sea, land, air, space, and cyberspace to a greater extent than ever before. In this unified battle space, the sea will provide a vast maneuver area from which to project direct and decisive power around the globe. Future naval operations will use revolutionary information superiority and dispersed, networked force capabilities to deliver unprecedented offensive power, defensive assurance, and operational independence to joint force commanders.

The Navy and its partners will dominate the continuum of warfare from the maritime domain—detering forward in peacetime, responding to crises, and fighting and winning wars. By doing so, the Navy will continue the evolution of U.S. naval power from the blue-water, war-at-sea focus of the Maritime Strategy (1986), through the littoral emphasis of From the Sea (1992) and Forward from the Sea (1994), to a broadened strategy in which naval forces are fully integrated into global joint operations against regional and transnational dangers. To realize the opportunities and navigate the challenges ahead, the Navy must have a clear vision of how it will organize, integrate, and transform. Sea Power 21 is that vision. It will align efforts, accelerate progress, and realize the potential of naval personnel. Sea Power 21 will guide the Navy in the defense of our nation and defeat our enemies.

Mission

The Navy has developed new Sea Strike, Sea Shield, and Sea Basing warfighting concepts through a supporting triad of organizational processes: Sea Trial, Sea Warrior, and Sea Enterprise. These initiatives align and accelerate the development of enhanced war fighting capabilities for the fleet.

The Navy's shipyard, warfare centers, naval aviation industrial enterprise initiatives, support agreements with other Military Services, and partnerships with private industry function within the larger vision and mission processes. The depot vision and mission will deliver depot-level materials and services in conjunction with our joint service support efforts and private sector partners. The Navy depot vision and mission increases fleet operational effectiveness while minimizing costs and schedule but maximizing the quality its products and services. This vision and mission integrates and aligns with the Navy's strategy, our leaders expectations and encompasses the mutual support within DoD services and the nations industrial infrastructure. These depots will use quality materials, qualified workforces, sound and cost effective work processes in safe and environmentally sound facilities.

Transformation Strategy

The transformation goal is to create and sustain a responsive and cost effective organic or commercial partnership that fully integrates intermediate and depot-level maintenance and that collaboratively develops and sustains the depot-level maintenance capabilities required by Navy, Marine Corps, and joint operating forces. The following are key to the success of the industrial team from both a response and a cost standpoint:

- The ability to forecast, plan, and budget for emerging weapon system technologies and warfighter requirements
- The full integration of capabilities delivered to the warfighter as rapidly and cost effectively as possible
- The ability to maintain a modern, viable infrastructure and relevant workforce in the DoD and commercial sectors
- Resources optimized at both intermediate- and depot-level maintenance activities
- Close proximity of critical components and the asset

- Training, expertise, and continuity for personnel who man the maintenance activities
- Integrated network of logistics technical information that allows real-time planning, asset tracking of assets, depot capabilities, and expertise via telemaintenance, and other new technologies.

Inherent in the Navy's transformation strategy and goals is the need to balance cost and risk between the vast production capacity of industry and the ready, controlled, and responsive core depot maintenance capability of the Navy and other DoD activities. Public-private partnerships will be vigorously pursued and developed on the basis of disciplined and fact-based assessments of future combat technologies, operational requirements, and the relevant industrial capabilities needed to meet those requirements. Performance-based contracts will be developed on the basis of rigorous business case analyses and clearly defined metrics. Roles and responsibilities will be defined and strategies and priorities will be communicated clearly throughout the partnership to maximize response and minimize the cost of unnecessary duplication of capabilities and excess infrastructure.

The primary element within the operational commander's transformation plan (related to maintenance depots) is the consolidation of maritime maintenance resources and contracts. The Navy is in the process of implementing a Regional Maintenance Plan to streamline the Navy ship maintenance process, reduce maintenance infrastructure, maximize productive maintenance output, and reduce maintenance costs. The end-state is fleet maintenance that uses a single maintenance process. The Regional Maintenance Plan consists of three phases:

- Phase one—Optimize interoperability of platform specific intermediate-level maintenance activities.
- Phase two—Integrate intermediate and depot activities.
- Phase three—Conduct fleet maintenance using a single maintenance process.

Phase one has been completed. Phase two is in progress.

The existing ship maintenance organizational structure in each region with home-ported Navy ships evolved to accommodate a much larger force level of ships. The maintenance activity staffing became smaller with the reduction in ship population, but the facilities and organizational framework remained basically the same. The specialization, duplication, and overlap in the different maintenance activities in a region limited the flexibility to best use the maintenance resources available.

A key element of the Regional Maintenance Plan is the consolidation of separate ship maintenance facilities in a region to eliminate these limitations. This concept was piloted at Pearl Harbor in FY1998 and FY1999. Puget Sound Naval Shipyard and Naval Intermediate Maintenance Facility, Pacific Northwest, were consolidated in FY2004. The intent is to implement in the Mid-Atlantic and Northeast in the next 2 years. Operational commanders are also leading the transformation element of the Shipyard Transformation Plan, Ship Maintenance (SHIPMAIN) Program.

The primary elements within the Naval Sea Systems Command's transformation plan are the SHIPMAIN Program and the implementation of "Lean" principles.

Shipyard Transformation Plan

The focus of the NAVSEA ship depot maintenance strategy is to implement a “One Shipyard” ship repair enterprise that supports a consistently ready-to-deploy fleet. The new maintenance One Shipyard concept supports the fleet as it transitions from a rotational force to a surge force, termed the Fleet Response Plan (FRP). One Shipyard initially focused on resource and infrastructure sharing among the shipyards, both public and private, through partnerships and flexible contracting vehicles to meet FRP requirements. The concept has evolved to focus on standardizing and improving shipyard processes for efficiency and effectiveness in support of Sea Enterprise objectives.

Naval shipyards must aggressively transform to support the right force with the right readiness at the right cost. Shipyards must be flexible and responsive to accommodate future changes in force structure, fleet deployment and operations, and ship maintenance strategies.

The ship maintenance and repair industrial base must balance the effectiveness required to support the FRP and sustain the fleet with efficiencies required to recapitalize the fleet. Resource and infrastructure sharing across public-private boundaries will be instrumental in providing cost effective naval ship construction, modernization, and maintenance. At the same time, shipyards must preserve the fundamental values of safety, quality, productivity, and agility and responsiveness. The transformation vision integrates and aligns the Navy’s strategy, the expectations of customers, the industrial base infrastructure and processes, and naval personnel, all the while focusing on ship maintenance, modernization, and repair for fleet readiness. Metrics are vital for measuring progress and results of the transformation journey.

The transformation plan is built upon the naval shipyard performance improvements in cost, schedule, and quality. It leverages the successes in implementing “Lean” techniques over the past few years to create the advancements required by the new environment, and it will incorporate the key elements of the current productivity and performance improvement programs. The Navy initially focused on “one nuclear shipyard”—the four naval shipyards and the two private-sector nuclear-capable shipyards—but it also has moved to more flexible contracting vehicles for the non-nuclear shipyards.

The One Shipyard transformation framework includes six elements:

- Plan and execute work (FRP)
- Improve process and performance (Sea Enterprise)
- Human capital strategy
- Infrastructure strategy (facilities and equipment)
- Industrial excellence for quality and safety
- Alignment, leadership, and customer satisfaction.

SHIPMAIN

The first step to improve maintenance procedures brings together a better way of doing business and enabling sailors to perform their maintenance jobs more efficiently. With the tools SHIPMAIN puts in place, more can be done with only a one-step process. The guiding principle of SHIPMAIN is to increase work aboard ship with present dollars; thus enabling the Navy to affect repairs and meet ships' schedules. By marrying up operations and maintenance, the Navy saves money that can be reinvested in new ships.

Another cost and timesaving initiative that SHIPMAIN brings to the shipyard environment is the use of multiple-ship, multiple-option (MS/MO) repair contracts. MS/MO is a 5-year maintenance contract in place in San Diego and now being implemented on the East Coast. It ensures the Navy can hire the necessary work force, with the needed skill level, order long-lead materials in a timely manner, and coordinate a work schedule that saves money. SHIPMAIN gives the work-force a vehicle to lower maintenance costs by applying business approaches to our maintenance and modernization programs.

“Lean”

At the very core and foundation of the One Shipyard enterprise is the systematic elimination of waste and non-value-added activities from everyday work processes. This can be achieved by employing “Lean” as the business strategy and tool set. “Lean” focuses on customer value from the “deck plate to the boardroom.” For example, the Lean Shipbuilding Initiative (LSI) of the National Shipbuilding Research Program (NSRP) engages the private-sector shipyards and support organizations to improve and accelerate the implementation of “Lean” principles throughout the shipbuilding and repair industry base. The LSI forums include site visits to leading “Lean” businesses (e.g., Toyota, Boeing, and Ford) and active exchanges with other DoD depots to share information and learn from the experience of others.

Naval Aviation Industrial Enterprise

The Naval Aviation Industrial Enterprise is undergoing a fundamental transformation in its operations and support to the fleet. Through the design and implementation of cost-wise readiness, the transformation focuses on an improved structural alignment with the fleet and more efficient business and operations.

- Realignment of the flag leadership will improve organizational agility and decision-making. Strategic direction for naval aviation will come from the Commander, Naval Air Forces (CNAF), with the various direct support system commands (including NAVAIR) aligned under CNAF.
- Great strides have been made to provide cost-wise readiness across the scope of the business and operations through Naval Aviation Readiness Integrated Improvement Program (NAVRIIP), which determines what inventory target levels are required to maintain a certain ready-to-train or operational status and matches the right amount of readiness and cost to achieve and sustain those levels. NAVRIIP's enabler in achieving cost-wise readiness is the application of AIRSpeed. AIRSpeed's tool sets comprise an assortment

of commercial best business process tools, namely Theory of Constraints (TOC), Lean Manufacturing, Six Sigma statistical process control, and various simulation and modeling techniques that are being applied at the organizational, intermediate, and depot-level maintenance activities in support naval aviation.

The primary elements within the naval aviation industrial enterprise's transformation plan for achieving cost-wise readiness are NAVRIIP, AIRSpeed, the Integrated Maintenance Concept ("Leading the way to Affordable Readiness and Reliability") and Reliability-Centered Maintenance (IMC/RCM), intermediate- and depot-level (I/D-level) maintenance integration, joint services maintenance support, and new technology insertion.

- NAVRIIP fundamentally changes the way the Navy provides cost-wise manpower, equipment, maintenance, supplies, and training to stateside naval commands between deployments. It will help the Navy meet the fleet's objectives of "aircraft ready for training and operations." NAVRIIP will bring the operators, providers, and resource network together in real time to expedite solutions to readiness barriers as naval aviation changes its processes. It will
 - support the FRP by increasing sustained cost-wise readiness levels and surge capabilities throughout the Navy;
 - integrate the warfighter's needs to the acquisition cycle, by connecting those needs to the planning, programming, and acquisition communities, and ensuring investments are made in the right products for cost-effective readiness;
 - align the Navy's business processes to Sea Enterprise and drive cost-wise readiness initiatives by compelling commanders to identify operating costs, cost drivers, and methods to reduce cost—naval leaders will be able to develop and implement appropriate strategies for reinvestment; and
 - deliver aircraft for Sea Strike capability by monitoring operational metrics that
 - deliver aircraft ready for training and operations to support the warfighter and
 - inform leaders (in real time) of adjustments needed to meet evolving joint requirements on global threats.
- AIRSpeed enables world-class logistics excellence in naval aviation readiness for the Naval Aviation Enterprise in support of Type/Model/Series (T/M/S) teams. AIRSpeed is characterized by an integrated culture of self-sustaining continuous process improvement through the use of commercial best practices and tools (e.g., TOC, "Lean," Six Sigma, and Aviation Financial Analysis Support Tool [AFAST]). It delivers mission requirements at a reduced resource cost. AIRSpeed provides the planning, training, integration, sustainment, and monitoring of best business practices across the naval aviation enterprise. Its functions include practical application, progress assessment, communication, innovation, and documentation of barriers and lessons learned. Supporting functions include program management, team staffing and management, and resource management of TOC, "Lean," and Six Sigma practices.
- The Integrated Maintenance Concept improves the overall condition of naval aircraft and makes depot maintenance requirements more predictable and affordable by transitioning

to fixed operational service periods and implementing sustained maintenance planning based on the analytical techniques of Reliability-Centered Maintenance. IMC/RCM is a major component of the Navy's Affordable Readiness initiative and will provide cost-wise readiness and improve aircraft ready-for-training and operations metrics.

- Migration of depot artisans and processes to the intermediate levels will provide cost-wise readiness by optimizing resources of both the intermediate- and depot-level maintenance activities. Critical components will be kept closer to the flight line, with reductions in turn around time (TAT) and transportation costs. I/D-level maintenance integration will establish the right mix of intermediate-level and depot-level capabilities; ensure a collaborative maintenance synergy—with shared resources, where appropriate; and lower repair cycle times while promoting efficiencies. Additional benefits of the I/D-level maintenance integration include
 - a reduction of asset inventory requirements and divestiture of surplus or redundant inventory;
 - experienced depot artisans working with sailors and Marines, imparting the latest depot repair techniques and in-depth technical knowledge to warfighters with varied skills; and
 - a common understanding of the naval aviation repair business and a more seamless operational-, intermediate-, and depot-level maintenance management paradigm, with more efficient use of maintenance assets and personnel.
- Naval aviation maintenance will broaden its joint services support initiatives. For example, NAVAIR has participated in Joint Depot Maintenance Strategy Team (JDMST) for the logistics planning and analysis associated with depot maintenance support of the Joint Strike Fighter (JSF). The JDMST developed the joint core methodology, the JSF depot source of repair (DSOR) assignment process, and the JSF DSP evaluation procedures, which
 - allow the JSF Program Office to make best-value support decisions that are consistent with current statutory requirements (10 U.S.C 2464) and maintenance policy
 - provide for contractor or original equipment manufacturer participation commensurate with PBL responsibilities;
 - ensure defensible, auditable DSOR decisions; and
 - maximize public-private partnering.
- NAVAIR's industrial enterprise will continue to explore new technologies that enhance its ability to provide cost-wise readiness throughout its industrial base and joint service commonality. Two such applications are the DoD's unique identification (UID) initiative and the joint services Agile Rapid Global Combat Support (ARGCS).
 - ARGCS is the next generation test (Nxtest) DoD joint services, automatic test equipment (ATE). ARGCS has six objectives:
 - System interoperability among services (to include coalition partner services) and between weapon systems at all level of maintenance

- Accelerated test support equipment availability in support of weapon systems development
 - Rapid enhancement and system improvements
 - Optimized logistics and support costs
 - Reduced logistics footprint
 - Reduced time-to-repair and level-of-repair rates, and higher return rates.
- Unique identification of tangible items includes NAVAIR’s investment in serial number tracking (SNT) through automatic identification technology (AIT) and its compliant infrastructure. The industrial enterprise will continue to support these efforts with the program managers to meet operational support performance requirements and sustain their systems in the most cost-effective manner over its total life cycle. UID will
- enhance logistics, contracting, and financial business transactions supporting U.S. and coalition troops;
 - enable DoD to consistently capture the value of items it buys, control these items during their use, reduce operating costs and combat counterfeiting of parts; and
 - enable DoD to make appropriate entries into its property accountability, inventory, and financial management information systems to achieve compliance with the Chief Financial Officers Act.

The industrial enterprise will actively pursue the latest technologies and equipment that provides maintenance and engineering information to artisans in the field on demand and in real-time.

These transformation initiatives, in combination, are designed to meet the goals and objectives of the Naval Air Systems Command:

As a part of the Naval Aviation Enterprise, NAVAIR’s vision is to provide cost-wise readiness and dominant maritime combat power to make a great Navy and Marine Corps even better. The goals necessary to achieve that vision include; a balanced current and future readiness, reduced the cost of doing business, improve agility, ensure alignment, and implement fleet-driven metrics.

Strategy for Maintaining Core Logistics Capability

Navy core capability will be augmented to the maximum extent possible by other DoD industrial sources on the basis of quantifiable risk and value. The future of depot maintenance interservicing lies with innovative joint service capability ventures and private-sector support that preserves individual service core capabilities and capitalizes on the unique capabilities of each “partner.”

Interservice collaboration is a valuable industrial and business practice that reduces redundant capabilities within the DoD. Alliances with other DoD maintenance providers are necessary to

promote business process efficiencies, satisfy statutory core requirements (organic capability/capacity), eliminate duplication, and ensure affordable flexibility.

There are two primary concerns that drive the preservation of minimum essential core depot maintenance capabilities:

- A ready and controlled source of technical competence and resources for depot level maintenance and repair capability ensures timely response in the event of mobilization, an emergency, or national contingency situations.
- The Navy must be a “smart buyer” of depot support.

Core capability is defined as the minimum capability (skilled artisans, equipment, and facilities) needed to accomplish depot-level maintenance and repair of naval weapon systems and other military equipment designated for primary combat use. The Navy will maintain an efficient core depot maintenance capability—core plus cost-effective business base—to sustain both peacetime readiness and wartime surge capability at an affordable cost to the warfighter. The Navy depots will be sized (in terms of infrastructure) and shaped (in terms of capability) to support naval readiness when organizational agility, flexibility, and proximity to the operating forces are crucial to accomplish the mission.

Core

Depots will maintain core capability, with a clear focus on products and services that have the greatest near-term effect on combat readiness. To comply with the statutory requirements set forth in 10 U.S.C 2464, the Navy applies the DoD Core Methodology to determine its core capability requirements and the workloads needed to sustain that capability. The methodology considers the tasked platforms and mission-essential equipment requirements established in the strategic planning guidance and JCS’s contingency plans.

Focus

Depots will employ advanced in-service engineering and logistics skills, coupled with advanced systems-driven knowledge management tools, to capture, integrate, analyze, and employ system-wide maintenance data to assess system condition, anticipate future problems, and institute innovative programs to increase material readiness. The Navy depots will shift their maintenance focus from corrective to preventative maintenance.

Mobility

Navy depot maintenance capability will continue to expand on its agility and mobility (that is, deployable as close to the warfighters as required). Depot capability will be collocated with industrial partners to enhance readiness, logistics support, and cost effectiveness. New mobile maintenance tools and equipment will be developed, along with supporting digital data and training. This will help depot artisans perform required maintenance aboard ship and on the flight line, or to remotely “coach” on-site maintainers when deploying depot personnel is impractical.

Affordability

Technology-based lead-follow depots can significantly reduce duplicate capability and excess capacity. Non-core depot services and support will be minimized to only what is necessary to maintain cost-effective operations. The regional or area command transformation initiatives will examine local consolidation for overhead savings.

Modernization

Maintaining a responsive and relevant core depot maintenance capability is not an event. It is a continuous process. Modernization is a disciplined process of looking to the long-range planning horizon for warfighter-based capability requirements, and developing a supportive, defensible, and affordable depot modernization plan. Depot modernization must be planned, programmed, budgeted, and then vigorously defended on the basis of disciplined and structured cost and risk analyses.

Revitalizing the Depot Maintenance Workforce

The depot workforce of the future will have multiple skills and will be mobile—ready to deploy at a moment’s notice, with tools and technical data to support the combat forces. Employees will operate in a virtual knowledge environment using the most advanced information management tools and techniques. The workforce will be highly trained and capable of supporting the newest and most advanced combat systems used by naval and joint operating forces.

The organic aviation and maritime depot workforce has been reduced by 56–61 percent in the past 10 years. It is an aging workforce—on average nearly 45–48 years old, with 31–33 percent projected to leave in the next 5 years. An aggressive human capital strategy will be used to size and shape the work force. The Navy will develop tools to plan and analyze workforce skill and capabilities, and then match them to the products and services required to support the warfighter. Overlaps between the projected workload and workforce will be addressed through planned attrition, Voluntary Separation Incentive Payments (VSIPs), and reassignment or retraining. Gaps in the workforce will be filled through aggressive retraining initiatives, with targeted hiring a last resort to maintain critical skills.

One example of the Navy’s human capital efforts is the naval shipyard workforce revitalization effort, which is an integrated element of the overall human capital strategy and plan. This multi-faceted approach provides a knowledgeable and skilled workforce that is ready to accomplish current and future workload. The plan is based on workload, budget, workforce demographics, and transformation plan initiatives. Specific elements of the successful strategy and plan include

- public-private partnerships and workforce sharing under the “One Shipyard” initiative,
- hiring to replace attrition,
- hiring apprentices¹ for long-term skill revitalization,

¹ The apprentice program is the foundation of the shipyard workforce revitalization and hiring plan for the skilled production trades workforce, and is vital to ensuring a future ship maintenance capability to meet fleet readiness requirements.

- hiring of entry-level engineers and production personnel to rebalance the grade distribution within each naval shipyard, and
- use of seasonal or temporary personnel to achieve a more flexible workforce to handle major workload variations and leadership development programs.

Summary

The future viability of the Navy depot industrial enterprise is dependent upon the following:

- Successful completion of naval aviation's transformation plans, focusing on improved alignment with the fleet and efficiencies improvements based on cost-wise readiness.
- Effective implementation of a human capital strategy that provides the right people with the necessary skills, at the right time, and in the right place
- Application of best commercial practices (i.e., "Lean," TOC, Six Sigma)
- Refreshment of necessary and up-to-date equipment, facilities, and infrastructure
- Execution of overhead cost reduction initiatives and consolidation
- Teaming with other services and private industry to reduce duplication and over capacity
- A sustained focus, investment, and leadership support

Fulfillment of this plan will ensure the next generation of depot-level support delivers unparalleled 21st century maintenance capabilities and support to our naval combat forces around the world.

Section IV—Marine Corps

United States Marines are deployed around the world in 2004—from Iraq and Afghanistan to Northeast Asia, from the Republic of Georgia to the Horn of Africa, and from the Philippines to Romania. Marines are deployed at sea on warships from the Expeditionary Strike Groups and conduct sustained operations deep inland in support of U.S. security interests and commitments. Our top priority is to maintain a high state of readiness and to provide capable forces to meet the demanding needs of the unified combatant commanders and our nation in the prosecution of the Global War on Terrorism. The Marine Corps has been setting the force in order to enhance war-fighting readiness for future contingencies. Although the force is under some stress, we continue to meet our operational commitments.

As a result of continuing intense operations, our aviation depot, which is managed by the Navy, and our Marine Corps ground depots have proven to be valuable national assets. This section of this report focuses on the Marine Corps' two ground depot maintenance facilities. The Marine Corps wartime maintenance capability continues to provide strategic significance by supporting deployment, sustaining operating forces, and constituting during and regenerating after a conflict. However, as a consequence of the procurement pause of the 1990s, many of our weapons, ground vehicles, and support systems are approaching block obsolescence. In the last decade, the size of Marine Corps forces declined while the number of contingencies increased. Under these circumstances, our equipment has been put under heightened stress. Marines are spending increasing amounts of time conducting preventive and corrective maintenance. In addition, the Marine Corps is spending more money on spare parts to repair its legacy equipment. Acquisition programs seek to address this concern, but the process of replacing critical equipment takes time. As a result, Marine Corps legacy systems and the efforts of Marines to maintain them will remain central to the readiness of the Marine Air-Ground Task Forces until modernization programs replace aging equipment.

Increased operational tempo, aging equipment, and fewer maintenance support personnel in the operating forces create a challenge for the Marine Corps to maintain readiness in environments that range from combat to peacekeeping and humanitarian assistance contingencies. The contingency operations typically take place in salt-water maritime environments that greatly increase the required maintenance on our equipment.

The Marine Corps' maintenance depots' peacetime mission has been of exceptional value to the Marine Corps and other customers in underscoring readiness and ensuring equipment remains operationally capable in a resource-constrained environment. This organic depot maintenance capability exists to ensure responsiveness to operational demands in times of peace, war, and other contingencies. It provides a ready and controlled source of technical competence. During wartime or contingencies, Marines surge repair operations and realign capability to support the immediate needs of warfighters. Following wartime operations, Marines regenerate the Maritime Pre-positioned Force, Marine Expeditionary Forces, and constitution of the total Marine Corps to pre-conflict readiness levels.

The organic depots play a significant daily role in equipment readiness, along with Marine Corps field activities. The equipment stays ready due to the hard work of Marines and civilian Marines. The cost, however, continues to grow because the primary equipment and weapons systems in our ground combat elements and supporting organizations have reached or exceeded their programmed service life. Consequently, the Marine Corps is implementing a series of new management initiatives to achieve depot maintenance goals of high states of readiness, combat sustainment objectives, efficient production processes and cost reductions—all while sustaining quality. A few examples are increased use of partnering with private industry, partnering with other government agencies, and adopting and adapting private industry best business practices.

Other Military Service depots and private contractors supplement the Marine Corps' organic capability. In some cases, they provide unique skills, facilities and technology unavailable in Marine Corps organic depots. They provide a redundancy necessary to ensure extra capacity is available when required. Performance-Based Logistics product support strategies enable Marines to use these capabilities to optimum advantage, ensuring the Marine Corps has the best source of repair for ground weapon systems and ground support equipment.

The Marine Corps' Multi-Commodity Maintenance Centers perform maintenance on more than 260 different systems that span all commodity areas. These systems run the spectrum from circuit cards to the Amphibious Assault Vehicle (AAV), the M-9 pistol, and the M198 Howitzer. Many of the items in the Marine Corps' weapon system and ground support equipment inventory are unique to the Marine Corps and few in number. Often, the organic depots are the only source of repair for these items.

The focus for the depots is on modernization and making an effective transition—transforming from being the default source of repair for Marine Corps weapons and equipment (as in the past) to becoming the preferred source for maintenance capability of ground weapons and ground support equipment in the future. The acquisition of new fleets of equipment that require new maintenance technology and the increased use of contractor logistics support will require a change to the depot maintenance capability requirements, necessitating a realignment of the workforce, maintenance procedures and facilities.

The focus on capital investments ensures the required capability is available. Strategic partnerships with industry employ innovative strategies, right size facilities and equipment, and leverage underutilized capacity. Recognizing that technology is continually evolving with new or improved weapon systems, the Marine Corps will ensure critical new technologies are infused into our depot capabilities.

Expedition-enabling logistics is the heart of our organization. Our multiple-commodity, collaborative maintenance process works for the Marine Corps in providing first class depot maintenance support to the Marine Corps, other Services, federal agencies and foreign governments.

Depot Maintenance Vision and Mission

Vision

Excellence in Logistics Supporting Excellence in Warfighting.

The Marine Corps shapes logistics plans and policies to sustain excellence in warfighting. The focus of effort is to increase Marine Air Ground Task Force lethality by providing superior support through modernizing logistics processes, implementing proven technology and best practices, developing standards of performance, and fully integrating the supporting establishment as the fifth element of the Marine Air Ground Task Force.

Mission

The *mission* of the Marine Corps in the area of depot-level maintenance is to maintain optimum strategic depot-level capability required to support expeditionary operations, providing for the repair of weapon systems, ground support equipment and secondary reparable ensuring readiness in peacetime, sustainment of forces in wartime, constitution during and regeneration after conflict.

Transformation Strategy

The Marine Corps has instituted a number of management initiatives that will ensure its depot maintenance centers are positioned for success in the future. In preparation for current global operations, the maintenance, repair, or replacement of equipment is the focus; but as the Marine Corps sets the force, it keeps modernization and transformation in mind.

In all of the depot maintenance activities, the Marine Corps strives to improve readiness of ground weapon systems and ground support equipment through effective depot-level maintenance. It seeks to improve the effect that maintenance has on overall readiness by obtaining quality and “best value” capability. One initiative is to implement a process for the review of business case analyses to determine the best value for the depot-level maintenance decisions at the enterprise level, which continually improves the way the depots do business. The depot-level source of repair (DLSOR) process institutionalizes these improvements. The measures of effectiveness are reduced overall maintenance repair cycle time (RCT), increased mean time between failure as a result of improved maintenance quality, and reduced costs as a result of maintenance efficiencies.

The Marine Corps has chartered a cross-functional team to evaluate various innovative and creative applications of business reforms and best practices in the area of PBL. This working group will draft a Marine Corps Order regarding PBL and produce a PBL process/procedures handbook. Areas of PBL study and action include business case analyses (BCAs), performance-based agreements, metrics development, training materials, and statements of work/statements of objectives.

In early 2004, the Marine Corps Logistics Command chartered a Unique Identification/Radio Frequency Identification (UID/RFID) Working Group, with members from all of its core functional areas, as well as ad hoc members from Marine Corps Systems Command and the Defense Logistics Agency (DLA). This working group was chartered to address the policy memorandums of the Under Secretary of Defense (Acquisition, Technology and Logistics) for UID/RFID and the Migration to the Defense Logistics Management Standards (DLMS). This group has been actively participating in summits and conferences held by OSD on UID and RFID, as well as participating with Office of Naval Research (ONR) Repair Technology in a pilot project that is assessing the impact of implementing UID in the Navy and Marine Corps depots. The objective is to establish a responsive policy that will implement the UID/RFID across the Marine Corps.

The Marine Corps' two multi-commodity maintenance centers continue to implement business process improvements. They are both ISO 9001:2000 registered.¹ Process Standards, Earned Value Management, Manufacturing Resource Planning (MRP II), Lean Thinking, and Theory of Constraints are business process improvements that have been implemented and form the framework for cost, schedule and performance measures required to achieve the strategic goals of improved cycle time, improved quality, and reduced cost per repair. The initiatives listed below also increase logistics responsiveness, effectiveness, and efficiency:

- Institutionalize a standard process to review drafts of the Acquisition Supportability Documents (ASD). The ASD will include skill sets and facilities required to perform maintenance and will become a permanent record within the acquisition documentation.
- Develop policy and implementation plans to optimize the Marine Corps' use of Condition-Based Maintenance (CBM).
- Ensure a diversified depot-level repair capability and identify skill set requirements through 2020.
- Ensure facilities and equipment are available to support existing and future weapons/systems/equipment while allowing sufficient flexibility to incorporate emerging technology and facility upgrades as required.
- Institutionalize an environment that fosters creativity and innovation for implementation and application of business reform and best practices.
- Develop a global capability to provide timely emergency maintenance support to overseas and deployed units, as required.
- Implement the use of public-private partnerships as a successful strategy to accomplish depot-level maintenance workloads—sustaining robust organic depot-level maintenance capabilities and increasing use of commercial capabilities for functions at which the private sector excels.

¹ ISO 9001 is the internationally recognized Quality Management System standard.

Strategy for Maintaining Core Logistics Capability

Approximately 30 percent of Marine Corps war fighting capability was deployed to support OIF II. The heightened operating tempo (OPTEMPO) will continue to increase the need for maintenance, including depot repair. The timeframe for equipment rotation out of theater and into maintenance facilities is currently under evaluation with a focus on replenishing Marine Corps capability lost due to combat losses and heightened demand/usage of equipment. The outcome will consider the total life cycle management solution to include organic repair both internal to the Marine Corps and other Service's capability, outsourcing to private industry, increased production line acquisitions, commercial derivative acquisitions, or acceptance of some level of degraded mission performance until a future solution is identified (e.g., follow-on technology). The end objective is to maximize the output leveraging the combined maintenance capability available to the Marine Corps.

In addition, we are exploring the potential for conducting depot level maintenance overseas to reduce the amount of equipment rotation to the continental United States (CONUS) for repair. The industrial infrastructure in Iraq is very limited so we are taking advantage of Contractor Logistical Support arrangements, such as Oshkosh and Caterpillar of Kuwait. Further, we are experimenting with conducting depot-level maintenance in other theaters. For instance, we have recently shipped two vehicles (M931 Tractor and M970 Tanker/Trailer) from Okinawa, Japan to an Army-run maintenance facility at the Materiel Support Center-Korea as a test case to assess the degree of depot-level maintenance that can be accomplished in that theater.

The Marine Corps is aggressively pursuing new initiatives and outside sources to maintain and repair our combat equipment in theater. For example, in Iraq, First Marine Expeditionary Force (MEF) is working with the U.S. Army Materiel Command to identify mutual support arrangements. While there is little depot maintenance capability currently in theater, we will continue to leverage the advantages gained from this partnership.

Marine Corps Logistics Command and Marine Corps Systems Command have several partnerships in place to optimize our capability and maximize return of assets to the warfighter. The Marine Corps also constitutes its Maritime Pre-positioned Force (MPF) equipment, that requires less than depot level repair, through a successful Prime Contractor Relationship with Honeywell Corporation. We will continue to aggressively seek partnerships to complement depot capability and capacity to meet Marine Corps requirements. In addition, a large share of our depot maintenance funding is used on our Marine Corps M1A1 Main Battle Tanks at the Army's Anniston, Alabama, depot for repair and rework.

Currently, the Marine Corps has a partnership agreement with United Defense for the AAV Reliability Availability Maintainability/Rebuild to Standards (RAM/RS) Program. The Expeditionary Fighting Vehicle (EFV) Direct Reporting Program Management Office's Transition Task Force is defining future core requirements and possible industry partnerships for maintenance of this vehicle and/or its components. Other current partnerships are with W. W. Williams Detroit Diesel and the U.S. Army for depot work on the Heavy Expanded Mobility Tactical Truck (HEMMT); Oshkosh Truck Corporation for the Marine Corps Logistics Vehicle System (LVS); and Raytheon Corporation for the repair and upgrade of the Tube-Launched, Optically Tracked, Wire-Guided (TOW) missile systems.

The Marine Corps is actively investigating partnerships involving government-owned/contractor-operated (GOCO) and contractor-owned/contractor-operated (COCO) facilities. Marine Corps Bulletin (MCB) 3000 lists the systems that are JCS scenario-dependent. The Marine Corps evaluates this input annually to ensure this list is sufficient to sustain the depots' core capabilities in accordance with DoD policy. In May of 2004, the Marine Corps calculated the core requirement for FY2005 to be 1.5 million direct labor hours.

In anticipation of future requirements, the Marine Corps continually studies its depot maintenance operation, with the objective of ensuring the proper skill sets, tools, and facilities are in place for future requirements. During the next 5 years, the Marine Corps will continue to maintain its established core capabilities on legacy systems while evolving core capabilities on newer, possibly modularized, pieces of equipment.

Finally, the Marine Corps is developing a Total Life Cycle Management Assessment Tool. It will integrate equipment usage rates, combat losses, and cost factors from its operating forces, program managers, and Marine Corps Logistics Command. This tool will provide a baseline from which sound, prudent, mission-focused Marine Corps management decisions can be made regarding equipment investment for maintenance and new acquisitions. It will substantially improve The Marine Corps' enterprise-wide decision-making process.

Revitalizing the Depot Maintenance Workforce

Reengineering Strategies

Training requirements for maintenance center employees are determined by workload requirements and managed with each tradesman's Individual Development Plan (IDP). The Marine Corps is also creating Individual Development Plans for our co-op positions to ensure proper skill sets for new employees. This process helps to ensure all training requirements are identified and accomplished prior to the induction of the work requirement.

The personnel employed at both Maintenance Centers possess more than 70 different skills. The Marine Corps strives to cross-train its employees to repair a wide variety of equipment within each major skill. This provides the flexibility to realign the workforce to accommodate shifts in workload among commodities, change production lines from year to year, and perform special projects.

As it transition into a workforce of the future, the Marine Corps constantly seeks to improve current skill levels and develop new ones. New skills that will be required in the near future include composite materials repair, friction-stir welding, materials engineering, non-destructive evaluation and inspection (NDE/NDI), operating robotic and laser machinery, and improved computer literacy. For example, the new Expeditionary Fighting Vehicle hull structure will be made from a forged metal that requires special welding skills and equipment. New maintenance mentoring and telemaintenance technology, which requires intensive computer skills, is less than 5 years away. Substrate, coating, and bonding technologies are moving into the high-tech arena. NDE/NDI skills will dramatically change the way Marines inspect and evaluate vehicle condition. Robotic automation is the technology of tomorrow in welding, painting, and inspection processes. Laser technology will be utilized in coating removal, cutting, and welding processes.

The Marine Corps is actively involved with the National Center for Manufacturing Sciences (NCMS), Manufacturing Technology (MANTECH), and various other joint programs that provide technical evaluation, research and a visionary perspective of future maintenance technologies.

The Marine Corps has adopted communities of interest as an approach to civilian workforce planning and management. Civilian career groups have been broken up into 21 communities or occupation groups, each led by a senior civilian manager. In support of its depot maintenance activities, the Marine Corps is establishing a broad community that includes industrial trades, manufacturing, and production occupations.

The purpose of these communities is to identify the required competencies and training, and develop career paths from entry level to senior level. These are integral to a comprehensive career and leadership development program, which includes the following components: technical and leadership competencies; identified career paths; skills assessment; opportunities for training development through classroom, e-learning, and rotational assignments; and opportunities to compete for formal schools and programs outside the Marine Corps.

The Marine Corps has made significant strides in accomplishing the objectives defined in its workforce strategy. Accomplishments relevant to workforce revitalization are as follows:

- Trade skill requirements have been identified (including certification and cross training and rotation requirements).
- Training requirements associated with new product lines and new technology, equipment, and systems have been identified.
- Training requirements associated with new safety and environmental issues have been identified (includes procedures to track causes of injuries).
- Skills required by the workforce have been identified (skill requirements determined or updated by workload requirements and IDPs).

The Marine Corps constantly seeks innovative methods to reengineer its employees' skills for future requirements. A prime example is its participation in the Maintenance Exchange Apprenticeship Program (MEAP). Through this partnership, the Marine Corps leverages short-term training provided by local and state agencies and utilizing temporary and term employees to fill short-term needs. It also uses business process reengineering to improve and enhance its capabilities and to leverage the tremendous advantages made in the world of information technology.

Replenishment Requirements

The Marine Corps recognizes that its greatest asset is our people. As the civilian Marines prepare to retire, succession planning becomes an area of heightened focus. Table IV-1 provides Marine Corps depot maintenance workforce losses and gains data for FY2002 and FY2003. The data includes both permanent and temporary employees. The Marine Corps's is closely monitoring the retirement intentions of its employees in order to replenish skills.

**Table IV-1. Depot Maintenance Workforce
Experience Losses and Gains**

	FY2002	FY2003
Separations		
Blue collar	137	117
White collar	21	21
Accessions		
Blue collar	73	108
White collar	8	3

Table IV-2 provides projected depot maintenance workforce end strength data for FY2004 and FY2005. Specific data for FY2006 through FY2009 is projected to be similar to that of FY2005; however, trends are closely monitored as a result of OEF/OIF operations and heightened depot repair requirements.

**Table IV-2. Depot Maintenance Workforce
Authorized Strength**

	FY2004	FY2005
Blue collar	1,387	1,223
White collar	304	280

Replenishment Strategies

The Marine Corps' logistic strategic plan provides the framework that supports the depots' workforce reengineering and replenishment requirements. Efforts to achieve these requirements include using temporary and term employees to fill short-term needs, implementing academic partnerships, and using student employment (co-op) programs, and implementing the special workforce restructuring buyout authority to correct skill imbalances (succession planning).

The Marine Corps has historically used temporary and term employees to expand its depot maintenance workforce to fill emergent short-term needs. This avenue allows the flexibility required with ever-changing workload requirements.

The Marine Corps has also established recruiting relationships with the Georgia Department of Labor's Rehabilitation and Vocation Department and with Albany Technical College to recruit and train individuals to fill anticipated vacancies. A similar relationship is being sought with comparable California agencies. It is currently working with the Albany Technical College to develop an apprenticeship program that will serve the Albany, Georgia, and Barstow, California, maintenance centers. The program will allow both centers to participate via classroom, video teleconference (VTC), and on-the-job training. The purpose is to provide additional training so newly hired employees transition to the journeyman level with a formalized training program.

The co-op program has proven a valuable asset at both of maintenance centers. Several co-op students have been converted to permanent employees—making this an avenue to fill attrition, retirement, and other vacancies among our direct labor workforce. These co-op students are in technical schools studying trade skills (such as diesel engine diagnostics, electronics, welding, and electrical equipment repair). The younger age of the co-op students reduces the average age of our total workforce, which currently is 49 years old. It also lessens the training “burden” because co-op students have the benefit of the most updated training at school coupled with on-the-job training. Another benefit of adding co-op employees to the Marine Corps’ workforce is it has raised the overall education level of the workforce.

A secondary benefit of the co-op/apprenticeship programs is the strengthened relationship between the Marine Corps and the local townships. These programs give the apprenticeship employees the opportunity to gain hands-on experience, earn income while they learn trade skills from professionals, and obtain job security. The continued and increased use of apprentice-type programs at both Marine Corps maintenance centers should supplement as well as increase and update the skill levels of the workforce. Having a Depot Maintenance Co-op/Apprenticeship Program will help the maintenance centers substantiate a successor workforce, preserve core workload capability and skills, and supplement surged workload requirements that result from military operations in support of the Global War on Terrorism.

In the Albany Maintenance Center, the Marine Corps has partnered with the South Georgia Construction and Maintenance Council. One of the primary roles of the organization is to assist the Albany Technical College’s Skills Academy in developing new programs and training plans. This will benefit the Marine Corps in the future with recruitment and retention of a highly trained, younger workforce. This program will provide an apprentice-level workforce, and result in shorter training periods, higher quality output, and a well-trained workforce for the future.

The Barstow Maintenance Center recently implemented the Student Career Experience Program. This program provides area college students with hands-on experience that is directly related to his/her educational program and career goals. The Barstow Maintenance Center currently has students from the local Victor Valley Community College working in the Metrology Shop on the TOW, Javelin, and Shoulder-Launched, Multipurpose Assault Weapon (SMAW) missile systems. The Trades Department is gearing up to hire several more employees under this program. It benefits the student with a “get paid as you learn” opportunity and helps revitalize the maintenance center’s workforce with younger workers educated in equipment and systems associated with modern repair technologies.

Summary

The Marine Corps depots continue to serve the Operating Forces and the American taxpayer well. Their role in protecting Marine forces and returning critical equipment and assets to the fight are truly admirable. As a result of our intense operations, our depots have once again proven themselves to be a national asset. The Marine Corps depots’ wartime capability continues to give them strategic significance by supporting deployments, sustaining operating forces, and constituting during and regenerating after conflict.

Section V—Air Force

As the national military strategy has evolved to meet new threats and embrace new operational concepts, the role of the Air Force has changed to meet these challenges. The Air Force is transforming itself into an expeditionary force able to provide a full spectrum of air and space capabilities that can reach anywhere in the world at anytime. Since 1990, the Air Force has been involved in significant and continuous engagements, from Desert Storm to Afghanistan. The Air Force's ability to meet the challenges of today and tomorrow is based on mastery of six core competencies: aerospace superiority, information superiority, global attack, precision engagement, rapid global mobility, and agile combat support. Mastery of these core competencies enables the employment of specific task forces (e.g., the Global Strike Task Force) that are tailored to meet operational mission requirements.

One of the key components of agile combat support is the capability to provide reliable, flexible, and timely support services and products to the operational forces worldwide. A robust, modern depot-level maintenance and repair capability is a critical element of that overall support capability. The capability to provide depot maintenance and repair on Air Force weapon systems is a core competency of the United States Air Force.

Air Force depots have played a vital role in the success achieved by the Air Force in past decades. In order to ensure the Air Force remains the premier air and space force in the world during the next decade and beyond, the Air Force is fully committed to sustaining a healthy depot-level maintenance and repair capability. To accomplish this, the Air Force has a focused strategy, a coordinated implementation plan, and strong leadership commitment.

Depot Maintenance Vision and Mission

Vision

The Air Force vision is to create and maintain three world-class organic depots to provide focused combat support to the warfighter. The Air Force depot maintenance strategy implements this vision and leverages the core competencies of both the public and private industrial and technology sectors. Partnering with the private sector to ensure capabilities that complement Air Force organic depot maintenance is key to the plan.

Mission

The overarching objective of the Air Force's depots is to ensure Air Force weapon systems and equipment are safe and ready to operate across the whole spectrum of operations, from training to supporting major theater wars. To achieve this overarching objective, the Air Force must leverage the best capabilities of both the public and private maintenance, repair, and overhaul operations.

Within the public sector, the three Air Force depots must be world-class maintenance, repair, and overhaul operations and service providers. World-class organic operations require the Air Force to

- recruit, train, and retain a high quality workforce;
- implement innovative depot maintenance processes; and
- sustain a robust, modern, properly sized infrastructure.

Ensuring a robust, modern, reliable private-sector capability to perform Air Force depot maintenance work is another essential element of the Air Force's overarching objective of maintaining safe and ready-to-operate weapons and equipment. Dual sourcing strategies for selected workloads provide significant risk reduction against potential support disruption and provide potential competitive alternatives. Sharing of workload between the public and private sector also creates significant partnering opportunities. In order to complement the Air Force's organic capabilities, the commercial sector supporting the Air Force must be world-class as well. That is why the Air Force strategy embraces the need to sustain a robust and capable complementary private industry repair capability.

Transformation Strategy

Depot maintenance transformation has been integrated into Expeditionary Logistics for the 21st Century (eLog21). eLog21 represents the Air Force's new level of commitment to boldly transform current logistics process to better support the warfighter. This transformation effort offers vast improvements to the effectiveness (and costs) associated with logistics support to combat forces. It also represents an approach to transformation that cuts across stovepipes, thus eliminating burdensome processes and legacy systems used Air Force-wide. The Air Force's overall strategy is to provide focused support to the warfighter through the seamless, integrated use of both the public and private capability.

To implement this strategy the Air Force has instituted a focused depot strategic planning process that addresses each component of a world-class support operation: workforce, processes, and infrastructure. The strategic planning process integrates the existing biennial core capability determination process, the revised source-of-repair assignment process, the acquisition strategy process, existing and planned public-private partnerships, and the emerging Enterprise Management concept into a coordinated assessment of support planning for new systems and technologies as well as legacy systems and equipment. This planning process is tied to the overall Air Force corporate resource allocation process. The results of this depot strategic planning process is a living, executable master plan for achieving the Air Force's overarching objective for both new and existing weapon systems and equipment.

Fundamental to the strategic planning process is the biennial core capability determination that defines organic core capability requirements and assesses potential candidate workloads. Depot-level maintenance and repair requirements not required to satisfy core capability requirements use a "best value" analysis for allocating responsibility for workload accomplishment. This ensures the workload is performed by the highest quality, most responsive, and efficient source. The source-of-repair decision is made through the source of repair assignment process (SORAP), which begins with a core determination decision, includes 50/50 analysis, and ends with a cost-

benefit analysis. To this, the Air Force adds last available source, foreign military sales, and interservice workloads. The Air Force calls allocating workloads above core, “core-plus.” Core-plus ensures the Air Force workloads the depots efficiently in order to meet wartime requirements. This allocation process ensures adequate depot maintenance capability is available to provide credible and competitive public and private alternatives as determined by the best value analysis process.

Partnering with the private sector to ensure access to complementary or dual depot maintenance capabilities is an integral element of the Air Force depot strategy. It allows the Air Force to simultaneously support aging weapon systems laden with obsolete hardware and software, while integrating support for new and advanced technology weapon systems now entering the inventory. Partnering provides the opportunity to share investments, benefiting both the public and private sectors. Utilizing the same facilities and equipment used to produce new systems for depot-level maintenance and repair can be expected to result in reduced total life-cycle costs. The sharing of facilities, either commercial or government, reduces overhead costs. To ensure the Air Force leverages the full benefit of a public-private partnership, the Air Force is pursuing several initiatives, including

- implementing partnering agreements early in the acquisition cycle for new systems and equipment;
- incorporating partnership agreements into current acquisition programs;and
- adding partnering as an evaluation factor in the source selection process.

By taking an enterprise approach to the depot planning and programming process, the Air Force can accomplish an integrated approach for making product support decisions and investing in its organic depot infrastructure, equipment, and human capital over the long term. Enterprise management shifts the focus of Air Force decision making from a program-centric to an enterprise-wide perspective to promote commonality and consistency across weapon systems and organic depots. Strategic planning at the enterprise level rests on the foundation of the core process or SORAP and allows the Air Force to identify opportunities earlier and make better long-range investment and partnering decisions.

The Air Force depot maintenance strategic planning process addresses the three components of world-class maintenance operations capability: workforce, processes, and infrastructure. Each component is central to this strategy.

Workforce

Reductions-in-force throughout the last decade altered the age distribution of the depot workforce, skewing it heavily toward the “greater than 45 years old” demographic. To leverage the knowledge and skills of the current workforce, a new and younger workforce must be hired and trained prior to the loss of the highly skilled workers who are nearing retirement. In addition, the Air Force must ensure depot maintenance managers have the skills to manage in the dynamic environment of depot maintenance, and therefore must increase its investment in both technical and managerial training.

Process Improvements

The Air Force must make process improvements to its business practices to ensure its depot maintenance operations are as effective and efficient as possible. eLog21, Lean, Six Sigma, and simulation and modeling, in addition to benchmarking, are the principal methods for process improvement at the depots.

- **eLog21** is the Air Force transformation campaign plan to improve logistics to meet both current and future threat environment. It is a strategy that guides key logistics transformation initiatives to realize expeditionary logistics. eLog21 will combine corporate business principles with 21st century concepts and capabilities to create a new systems architecture and workforce that will exploit our nation's total capabilities in the most cost-effective manner. The result is a seamless transition between peacetime and wartime logistics processes.
- **Lean** is an innovative approach pioneered in the 1980s by Japanese automakers as a way to focus on cutting waste to avoid cost while improving output. Lean focuses on eliminating "non value added" motions in work processes.
- **Six Sigma** is a set of statistical and management tools. Six Sigma applies statistical tools to raw data to provide information that leads to process improvements. Six Sigma concentrates on eliminating defects, reducing variation, and improving quality.
- **Simulation/Modeling** is the execution of a model of the operations of some real system (e.g., the day-to-day operation of a bank, the running of an assembly line in a factory, the staff assignment of a hospital) with the purpose of providing insight into implications of change with respect to time and throughput without incurring the costs of experimenting with real systems.
- **Benchmarking** is the process by which the Air Force identifies candidate processes for improvement, finds and adapts best practices, and then establishes comparative metrics with best-in-class entities. Headquarters Air Force Materiel Command (HQ AFMC) is benchmarking production, financial, quality, and safety processes, both externally and internally.

Management offices have been set up at all three air logistics centers (ALCs), and teams are actively improving processes using a mixture of benchmarking, Lean, Six Sigma, and simulation methods. The teams are focused in the short term on processes that are stable but deficient in key performance categories. Completed, in-work, and future external benchmark documentation templates are posted on shop floors where the process exists.

In the long term, HQ AFMC plans to implement measurement and process improvement software tools that measure all levels using a standard stoplight alert measure. The expected outcome is to institutionalize improvements and stabilize the process. Sources of variation and processes that are of no value are eliminated. Expected results are a dramatic improvement in floor space utilization, reduced work-in-process (WIP), reduced flow days, increased on-time delivery (meeting the schedule), and increased productivity.

Infrastructure

World-class maintenance and repair operations require world-class facilities and equipment. The depot maintenance strategy is to provide Air Force depots with well-maintained, environmental regulation-compliant, efficiently configured, and properly equipped facilities to support existing depot maintenance workloads. The strategy also postures the Air Force to utilize new technologies to support existing workloads and to support new weapon system technologies. This requires a major capital investment. The aerospace industry benchmark for capital expenditures is approximately 6 percent of total sales, which is significantly higher than the Air Force's historical investment rate of 3 percent of total sales. The Air Force strategy for capital investment is to invest in infrastructure at a level commensurate with private industry.

Strategy for Maintaining Core Logistics Capability

Core determination is based on the essential requirement for the Air Force to maintain a ready and controlled source of organic technical competence to ensure effective and timely response to national defense contingencies and emergency requirements. The first step in evaluating requirements is to measure how much capability, and of what kind, is required. Since the early 1990s, the DoD core concept has employed a methodology designed to determine which depot maintenance capability must be maintained in organic depots to meet readiness and sustainability requirements for the weapon systems supporting the contingency scenarios of the Joint Chiefs of Staff. Core capability is composed of human resource skills, facilities, and equipment assessed and grouped within technology areas. The Air Force calls these technology areas technology repair centers (TRCs). The Air Force has 34 TRCs. Some examples of TRCs are landing gear, airborne electronics, engines, instruments, and cargo/tanker aircraft. Incorporation of new technology into core capability is a part of the determination. Essentially, resource requirements to support normal, contingency, and wartime operational requirements are identified through the core process.

Given limited resources, the Air Force must properly position depot capabilities by focusing on those requirements that are most important operationally as well as those requirements where the Air Force possesses unique capabilities. The Air Force places priority on the most critical surge and warfighting requirements, and accepts more risk in areas where there is widespread commercial capability and the government offers no unique value. Ultimately the Air Force tailors capabilities to priorities and to tasks that the Air Force is uniquely suited to do, and does well. For example, the focus on maintenance of fighter engines reflects a unique core specialty of the Air Force. Alternatively, the Air Force does not duplicate organic capability for high bypass commercial turbofan engines, which are essentially commercial derivatives and for which there is wide spread commercial capability to support Air Force needs. Carefully analyzing and prioritizing any capability "gap" or modernization proposal between requirements and capacity ensures investments are focused on the things that are most important operationally and for which the Air Force is uniquely suited.

The Air Force assesses current and future core requirements and then matches them to the current and planned capabilities and capacity of the organic depots. The methodology identifies shortfalls or "gaps" in current and planned capabilities/workloads and assigns priorities. The gaps are then assessed through other strategic planning processes (i.e., what can be achieved

through partnerships, what process improvements might help offset investment, what legislative relief is needed, and what is potentially affordable.) For example, within the commodities area, the instruments TRC needs additional core capabilities. Repair of instruments on the F/A-22, C-17 and F-35 (Joint Strike Fighter) have been identified to fill this shortfall. The resulting roadmap by weapon system platform best meets Air Force objectives within the bounds of operational risk and affordability.

In addition to sustaining core needs, the Air Force must also consider additional workloads needed to make depot facilities more efficient and effective in enabling rapid and flexible support of operational contingencies. For all additional depot-level maintenance and repair requirements, the Air Force uses a best-value analysis for allocating responsibility for workload accomplishment. The Air Force must account for “last source” capabilities that industry will not provide because the work is old, low-volume, and unprofitable. This includes workloads generated by recent consolidations of repair facilities within DoD and by interservice, interagency, or foreign military sales. Sufficient capability to provide a credible competitive alternative as determined by best value or formal competitive awards must also be retained. These additional requirements are what the Air Force considers core-plus.” Core-plus is critically important, ensuring organic depot maintenance capability complements core and assisting the Air Force with 10 U.S.C. 2466 (i.e., the 50/50 statute) compliance.

Revitalizing the Depot Maintenance Workforce

Some of the major challenges facing the depots are the aging workforce and the ability to recruit, hire, and retain specific depot maintenance skills in a highly competitive labor market. Reductions-in-force throughout the previous decade altered the age distribution of the depot workforce, skewing it heavily towards the “greater than 45 years old” demographic category. A new and younger workforce must be acquired and trained prior to the loss of the highly skilled workers who are nearing retirement to leverage their knowledge and skills. In addition, the Air Force must ensure depot maintenance managers have the skills to manage in the dynamic environment of depot maintenance, and therefore must increase its investment in technical and managerial training.

Reengineering Strategies

The Air Force is establishing formal programs for continuous task review to identify tasks that can be accomplished by anyone with basic technical skills (thereby improving flexible and efficient task assignment) and tasks that can be completed by candidates for cross-training or multiple-skilled specialists. These task reviews, in turn, reveal requirements for updated or advanced technical training for the depot maintenance workforce.

New technology training requirements are being addressed primarily through partnerships with industry, technical schools and colleges, and Air Force/DoD laboratories. Joint use facilities and equipment provide the latest training activities. Improved training methods (e.g., computer-based training) are being introduced along with technical data innovations that use digital presentation and access to enhance hands-on proficiency training for new systems and technologies.

Replenishment Requirements

Table V-1 shows the predicted annual attrition due to retirements, and the projected annual new hires for the depot maintenance workforce. Attrition projections for the out years are based on the number of current employees becoming eligible to retire in the years identified. However, history shows that not all will retire as soon as they become eligible. With an aging workforce, the likelihood of this happening in the out years increases, especially in the blue-collar world. The number of employees retiring in 2009 is expected to decrease because most were hired as FERS employees and must work longer than CSRS employees to reach retirement eligibility.

Table V-1. Depot Maintenance Attrition and Hiring

	Actual	Projected					
	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009
Attrition							
White collar	407	304	307	267	267	268	268
Blue collar	785	856	877	825	832	847	707
Total	1,192	1,160	1,184	1,092	1,099	1,115	975
Hiring							
White collar	405	396	298	234	219	213	178
Blue collar	867	1162	691	860	995	926	786
Total	1,272	1,558	989	1,094	1,214	1,139	964

Replenishment Strategies

A formal apprenticeship program for maintenance technicians that ensures a homegrown cadre of skilled craftsmen has also been initiated at each ALC. These apprenticeship programs may also be enriched with training that leads to Federal Aviation Administration (FAA) certification and complements achievement of Air Force Operational Safety, Suitability, and Effectiveness objectives.

The Air Force's depots work with local technical schools and community colleges to develop school-to-work technical education programs, featuring part-time cooperative and intern positions, which lead to full-time apprentice positions in the depot maintenance workforce. Examples of such programs are the Student Career Experience Program (SCEP) at Hill AFB, and the vocational/technical (VO-TECH) student training program at Robins AFB. These programs have been used extensively as a training ground for our blue-collar workforce. They are an excellent source for hiring enthusiastic students who plan to stay in the workforce for many years.

Air Force depots are also using the Delegated Examining Authority (DEU) to hire white-collar workers at the entry level and blue-collar employees at the journeyman level. Also used for recruiting purposes is the Palace Acquire Intern Program (used for white-collar jobs), which provides the ALCs with recent college graduates who may have a fresh outlook and the willingness to take on new initiatives and make improvements to old processes.

Finally, the Workforce Transformation Team has established a separate depot maintenance training organization at each ALC to provide maintenance orientation and technical training for new hires and maintenance first-line supervisory training. A maintenance professional development course is also in development. The transformation office is looking at the appraisals and awards system and exploring methods to improve the responsiveness of the hiring process. The sum of these efforts should allow the Air Force to ensure access to a technically competent workforce over the long term.

Summary

The Air Force requires a robust depot-level maintenance and repair capability to support its air and space force of the 21st century. That capability relies on a seamless integration of public- and private-sector competencies, achieved through an increased reliance on public-private partnering on new and existing weapon systems. To support its portion of the partnership, the Air Force continues to maintain and improve its world-class organic maintenance, repair, and overhaul operations to ensure they are sized to support operational requirements in times of peace and war. This requires resolution of reduced infrastructure investments during the past decade, and a move to a sustained level of investment that is commensurate with private industry. It also requires an investment in the Air Force's organic depot maintenance workforce, as well as process improvements in the Air Force's business practices as outlined in the Air Force's Depot Maintenance Master Plan.

Expected outcomes of the Air Force Depot Maintenance Strategy include a highly qualified workforce, improved maintenance production throughput, improved maintenance production quality, a properly sized infrastructure, reduced cost, elimination of execution year bills and compliance with law. Each of these outcomes are monitored, measured and reported by and to the highest levels of the Air Force.

The details required to achieve the Air Force's overarching objectives and implement this strategy can be found in the Air Force Depot Maintenance Master Plan. The strategic planning process includes an annual review of capability needs; the plans to achieve those capabilities; the efforts to achieve a world-class workforce, workplace, and processes; and any legislative or policy changes required to implement our master plan. The Air Force corporately measures the improvements of each depot through internal and external benchmarking and process improvement metrics.

The result of implementing this strategy allows the Air Force to maintain its depot-level maintenance and repair capability for which *no one* comes close.

Appendix A—Report Request

Extract from the *Report of the House of Representatives' Committee¹ on Armed Services on the National Defense Authorization Act for Fiscal Year 2004*:

The committee understands that the Department of Defense has taken initial steps to develop a long-term public sector depot maintenance strategic plan. This initiative is critical and the committee encourages the Secretary of Defense to continue its review. This review should include an evaluation of future workload, to include workload projections through fiscal year 2009, and how the Department of Defense shall maintain a core logistics capability to perform the workload. The review should also contain a workforce revitalization plan in light of the size of the retirement-eligible workforce.

The committee directs the Secretary of Defense to submit this report no later than November 1, 2004, to the House Committee on Armed Services and the Senate Committee on Armed Services.

¹ House of Representative Report 108-106, May 16, 2003, p. 304.

Appendix B—Abbreviations

AAA	U.S. Army Audit Agency
AAV	Amphibious Assault Vehicle
AFAST	Aviation Financial Analysis Support Tool
AFB	Air Force Base
AFMC	Air Force Materiel Command
AIT	Automatic Identification Technology
ALC	Air Logistics Center
ANAD	Anniston Army Depot
ARGCS	Agile Rapid Global Combat Support
ARNG	Army National Guard
ASA(ALT)	Assistant Secretary of the Army (Acquisition, Logistics, and Technology)
ASD	Acquisition Supportability Document
ATE	Automatic Test Equipment
AVCRAD	Aviation Classification Repair Activity Depot (assigned to ARNG)
AVDS	Air-cooled, V-engine, Diesel, Super turbocharged
BCA	Business Case Analysis
BFV	Bradley Fighting Vehicle
BRAC	Base Realignment and Closure
BVA	Best Value Analysis
CBM	Condition Based Maintenance
CCAD	Corpus Christi Army Depot
CDA	Core Depot Assessment
CIP	Capital Investment Program
CITE	Center of Industrial and Technical Excellence
CLS	Contractor Logistics Support
CNAF	Commander, Naval Air Forces
CNO	Chief of Naval Operations
COCO	Contractor-Owned Contractor-Operated
COI	Community of Interest

CONUS	Continental United States
CSRS	Civil Service Retirement System
DAAO	Defense Applicant Assistance Office
DCS I&L	Deputy Chief of Staff, Installations and Logistics
DEU	Delegated Examining Authority
DLA	Defense Logistics Agency
DLH	Direct Labor Hour
DLMS	Defense Logistics Management Standards
DLSOR	Depot-Level Source of Repair
DMA	Depot Maintenance Activity
DME	Depot Maintenance Enterprise
DMOPS	Depot Maintenance Operations Planning System
DoD	Department of Defense
DSOR	Depot Source of Repair
DUSD(L&MR)	Deputy Under Secretary of Defense for Logistics and Materiel Readiness
EFV	Expeditionary Fighting Vehicle
eLog21	Expeditionary Logistics for the 21 st Century
ERP	Enterprise Resource Planning
FAA	Federal Aviation Administration
FERS	Federal Employee Retirement System
FRA	Forward Repair Activity
FRP	Fleet Response Plan
FY	Fiscal Year
FYDP	Future Years Defense Program
GAO	Government Accountability Office
GCSS	Global Combat Support System
GOCO	Government-Owned Contractor-Operated
GWOT	Global War on Terrorism
HEMTT	Heavy Expanded Mobility Tactical Truck
HQ AFMC	Headquarters, Air Force Materiel Command
HQMC	Headquarters, U.S. Marine Corps
I/D	Intermediate/Depot

ICS	Interim Contractor Support
IDP	Individual Development Plan
IED	Improved Explosive Device
IMC	Integrated Maintenance Concept
ISO	Common short name for the International Organization for Standardization
JCS	Joint Chief of Staff
JDMST	Joint Depot Maintenance Strategy Team
JSF	Joint Strike Fighter
LEAD	Letterkenny Army Depot
LSE	Logistics Support Element
LSI	Lean Shipbuilding Initiative
LVS	Logistics Vehicle System
MANTECH	Manufacturing Technology
MCB	Marine Corps Bulletin
MEAP	Maintenance Exchange Apprentice Program
MEF	Marine Expeditionary Force
MIS	Management Information System
MLRS	Multiple Launch Rocket System
MPF	Maritime Prepositioned Force
MRP	Manufacturing Resource Planning
MS/MO	Multi-Ship, Multi-Option
MSC	Major Subordinate Command
MTBF	Mean-Time-Between-Failure
NATO	North Atlantic Treaty Organization
NAV2030	Navy Ashore Vision 2030
NAVAIR	Naval Air Systems Command
NAVRIIP	Naval Aviation Readiness Integration Improvement Program (NAVRIIP)
NAVSEA	Naval Sea Systems Command
NCMS	National Center for Manufacturing Sciences
NDE	Non-Destructive Evaluation
NDI	Non-Destructive Inspection
NMCS	Not-Mission-Capable-due-to-Supply

NMP	National Maintenance Program
NSPS	National Security Personnel System
NSRP	National Shipbuilding Research Program
NSY	Naval Shipyard
OASA(ALT)	Office of the ASA(ALT)
OEF	Operation Enduring Freedom
OEM	Original Equipment Manufacturer
OIF	Operation Iraqi Freedom
OJT	On-the-job Training
ONR	Office of Naval Research
OPNAV	Office of the Chief of Naval Operations
OPTEMPO	Operating Tempo
OSD	Office of the Secretary of Defense
PBA	Performance Based Agreement
PBL	Performance Based Logistics
PEO	Program Executive Office(r)
PM	Program/Project/Product Manager
PMO	Program Management Office
PPP	Public-Private Partnership
PSI	Product Support Integrator
PSP	Product Support Provider
RAM/RS	Reliability Availability Maintainability – Rebuild to Standards
RCM	Reliability Centered Maintenance
RCT	Repair Cycle Time
RFID	Radio Frequency Identification
RFP	Request for Proposal
ROC	Recruitment on Campus
RRAD	Red River Army Depot
RSMS	Readiness Sustainment Maintenance Site (assigned to ARNG)
SAMP	Single Acquisition Management Plan
SCEP	Student Career Experience Program
SEE	Small Emplacement Excavator

SHIPMAIN	Ship Maintenance
SIPT	Supportability Integrated Product Team
SMAW	Shoulder-Launched Multipurpose Assault Weapon
SNT	Serial Number Tracking
SOCOM	U.S. Special Operations Command
SOR	Source of Repair
SORAP	Source of Repair Assignment Process
SPAWAR	Space and Naval Warfare Systems Command
T/M/S	Type/Model/Series
TAT	Turn Around Time
TMDE	Test Measurement and Diagnostic Equipment
TOC	Theory of Constraints
TOW	Tube-Launched Optically-Tracked Wire-Guided
TRC	Technology Repair Center
TYAD	Tobyhanna Army Depot
UID	Unique Identification
USAMC	U.S. Army Materiel Command
USATA	U.S. Army TMDE Activity
USC	United States Code
VERA	Voluntary Early Retirement Authority
VO-TECH	Vocational-Technical
VSIP	Voluntary Separation Incentive Payment
VTC	Video Teleconference
WIP	Work In Process
YOS	Years of Service

