Center for the Management of Science & Technology
University of Alabama in Huntsville

Performance Based Logistics

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TABLE OF CONTENTS

LIST OF TABLES & FIGURES

EXECUTIVE SUMMARY

Introduction

The U.S. Army Aviation Missile Command (AMCOM) task the Center for the Management of Science and Technology (CMOST) at the University of Alabama in Huntsville (UAH) to identify military and commercial initiatives and lessons learned for transition to Performance Based Logistics (PBL).

Objectives

The objective of the PBL research is to identify best practices, evaluate the gaps that exist between the best practices and AMCOM's current plans and processes, and to make recommendations for aligning those plans and policies to meet PBL requirements, in accordance with DOD Directive 5000.1, "The Defense Acquisition System, dated May 12, 2003.

Definition of PBL

We reviewed existing definitions of PBL in the Navy, Air Force, Army and industry. We subsequently defined PBL for the purpose of the study:

> A*n integrated acquisition and sustainment strategy for enhancing weapon system capability and readiness, where the contractual mechanisms will include long-term relationships and appropriately structured incentives with service providers, both organic and non-organic, to support the end user's (warfighter's) objectives.*

Methods

After a review of PBL literature, we conducted in-depth interviews with personnel at 15 of the 30 DoD pilot programs established in 1999 to test innovative product support practices. In addition, we interviewed personnel from other DoD programs and the private sector for lessons learned from logistics modernization.

We segmented the findings as follows:

- Organizational Culture and Change,
- Organizational Alignment,
- Financial Management
- Contracting and Performance Agreement Management, and
- Technology Management.

Organizational Culture and Change

A constant theme throughout the PBL research was the necessity for change to the culture of the implementing organization. The key components of a successful change management strategy include: the motivation of change agents, incentives for employees, empowerment of employees, and communication to employees.

To successfully implement PBL, the government must have the ability to obtain goods and services while allowing partners to perform, without dictating the methods of performance. The same is required of employees. In order to achieve this, however, employees must be educated and have the ability to act.

Culture is important in helping to create the right environment. Before the organization can move forward with change the culture must be developed to support the anticipated changes.

Organizational Alignment

In our just-in-time world we must have the ability to respond to customers' requirements in ever-shorter lead times. Dell Computers is a leading example of winning competition on the basis of supply chain performance. To achieve a similar position, organizations must alter the roles of functional departments (purchasing, supply, resource management, etc.) and establish broad-based integrators who are oriented toward success based upon managing processes and people that deliver superior service.

Six of the best practices for moving to these new organizational structures are:

1. Assign responsibilities clearly throughout the firm,
2. Design metrics to motivate the right behavior,
3. Manage failures to limit disincentives for risk-taking,
4. Develop a supportive organizational context for tools,
5. Manage relationships with stakeholders, and
6. Benchmark to promote continuous improvement.

Ultimately the challenge for AMCOM is to find a way to deliver the required level of service to the PEO community.

Financial Management

Financial management policy is often identified as a barrier to PBL implementation. The restrictions on the use of Operations and Maintenance funds, expiration of funds, and the traditional flow of funds through the operation commands to buy support on a transaction bases are all mentioned. Existing financial processes support functional stovepipes and are viewed as inhibiting needed integration to improve customer service.

While the Defense Working Capital Funds operate under the same rules across DoD, a perception exists that the operation of the funds varies from service to service. The AWCF, NWCF and AFWCF vary in the types of activities covered and the amount of money in the respective funds. Navy and Air Force WCF are almost five times as large as the AWCF and may explain why the Army is alone in its concerned about locking a large percent of the funds into "must pay" PBL contracts.

To be competitive an organization must know the **true cost** of its internal operations. In a service organization the biggest expense is labor. How an organization is structured and how efficiently the workers produce a service determines profit, or in the language of the WCF, net operating results.

The NWCF and the AFWCF activities are heavily involved in strategic sourcing initiatives and expect to produce savings through actions such as A-76 competitions and functionality reviews. No mention is made of AWCF savings from these same competitions and reviews.

DoD efforts are underway to reengineer financial processes to allow more flexible, program-centered financial approaches. A DWCF Task Force is examining current policy and OSD (Comptroller) is approving new ways to allow greater flexibility in funding product support.

Contracting and Performance Agreement Management

Private sector companies like Caterpillar and Dell use contracts and partnerships to create a virtual organization. Dell has more than 150 vendors, 30,000 field technicians worldwide, and 3,600 technical support personnel. Dell's global reverse logistics network involves an exchange of millions of spare parts between supply chain participants, utilizing business processes and a 'World Chain' automation system. Caterpillar uses a contract management system, supported by a CAT inventory control system, to monitor supplier performance.

In the PBL environment *relationships*, not terms and conditions, make contracts work effectively. It is when the relationship doesn't work that the terms and conditions matter. All of the program managers we interviewed wanted to discuss the relationship aspects of their contract arrangements. There was little discussion on how the mechanisms for contracting have changed except for the use of 'alpha' contracting. This

is where government and contractor representatives review/analyze/agree on the elements of the proposal as it is developed. These meetings take place after an Industry Day is held. The objective is to avoid the typical sequential time-consuming process and to make sure all requirements are addressed without misinterpretation.

With PBL, the traditional functions of the government are shifted to the contractor without giving up the "core" capabilities. The government's overriding concern is that it will lose certain existing capabilities if product support services are performed by contract.

We provide an outsourcing decision matrix, based on the relationships between products, service providers, and logistics managers, with a continuum on the dimensions of risk, complexity and uncertainty.

Technology Management

The consensus for weapon system technology management is 1) the OEM has an advantage early in the development/fielding cycle of the system and 2) technology insertion/obsolescence is also best managed by the OEM.

Another aspect of technology management is the design and use of integrated information systems. Leading commercial organizations have recognized that the key to success in logistics is the extension of the information system beyond the classical dimensions of planning and control to a virtual 'marketspace'[1] of electronic commerce.

PBL requires the real-time monitoring and sharing of information across government and contractor information systems. DoD established requirements to implement an integrated product data environment (IPDE). DLA is using the implementation of its Business System Modernization technology as a way to bring commercial best practices into the logistics operation. The Army's Logistics Modernization System is also adopting best commercial business practices and associated technologies to form new, modern enterprise resource planning (ERP) business automation tools.

UPS and Caterpillar are leveraging information technology and transportation knowledge into new companies — Supply Chain Solutions. They make use of their networks to help clients integrate their fragmented operations, reduce costs and increase effectiveness.

Gap Analysis

We identified six major gaps between AMCOM 's business operation and the best practices from Defense and industry. They are the need to:

1. Embrace a "customer oriented" culture.

2. Fully understand costs.

3. Understand how to appraise the opportunities for PBL implementation.

4. Use the appropriate incentives to motive the appropriate behavior.

5. Know how much control to retain, and

6. Proactively manage technology change by using resources wisely.

Recommendations

To fill these gaps, we recommend AMCOM pursue the following implementation strategies.

1. Baseline the current culture with respect to customer orientation and implement a plan to improve it.

2. Investigate the cost model used by General Babbitt in his reorganization effort at the AFMC and implement a model suited to AMCOM's needs.

3. Create an organization whose primary function is to investigate methods for identifying attractive alternatives to existing methods of providing services.

4. Initiate frank discussions with key stakeholders (contractors and organic organizations) to understand their needs, then implement an incentive structure or internal processes to meet those needs.

5. Assess the risks involved in doing business the PBL way and decide on the level of control management is willing to accept.

6. Develop an opportunity index for the selection of PBL projects similar to the Navy model.

SCOPE OF THE PROJECT

The Center for the Management of Science and Technology (CMOST) at the University of Alabama in Huntsville (UAH) was tasked to:

1. Research the existing PBL initiatives with the Army, Air Force, Navy, and Industry,

2. Review lessons learned from existing and pilot programs,

3. Develop a gap analysis between the current Army programs and best practices in the services and industry, and

4. Develop a transition plan to move to PBL.

This analysis will allow AMCOM leaders to determine if current organizations and workforce skills will support PBL and meet the evolving needs of the PM community while supporting standard AMC/AMCOM business systems and processes.

This report is divided into five sections to match the results of our findings. First, however, we will discuss the drivers of PBL and formulate a definition of PBL.

DRIVERS OF PBL

We analyzed the following areas: the performance environment currently driving major government and industry organizational changes, regulatory and political trends that might significantly impact AMCOM future programs, performance-based acquisition, performance agreements with organic providers, development and measurement of performance, working capital funds management, and the impacts of technology on weapons systems and product support.

From this analysis we identified the main drivers (primary reasons to adopt PBL) listed in Table 1. In all cases, these drivers are a map to the changes necessary to make the implementation of PBL successful.

The key points are that new and legacy weapon systems are:

1. Expensive to maintain,

2. Difficult to upgrade with new technology and

3. Take a long time to deploy to the field.

The new acquisition regulation requires the incorporation of sustainment decisions in the early phases of the acquisition cycle. It is only through proactive measures that future

efforts to sustain, modernize and manage technology obsolescence will be more successful and less costly.

All drivers indicate the need for improved business practices to keep pace with the commercial sector. This requires the development of new methods, new incentives, and a new view of government/contractor relationships.

DRIVERS FOR PBL
1. Rising cost of maintenance, operations and support for new and legacy missile systems
2. Needed tool for Logistics Transformation and other actions required by Congress[2]
3. Needed reduction of customer wait time in support of the warfighter
4. Needed modernization of weapon systems to enhance combat capability
5. Needed solutions to weapon obsolescence problems
6. Documented savings from commercial logistics support operations
7. Documented improvements from implementation of performance based acquisition

TABLE 1: DRIVERS FOR PBL

DEFINITIONS

We found no single definition for PBL; however the common theme is the need for an integration of acquisition and logistical functions for the life cycle of the total system. A large part of this integration requires that incentives be used to ensure success rather than the existing practice of attempting to define specific methods of operation. The incentives are based on measurable ways to improve performance and/or reduce cost.

The official definition from The Deputy Under Secretary of Defense for Logistics and Materiel Readiness is:

> "Performance-Based Logistics (PBL): An integrated acquisition and logistics process for buying weapon system capability that delineates outcome performance goals of weapon systems, ensures that responsibilities are assigned, provides incentives for attaining these goals, and facilitates the overall life-cycle management of system reliability, supportability, and total ownership costs. Depot-level maintenance may be a part of life-cycle management requirements."

The Navy uses the term "provider" to show that functions can be performed by various entities. The Navy definition also includes the term "empowered," implying the additional power in decision making granted to the provider.

> "A long term agreement where the provider is incentivized and empowered to meet customer oriented performance requirements

> (reliability, availability, etc.) in order to improve product support effectiveness while reducing total ownership costs."

The Army elevates PBL to a strategy. While not focused on the customer, per se, the definition does link PBL efforts to the purchase of *readiness*.

> "A strategy for weapon system product support that employs the purchase of support as an integrated performance package designed to optimize system readiness. It meets performance goals for a weapon system through a support structure based on performance agreements with clear lines of authority and responsibility."

The Air Force does not use the term PBL. Instead the AF uses Total System Support Responsibility (TSSR), Total System Performance Responsibility (TSPR), Flexible Sustainment, and Total Life-Cycle System Support. AF programs focus on system wide support to provide total system sustainment and system level readiness.

Industry uses the term *Supply Chain Management (SCM)* to describe efforts similar to PBL. In the private sector many of the logistical support functions are outsourced under inclusive contracts for an identified level of service and performance. High technology products require sophisticated systems and exact specifications. This industry strives to use a value chain model that allows for customization of the customers' products, thus SCM becomes a competitive advantage in the marketplace. Often the items that require on-going logistical support and repair are outsourced with a third party managing the entire process.

Taking all of the above into consideration, we define PBL as:

> *An integrated acquisition and sustainment strategy for enhancing weapon system capability and readiness where the contractual mechanisms will include long-term relationships and appropriately structured incentives with service providers, both organic and non-organic to support the end user's (warfighter's) objectives.*

PROCESS AND METHODOLOGY

Research Methodology

Our initial discussions with Mr. Flinn, Mr. Bagosian, Dr. Proffitt, Mr. Barker, Mr. Chapman, Mr. Sparks, and Ms. White helped provide us with background information for conducting a number of initial interviews in Huntsville. We compiled the results of the Huntsville interviews and started to develop a basic understanding of PBL.

The first step was to locate and read PBL related literature. After a review of the literature, we established categories, such as Army, Navy, Air Force, and Industry, and

identified people and programs engaged in PBL-type activities. We provide a list of the individuals interviewed in Appendix I.

We conducted in-depth interviews with government and industry officials, from contractors to DoD project managers. Most interviews took several hours to complete. We interviewed at Warner Robins Air Force Base, Wright Patterson Air Force Base, Naval Inventory Supply Point in Philadelphia, and at PBL Conferences. We used each interview to document and investigate how PBL is defined and working. We also conducted telephone interviews with HQ Navy, GAO, DLA, Rand and some contractor program managers.

In order to facilitate an open dialogue with the Huntsville Defense community, we hosted two roundtable discussions: one on PBL and one on Lean Logistics. We also participated in an AMC-wide PBL video conference at AMCOM.

We followed an emergent design process for interviews. In an emergent interview design, a predetermined set of questions is used to start the interview process. As the interview proceeds and as the investigators learn from each interview, the set of questions is altered to reflect the learning that has taken place.

Each person was informed that the purpose of the research was to assist AMCOM in making the transition to a PBL environment. In general, there was a very high level of cooperation at all levels. Government and contractor personnel seemed more than willing to talk freely about their experiences with PBL, their working relationships with others inside and outside their organization, their vision of the future PBL environment and its likely effects on their organization. What they considered to be the strengths and weaknesses of PBL as compared to other forms of doing business. They were extremely forthcoming with information about decision making, their efforts at implementing PBL for legacy and new systems, and in obtaining political support.

Our literature search revealed that in 1998 DoD established thirty sustainment pilot programs, of which twenty-four adopted innovative product support strategies.[3] We contacted project managers from the pilots to schedule interviews. Table 2 lists the thirty initial programs and highlights the programs interviewed by the CMOST research team.

DoD Pilots for Product Support Strategies		
Army	**Navy**	**Air Force**
Abrams M-1 Tank	AAAV	AWACS
AFATDA	AEGIS Cruiser	**B-1B Lancer**
Apache AH-64	**ASE/CASS**	**C-17 Globemaster**
Chinook CH-47	Common Ship	**C-5 Galaxy**
Comanche RAH-66	CVN-68	Cheyenne Mountain Complex
Crusader	**EA-6B Prowler**	F-117 Nighthawk
Guardrail/Common Sensor	**H-60 Helicopter**	F-16 Falcon
HEMTT	LPD-17	**J-STARS**
HIMARS	MTVR	**KC-135 Stratotanker**
TOW/ITAS	**SLAM-ER**[4]	SBIRS
Note: AAAV = Advanced Amphibious Assault Vehicle; AFATDS = Advanced Field Artillery Tactical Data System; ASE/CASS = Aviation Support Equipment Consolidated Automated Support System; AWACS = Airborne Warning and Control System; HEMTT = Heavy Expanded Mobility Tactical Trucks; HIMARS = High Mobility Artillery Rocket System; J-STARS = Joint Surveillance Target Attack Radar System; LPD = Landing Platform Dock; MTVR = Medium Tactical Vehicle Replacement; SBIRS = Space-Based Infrared Systems; SLAM-ER = Standoff Land Attack Missile-Expanded Response; TOW/ITAS = Tube-launched, Optically-tracked, Wire-guided Improved Target Acquisition System.		
Highlighted programs were included in the UAH PBL research through interviews or presentations.		

TABLE 2: PILOT PROGRAMS FOR PRODUCT SUPPORT STRATEGIES

In addition to these pilot programs, we interviewed managers from the Soldier Focused Logistics (SFL) program, a collaborative effort between AMCOM and the Cargo Helicopters Project Manager's (PM) Office. This program is using PBL strategies to support the CH-47 fleet sustainment.

We interviewed industry managers from AutoZone, UPS, Target, Caterpillar, Intergraph, Dell Computers, Royal Caribbean Cruises and the University of Toronto. Since the term *Performance Based Logistics* is not used in the private sector, we widened the scope of logistics to include inventory management, spare parts acquisitions, repair and maintenance activities. A report of those interviews is in Appendix III.

FINDINGS

Initial findings indicate the need for top-level buy-in and customized PBL strategies to match customer and system requirements. The Air Force approach is one of "Flexible Sustainment" creating a commercial-like, performance-based support structure with total system support responsibility. The NAVICP is focusing on systems, subsystems and components, translating the requirements of weapon system performance into a sustainment program that optimizes system readiness and total ownership costs. Both support structures are based on performance agreements with clear lines of authority and responsibility for both organic and commercial partners.

Industry focuses on customer relationships to maximize profits, while maintaining core competencies and outsourcing all other functions. Major findings from industry are the following:

1. Provide a single contact point for all logistical support.
2. One size does not fit all; customization is necessary.
3. Partner with the contractor on logistics systems design and operation.
4. Emphasize defining and clarifying performance metrics.
5. Provide both a penalty and incentive clause in contracts.
6. Keep in-house core competencies in logistics support.
7. Develop and use appropriate information systems.

Organizational Culture and Change

Throughout the PBL research, a recurring theme was the necessity for change to the culture of the implementing organization. In Table 3, examples of the "Old Culture" or beliefs are aligned with PBL examples of new ways of doing business.

The AMC HQ, from initial meetings with MSC representatives, identified 21 issues that must be addressed prior to PBL implementation (Issues Table is included in Appendix I). One third of these issues reflect a culture or belief that would not be supportive of PBL implementation.

For example:

- *Guidance is needed to provide the PM/PEO with **guidelines** on interface with the organic community, and*
- *AMC needs to address MSC **interfaces** as they will, potentially, be competing Product Support Providers.*
- *There is a need to select what to maximize–cost efficiency or capabilities, as maximization of **both** is not possible.*
- *The establishment of ground rules for **engaging** PMs to preclude conflicts of interest, contracting, and business challenges, since PMs are no longer under AMC oversight.*
- *There is a need for provisions to elevate **disputes** between the PEO/PM and the PSI/PSP "up the PBL chain of command."*

From the examples and comments included with the issues, the AMC culture appears to be one of:

1. Waiting for HQs' guidance before taking any action;

2. Viewing PM/PEO as combatants to be engaged ("force required engagement of PMs") vs. customers to be served, and an expectation that

3. The chain of command will protect the existence of the MSCs rather than having the customer select the best value supplier.

COMPARISON OF CULTURE EXAMPLES	
"New" Culture	**"Old" Culture**
The C-17 aircraft is the focus of a Boeing – Air Force partnership. They do joint off sites and work specifically on their "relationship." They have joint weekly, monthly, block, etc. meetings and reviews. Every employee who works on the C-17 wears a plastic card the size of their badge, imprinted with partnership agreement signed by Boeing and Air Force leaders.	• Arms length, adversarial relationship between government and contractor • All communications in writing to create an audit trail • Interact as little as possible, conduct bi-annual performance reviews • Maintain objectivity don't get too "close" to the contractor • Contractor driven by "profit motive" vs. nation's defense • Government close holds information
NAVSEA established an e-marketplace using a one-page flowchart showing what it wanted its electronic services procurement system to look like. The five steps represented the "full operating capability" (FOC) of the desired system, with the extensions and clouds being areas for future scalability in the eventual system. The Navy simply handed the flowchart to potential vendors and asked them, "How much of this picture can you deliver and at what price?" (IBM – Seaport Study p. 18)	• Lengthy statement of work developed by government requiring office - with an attempt to document every possible situation, process, regulation, milspec, service, and government expectation for the bidders • Independent government estimates • Elaborate processing of SOW through technical data, system engineering, legal, etc., all with organization-specific word requirements
Air Force Joint Surveillance Target Attack Radar System (JSTARS) Total System Support Responsibility (TSSR) Partnership has multiple agreements in place supporting the sustainment of JSTARS. In most cases, these agreements stand alone-they are not part of the contract between Northrop Grumman Corporation (NGC) and the Air Force. The Partnering Agreement (PA) between NGC and the WR-ALC has been incorporated into the prime TSSR contract as the guiding basis for the Air Force providing the depot-performed workloads to the contractor.	• Finger pointing between government and suppliers over delays and cost increases • RFP describes services and scope of work in great detail • Numerous change orders as soon as work starts and RFP omissions are identified • Government defines service delivery means and process through inclusion of government regulations and directives • Contract administration role vs. partner role • Only acceptable relationship is a contractual one
Sikorsky Aircraft Corporation (SAC) is working side-by-side with Corpus Christi Army Depot (CCAD) to reduce repair/overhaul turnaround time for the H-60. This joint collaboration has improved business processes, depot repair methodology, and more responsive product support, with only four contractor jobs directly attributable to the partnership.	• 'Expert' role assigned to government employees • Use of design specifications where the government tells the contractor *how* to provide the service • Contractors in the government workplace viewed as personal service • Quality assurance processes defined by government specialists • Government employee relies on "guidance" from HQ
The NAVICP has an F/A-18E/F Integrated Readiness Support Teaming (FIRST) prime contract with Boeing under which NADEP North Island performs depot repair services to Boeing as a *subcontractor*. Boeing provides funding, repairable units, repair parts, obsolescence management, and shipping. NADEP North Island provides touch labor, facilities, technical data, equipment, production engineering, and packaging. Fifty-seven government jobs were created or sustained by this partnership.	• Contractors are taking jobs away from government workers • Government is buyer of services, not seller • All payments to government are deposited in the U.S. Treasury account • Private sector cannot use government facilities and equipment to perform work

TABLE 3: CULTURE EXAMPLES

NATURE AND CHARACTERISTICS OF ORGANIZATIONAL CULTURE

Organizational culture is "a pattern of beliefs and expectations shared by organizational members."[5] Generally, the norms stemming from these shared beliefs, expectations and actions strongly shape the behaviors of individuals and groups within the organization. Figure 1 shows the relationships between the content of the culture, the manifestations of that culture, and employee's perceptions and interpretations of that culture. For the most part, this culture is invisible to the employees and their interpretations are viewed as something unique to the individual—their personal opinions. People tend to surround themselves with others of like opinions and values, thus reinforcing their common beliefs and expectations.

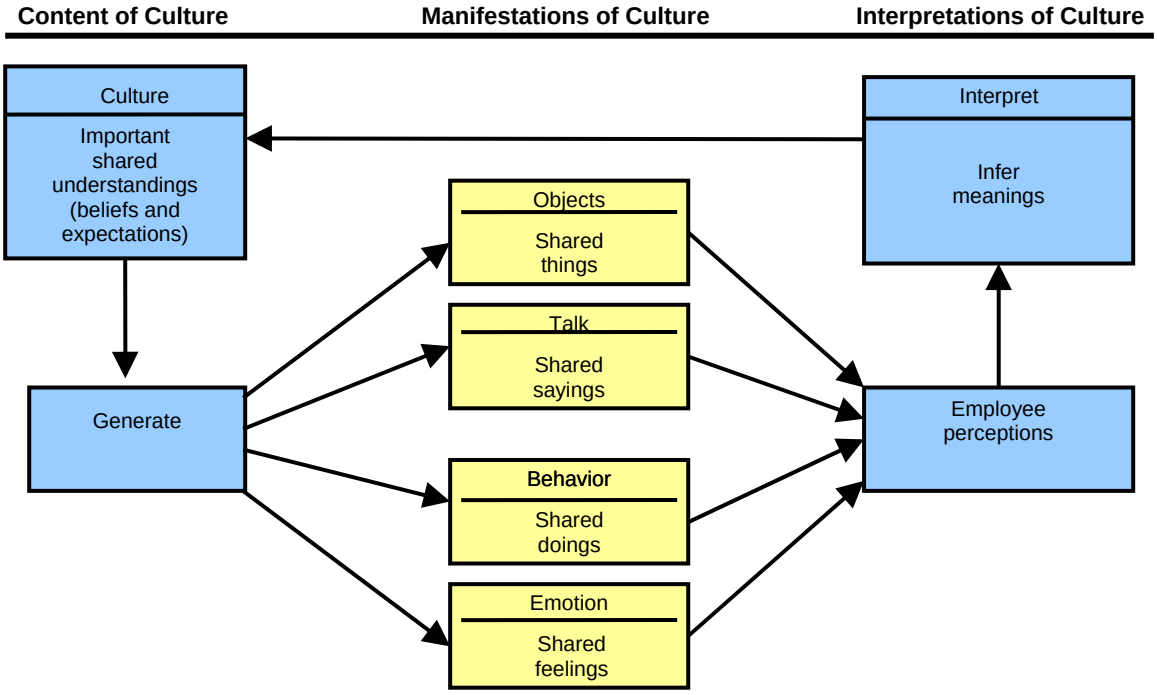


FIGURE 1: CULTURAL RELATIONSHIPS

MAINTAINING AND CHANGING ORGANIZATIONAL CULTURE

The primary mechanisms for both maintaining and changing an organization's culture include:

1. What managers pay attention to, measure and control;

2. The ways managers (particularly top management) react to critical incidents and organizational crises;

3. Managerial role modeling, teaching, and coaching;

4. The criteria for allocating rewards and status; and

5. The criteria for recruitment, selection, promotion, and removal from the organization. [6]

Managers should expect to encounter difficulty in clearly understanding situations that involve change. Analyzing a change problem can become quite complex because of the large number of variables that must be considered.[7]

MANAGING CHANGE

RAND, in a study on changing environment management policy, identified strategies for managing changes. We see them as lessons learned, and applicable to managing the changes necessary for PBL implementation.

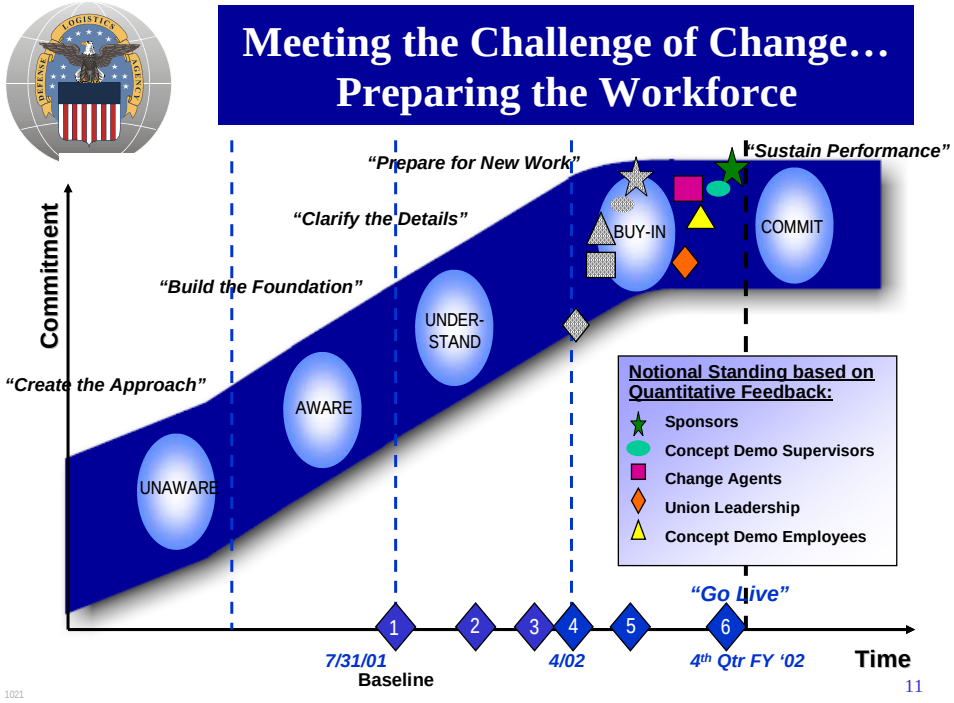


FIGURE 2: DLA PROCESS FOR CHANGE

When change efforts are successful, managers must make the required change an integral part of day-to-day management, with successful implementation no more or less than successful management.[8]

The key components of a successful change management strategy include: the motivation of change agents, incentives for employees, empowerment of employees, and communication to employees.

1. Motivate creative and persistent change agents: "Any effort at change creates resistance. Alternatives to the status quo can threaten people with a vested interest in the current way of doing business, both inside and outside the organization. Alternatives to the status quo may take time and effort to work as well as the status quo does or to achieve as much acceptance among customers. Proactive firms seek ways to overcome these problems at the front line of change itself, one manager at a time. Creativity can provide cost-effective alternatives to the status quo; persistence and motivation are necessary to see the alternatives through to ultimate adoption."[9]

- The Department of the Navy published PBL guidance in 1998. The NAVSUP Command, along with NAVAIR and NAVSEA commanders pushed the PBL concept through the organization. Early on, the leadership recognized and verbalized the benefits of PBL. Managers were challenged to work with suppliers and Navy Depots to develop programs to increase readiness and efficiency in logistics support.

- Culture champions exist throughout DLA to devise transformation activities to close gaps in the culture between today's baseline and its goal of becoming a truly customer-focused organization. (See DLA Best Practices Appendix II)

The former Air Force Material Command (AFMC) Commander, General Babbitt's effort to lead an accounting revolution accomplished the same thing. By continually forcing his managers to re-think their efforts and by not allowing them to continue to perform in the same old manner, he instilled a level of managers that were devoted to cost management. Ultimately, the managers and the Air Force received many benefits from this change.

2. Use incentives to motivate the right behavior: "Metrics can motivate behavior only if linked to incentives. Depending on the culture, incentives target individuals, teams, or organizations."[10] The incentives can be monetary or non-monetary. One effect of giving such awards often, even for small improvements, is to spread the importance of the action taken across the organization.

- One of the benefits of General Babbitt's change management was that managers were now committed to a course of action that they themselves designed. The approach led to increased performance levels of their aircraft. An unintended consequence was that "many had come to value the benefits of the approach including the expanded scope of AFMC's influence of resources within a financial performance framework acceptable to the Air Force."[11] Subsequently, Babbitt's approach was viewed positively by outside agencies. His successor, General Lyles, built on General Babbitt's leadership and continued to support it.

- The Navy's approach led to increased performance levels and a sense of accomplishment for the organization. One vendor commented that initially the warfighter was not convinced that the Navy PBL approach would work. However, as soon as the first promise was kept the skepticism started to abate. As additional promises were kept and performance metrics continued to be exceeded, the warfighter became more comfortable with the approach and the organization exhibited pride in its performance.

To successfully implement PBL, the government must have the ability to obtain goods and services while allowing partners to perform, without dictating the methods of performance. The same is required of employees. In order to achieve this, however, employees must be educated and have the ability to act.

3. Empower employees with formal training: To be successful, training must be designed to accomplish three independent goals. The first is the goal of elevating the perceived importance of what needs to be done, second is training on methods needed to enable the change (value streaming, decision-making, relationship building, metrics, etc.), and third is training to develop the employee to function effectively in the new multi-disciplinary role. Under PBL, the role of the item manager changes and new requirements develop for the decision-making processes. Knowledge of systems theory and behavior becomes a prerequisite for the new logistics manager.

- The GE Engine partnership with the Army is a prime example of how GE is helping depot workers implement new practices to work in process. This evolved from the CCAD partnership with GE. The challenges with getting CCAD up to industry standards are substantial. Changes have to occur in small increments and are still being implemented.

- The Army is using the AMC Fellows program to provide the multi-disciplinary skills needed for the future. The AMC Fellows program is designed for new entry-level employees. Employees complete an 18-month training program designed to give them a Master's degree level education. Upon successful completion of the degree, the employee is assigned a management level position with promotion potential to a GS-13 in the AMC organization.

- FY 2003 was designated as the year of "Logistics Reengineering" at DAU. It includes 1) re-energizing Acquisition Logistics training, and 2) increasing Systems Sustainment Management training. Successful PBL implementation requires training in different ways of doing business and developing true life cycle managers.[12]

The fourth component of successful change management is communication. Throughout our interviews, industry and government representatives stressed the importance of communications.

4. Communicate continuously in all directions: Information about the goals and status of the program is essential to implementing change. To be successful information must be designed to:

- Convey senior leadership's commitment
- Convey knowledge about performance as a whole and assure it reflects strategic goals
- Convey information on successes and maintain the momentum of change
- Convey goals and status to key stakeholders
- Promote active exchange of information

The GE-Army partnership uses constant communication to improve work practices. This best practice is consistently noted in industry and government. Communications are critical and formal mechanisms such as co-location help in achieving common ends. Industry uses co-location to assist with its communications efforts as well. Several managers commented on how contractors were *always available* to discuss issues when they are physically located near them.

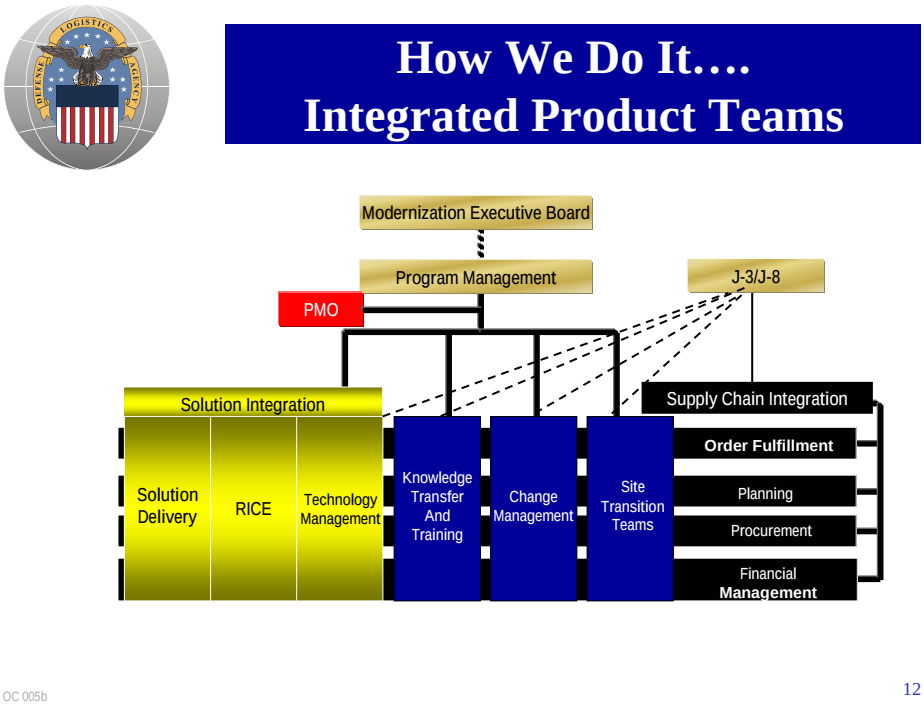


FIGURE 3: DLA ORGANIZATION STRUCTURE FOR IPT'S

The Navy and Air Force employ various tactics to focus on communication channels. Specifically, the AF reorganized several offices in order to include the Chief Logistics Officer within the traditional program management office. The Navy has the Assistant

Program Manager for Logistics (APML) position. Also, in the JSTARS program, the contractor is physically located with government employees and included in all business decisions. Likewise, since the contractor employs government personnel to perform touch labor, communication is an essential element to building team efforts. The co-location of support teams planned for the Soldier Focused Logistics Pilot is an example of shaping the organization structure to facilitate the work requirements. (See JSTARS in Appendix II.)

The Navy emphasizes the importance of communication channels. NAVSUP described the importance of early discussion and understanding by all parties involved with initiating a PBL contract.

In summary, culture creates the environment. Before the organization can move forward with change the culture must be developed to support the anticipated changes. By using a framework with the components to managing cultural change, and examples of how the culture changed at the Navy, AF and other organizations, AMCOM can create a platform for cultural change.

Organizational Alignment

Change in culture is necessary, but not sufficient to enact reforms. The organization's structure and processes also require changes and it is only after organizations are aligned to focus on customers that performance improvements are possible.

In September 2002, GAO issued a report that stated that "DLA does not provide a 'single face' to its customers for addressing their issues." Customers are "sometimes confused over whom to call and reported difficulties with getting in touch with the right person to resolve their problems."[13] GAO recommended DLA create a single face to customers to improve customer satisfaction. DLA has since implemented a customer relationship management (CRM) program to learn more about its customers' needs and behaviors. They have also realigned the DLA organization structure. They now have functional field chiefs reporting to directors at headquarters and established a new Customer Operations Directorate.

The Navy and AF had to re-think the way they do business. The AF organized IPTs with full decision-making capabilities. A good example is the Warner Robins Air Logistics Center (WR-ALC) where 'Stovepipes' (traditional metaphor for functional organizations where support functions are usually vertical and product delivery roles are usually horizontal) and 'Pipelines' (horizontal stovepipes eliminated and merged into one conduit to represent the enterprise process for all products and services) to describe their re-engineering approach.

> "When the process requires organizations to work together, the individual stovepipe logic, rules, and measurements are the primary behavioral drivers. When organizations intersect, they are too often at cross purposes and usually have large amounts of wasted energy, wasted

resources, delays, re-work, and worker de-motivation. The conflict nodes, shown as fires in the figure below, offer the greatest opportunity for a dramatic jump in enterprise performance. Converting conflict nodes to synergy nodes requires re-engineering a new metaphor and a process-driven model measured by throughput to the customers."[14]

A key point: The new horizontal organization must retain the critical contributions of skills, people, and specialized responsiveness, viewed as being the strength of the old structure, when forming a new customer-driven organization.

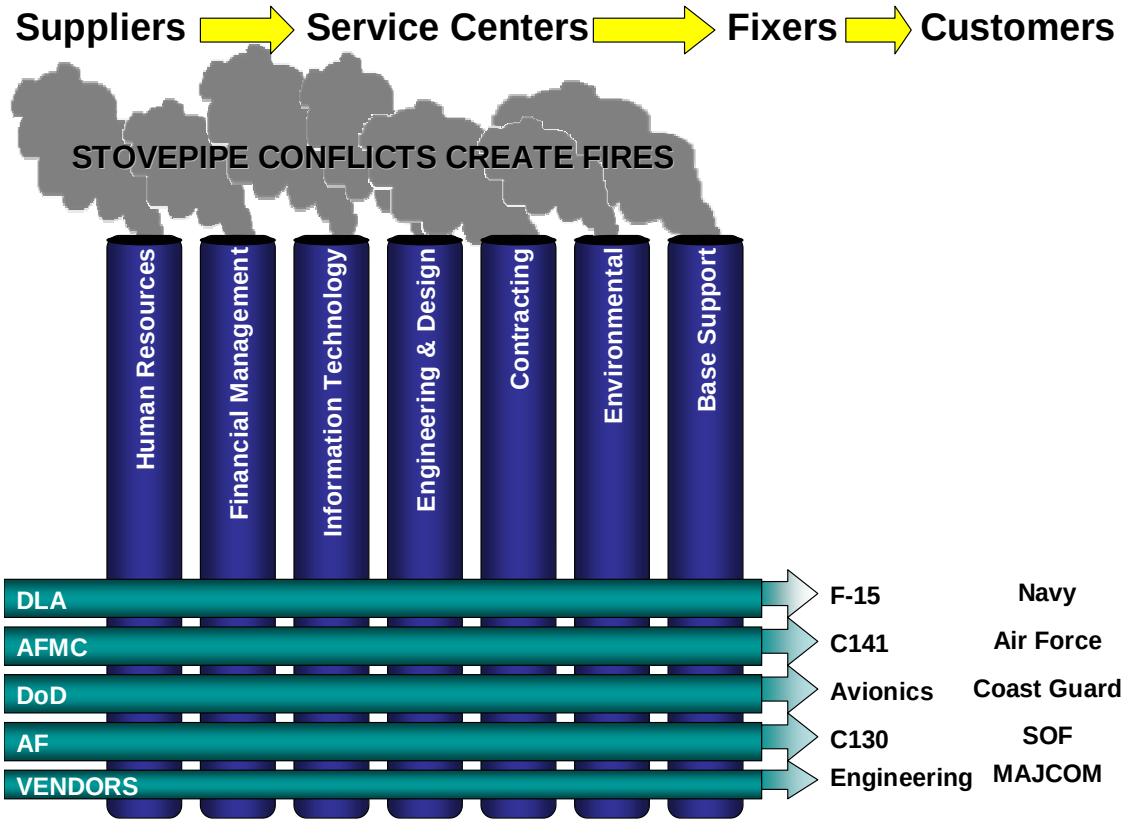


FIGURE 4: WARNER ROBINS

Changes to the organization's functions (structure) are necessary before improvements to the supply chain can be made. In a study of commercial supplier performance management the Aberdeen Group[15] found that approximately 60 percent of surveyed organizations identified difficulties in consistently measuring and managing supplier performance as the biggest hurdle to supply chain improvements. Companies that have succeeded in applying consistent measures and procedures improved supplier performance by an average of 26 percent.

Both RAND and Aberdeen studies identified three similar strategies for improving the supply functions: 1) track the performance of a broader portion of the supply base, 2)

standardize supplier performance measurement across the entire enterprise, and 3) collaborate with suppliers on defining performance metrics.

These researchers found best practices across private firms and DoD which demonstrate a certain pattern for success for improving management systems, organizational structure and processes. We combined the RAND and Aberdeen studies to create the following six best practices. We saw evidence of all six in our research.

1. Assign responsibilities clearly throughout the firm: Blanket statements about policy changes that imply that *PBL is everyone's responsibility*, usually find that anything that is everyone's responsibility is no one's responsibility; it easily falls through the cracks.

The Navy, AF, and DLA all address this issue. Each requires that specific organizations have responsibility for the success of any PBL program. For the Navy, NAVICP is taking the lead. They are the champions of PBL and have a consistent approach to PBL. Responsibility is assigned to specific departments to execute a PBL strategy.

For example, the NAVICP Operations Research (OR) Group is focusing its efforts on understanding metrics. This is a critical task since it carries the responsibility to provide guidance to managers. Each member has a complete understanding of the PBL approach and provides expertise on metrics. Metrics must be right.

2. Design metrics to motivate the right behavior: The cliché "successful firms manage what can be measured" can be overstated, but RAND found that proactive firms *do* rely on metrics as the foundation for managing improvement.[16] Accordingly, metrics designed to motivate the right behavior must be carefully crafted and applicable across the organization. Metrics must 1) induce the decision maker to pursue [organizational] goals, 2) be compatible with the constraints that the decision maker faces in each setting, 3) be easy to collect and verify, and (4) be mutually understood and accepted by the decision maker and oversight authority.[17]

Defining the right metrics is difficult. NAVICP is using its OR group to answer questions about performance. Contractors noted that metrics present challenges for them as well. Initially, it is easy for contractors to exceed expectations and improve performance. After the initial changes take place, it becomes increasingly difficult to continue to gain higher levels of performance. Contractors and government employees hinted at potential difficulties in this area on the horizon.

One Navy contractor talked about how negotiations for more difficult metrics are on-going while performance is still within acceptable performance expectations. If the Navy were to change the delivery expectations to include overseas delivery, the contractor would also have to re-think the metric and the associated cost of meeting the new metric (overseas delivery). The on-going question at NAVICP is whether it is buying too high a level of performance. (The selection of a standard short delivery time of 24-hours or 3-days, when 10-days or 30-days is what is really needed.)

An issue that was not mentioned is the design of forward-looking metrics. Most metrics deal with performance that has occurred, delivery times, backorders, readiness rates, etc. Neither AF nor Navy mentioned metrics that predict outcomes; however a September, 2003, news release identified a B100 engine team from Tinker AFB,

> "That took a process that gave the warfighter adequate support and transformed it into the most outstanding support seen in a decade. They knew they needed to take drastic steps to improve the real root of the problem—forecasting ability."
>
> "They included engineers, maintainers, warfighters, contractors and the logistics specialists responsible for ordering the parts from both the center and the Defense Logistics Agency. Using a COTS application, they started with a 12-month look at each part needed to overhaul a module or engine. The system prioritized action items and provided the budget justification for the buy and repair contracts. They also reviewed current data which is the past usage, and matched it with input from the mechanics who are handling the parts every day, to identify potential parts shortages created by increased wear because of the extended life."
>
> Another issue that lacked attention was how each entity changed its incentive structure to accommodate long-term relationships. While there was an abundance of discussion on incentives in contracts, there was little emphasis on how this provides the appropriate incentives for a long-term commitment.

Metrics and incentives should be designed simultaneously. This will ensure that performance is measured correctly and rewarded appropriately.

3. Manage failures to limit disincentives for risk-taking: Failure is part of the learning process. The term "failing forward," that is, "creating forward momentum with the learning derived from failures," usefully describes this process. [18] While most commercial firms understand this, RAND found little insight about how, specifically, to implement such understanding in DoD.

PBL requires interdisciplinary organizations and teams, consisting of professionals with advanced interpersonal, analytic, and computer skills. PBL requires knowledge of contracting, logistics, funds management, metrics, and organizational effectiveness and efficiency. It also requires building relationships and operating from a holistic view of the organization.

4. Develop a supportive organizational context for tools: These tools include "middleware" to standardize decision-making based on legacy system output and tracking systems to document performance improvements and lessons learned across the organization. The WR-ALC uses *SCCOP* to provide a common operational view of

the total supply chain and details on all factors that affect weapon system availability. Each data element is obtained from the identified authoritative source for the information. This is accomplished through the retrieval, display, and integration of information captured from multiple data sources. (See Appendix I for more information.)

5. Manage relationships with stakeholders: Continuing communication with stakeholders in normal time is one way to get their support when it is needed. In the case of environmental management, Procter & Gamble invested time to train state regulator personnel on issues relevant to the industry. The DoD IG is a similar regulator that may be having some difficulty understanding PBL required changes in contract management and administration.

The DLA Customer Relationship Management (CRM) Office provides a consolidated approach to developing and delivering information related to DLA business goals to key stakeholders and DLA customers. Using an IPT network of customer-touch points, strategic level information at headquarters (from public affairs offices and current DLA publications staff) is integrated with what is happening at the field level. The CRM office then develops content and tools to provide the needed message to customers. (See Appendix II for DLA Best Practices.)

6. Benchmark to promote continuous improvement: With benchmarking, solutions that were never dreamed of are possible. Benchmarking also offers standards, or best practices, as a way to judge performance.

The six best practices are derived from a variety of lessons learned. AMCOM can use these lessons to begin the process of aligning the current organization with the customer's needs. It will be critical for AMCOM to provide the right services, in the right format (a good example is the Boeing Customer Contact Profile in Appendix I), at the right time for the customer.

AMCOM will need to continuously evaluate itself in order to be proactive in relationships with its customer, through techniques like benchmarking and satisfaction surveys. Relationships involve mutual goals, beliefs, understandings, values, trust and commitment. This is true for relationships with employees as well as suppliers and customers. AMCOM must be willing to nurture and develop these relationships.

Financial Management

WHAT ARE "WORKING CAPITAL" FUNDS?

The concept of working capital management originated with the old Yankee peddler, who would load up his wagon with goods and then go off on his route to peddle his wares. The merchandise was called "working capital" because it was what he actually sold, or "turned over," to produce his profits. The wagon and horse were his fixed assets. He generally owned the horse and wagon, so they were financed with "equity" capital, but he borrowed the funds to buy the merchandise. These borrowings were called *working capital loans*, and they had to be repaid after each trip to demonstrate to the bank that the credit was sound. If the peddler was able to repay the loan, then the bank would make another loan, and banks that followed this procedure were said to be employing "sound banking practices."[19]

For the private sector, working capital consists of: cash, inventory, and accounts receivable (what customers owe the company). All are necessary to conduct business, but the hard question is: *In what quantities?* The greater the inventory, the smaller the danger of running out, results in less operating risk; but if inventories are too large, they earn zero dollars, or in reality, a negative return due to storage and obsolescence costs. Therefore, there is an extreme pressure to hold the working capital carried to the *minimum consistent while running the business without interruption.*

DEFENSE WORKING CAPITAL FUND (DWCF)

The DWCF is a revolving fund, or account, in which all income is derived from its operations and is available without fiscal year limitations. It provides financial accountability within a business-like atmosphere with customer-provider relationships between government entities and commercial vendors. It creates incentives by identifying the total cost of providing goods/services, minimizing costs, and measuring performance. Under WCF a provider does not perform work without a funded order or anticipated sale, nor can they exceed capital costs or run out of cash.

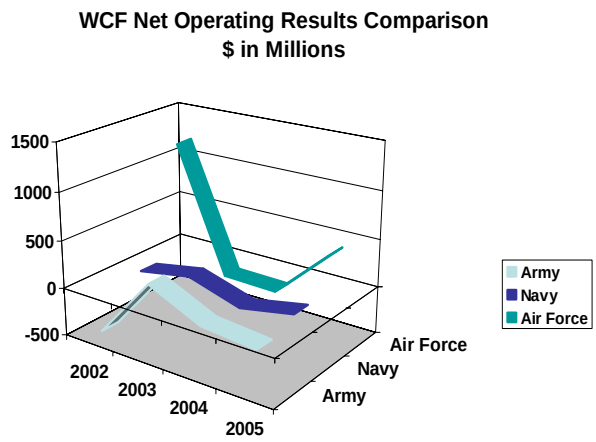
The DWCF is established under Title 10 USC, Section 2208, and funds activities (depot maintenance, supply, R&D, ordnances, DFAS, transportation, base support, information services, etc.); each financed primarily with O&M funds. There are two types of revolving funds: the stock funds for supplies, fuel, food, etc., and the industrial funds for maintenance, overhaul, repair, and modification of weapon systems and components, as well as other functions such as research and development (R&D).

DWCF Management

The management of the DWCF falls under the Anti Deficiency Act. Examples of ADA violations include: obligations for capital purchases exceeding the limitation on the operating budget, cash outlays in excess of the fund, and obligations exceeding available budgetary resources. The DWCF is managed by a policy board of Defense

and OMB financial representatives. It maintains a central policy approach, with decentralized execution. Components manage their own business areas. Each business area is managed and operated as an independent entity, but cash is corporately held by each Fund and OSD.

The purpose of the DWCF is to improve cost awareness, promote cost consciousness, mirror private sector operations, identify full cost, keep decision makers aware of the cost of their decision, create buyer-seller relationships, etc. As such, the WCF does not save or lose money, but focuses on cost and cash management. The primary way DWCF working capital funds differ from the commercial version is one of incentives. While "profit" is the incentive in the private sector, "breaking even" is the motivating force in DWCF. Each working capital fund activity has the goal of achieving a Net Operating Result (NOR) of zero in a given fiscal year, which means the activity generates sufficient revenues to match the cost incurred. If profits (losses) occur during the year, the unit responsible for pricing, such as NAVSUP, lowers (raises) price to compensate in the next fiscal year.



For 2002, the AWCF is the only one with a negative NOR. The AWCF also appears to be the only one needing supplemental appropriations from Congress. In 1997, prior to Gen Babbitt's cost management activities the AF had significant financial losses. They have a very high positive NOR for 2002 and are now explaining how it happened to Congress.

FIGURE 5: WCF NET OPERATING RESULTS

Funds provided to a working capital fund activity span fiscal years and remain available in order to pay for the goods or services being provided by the activity. In contrast, appropriations are earmarked for specific purposes and have a finite period of time in which they must be used. Working capital fund activities recover all costs through the stabilized billing rates charged to customers. These include direct costs, indirect costs, general and administrative (G&A) costs (overhead), and any prior year gains or losses.

DWCF RATE SETTING CATEGORIES

The customer rates are established for products/services furnished by a provider on a unit cost or activity based costing processes. Rates are based on full costs (direct, indirect, G&A, gains and losses from prior years, and depreciation). Depreciation is

straight line basis with ADP equipment and COTS software at 5 years; internally developed software and equipment at 10 years, and facilities at 20 years.

- For supply, rates include cost of the goods plus a surcharge that recovers the actual costs of operating the supply business.

- Distribution Depot rates include cost of receipt, storage, packing, and shipping for goods ordered by customers, expressed as cost per line item received, stored, or shipped.

- Depot Maintenance rates include cost incurred in repair, rework, or modification of depot level reparable items or components, expressed as cost per direct labor hour.

In the following table is the annual percentage of change and the hourly depot rates for the three services from 2002 to 2005. FY 2002 is actual, the rest are projections.

WCF CUSTOMER RATE CHANGE (PERCENTAGE)				
Supply	**2002**	**2003**	**2004**	**2005**
Army	-2.5	9.2	4.5	1.5
Air Force	3.7	4.6	7.2	3.8
Navy	7.6	8.8	1.3	4.0
Depot Maintenance	**2002**	**2003**	**2004**	**2005**
Army	4.0	7.4	8.3	2.0
Air Force	16.9	26.6	19.1	9.4
Navy	2.3	5.4	0.5	2.7
Depot Maintenance Hourly Rates				
Army	124.57	133.80	144.91	147.85
Air Force	157.73	199.66	237.84	260.16
Navy	151.61	160.58	162.44	165.30

TABLE 4: WCF CUSTOMER RATE CHANGE & DEPOT MAINTENANCE HOURLY RATES

Supply Management Business Areas

Individual item prices are established by including the cost recovery elements, by percentage or fixed amount, with the commodity acquisition cost of the item. The commodity cost (or acquisition cost) is the most current cost of a representative procurement. The cost recovery factor is developed based on operating costs plus prior year gains/losses; shipping and transportation (inventory issues, customer returned items with/without credit, depot level reparable (DLP) exchange carcasses, lateral redistribution), inventory expenses, inventory maintenance, economic adjustments for inflation, and repair cost including attrition (washouts and losses). Supply operations includes civilian labor, military personnel at supply activities, a portion of the Headquarters costs related to inventory management, the receipt and issue of material, and the depreciation of capital assets.

The supply management entities for the AWCF are shown in the following table.

AWCF – SUPPLY MANAGEMENT ENTITIES	
U.S. Army Tank-Automotive and Armaments Command, Rock Island, Il	Non Army Managed Items (NAMI) – Central Business Unit
DLA and General Services Administration (GSA) Items:	Includes repair parts, industrial supplies, general supplies, and ground support supplies
U. S. Army Aviation and Missile Command, (AMCOM) Huntsville, AL	Aircraft and ground support items, missile systems items
U. S. Army Communications-Electronics Command, Fort Monmouth, NJ	Communication and electronics items
U.S. Army Tank-Automotive and Armaments Command, Warren, MI (TACOM-W)	Combat, automotive, and construction items
U.S. Army Tank-Automotive and Armaments Command, (TACOM-RI) Rock Island, Il	Weapons, special weapons, and fire control systems
U.S. Army Soldier and Biological Chemical Command, Aberdeen Proving Ground, MDSBCCOM	Ground support items, and chemical weapons
HQ, U.S. Army Materiel Command (AMC), Alexandria, VA	Propositioned War Reserves: DLA/GSA items: repair parts, clothing, subsistence, medical supplies, industrial supplies, ground forces supplies

TABLE 5: AWCF SUPPLY MANAGEMENT ARMY ACTIVITY GROUP MAJOR SUBORDINATE COMMANDS

Each Air Force Logistics Center (ALC) functions as an inventory control point (ICP) for specific type items (electronics, engines, command and control, etc). Each center has its "niche" and these responsibilities are neither redundant nor competitive. As the Logistics Centers perform maintenance, they buy from each other's ICPs.

Non-Supply Management Business Areas

Include depot maintenance, research and development, distribution depots, etc. and use unit cost rates based on identified input/output measures. These measures establish fully cost burdened rates, such as cost per direct labor hour, cost per product, cost per item received, cost per item shipped, stored, etc. Rates are based on full costs, which include: direct, indirect, general and administrative costs, gains and losses of prior years, and depreciation.

Cost is the language that every one understands. To be competitive an organization must know **true cost** prior to determining what they will charge to provide a service. In a service organization the biggest expense is labor. How an organization is structured and how efficiently the workers produce a service determines profit. *(See charts comparing WCF revenue and expense per employee.)* Typically, processes use resources (people, technology, etc.) from several functional areas, or cost centers.

The Aviation TechLoop process is an example of the complexity of procurement of items for weapons systems. The Technical Loop can include over 50 check points prior to forwarding a procurement work directive (PWD) to the Acquisition Center. Depending on the item, check points may do a cursory review or an in-depth review and approval process. To determine the true cost of procurement, the fully loaded labor cost for each person who reviews the procurement action must be included, in addition to the labor cost of employees in the acquisition center.

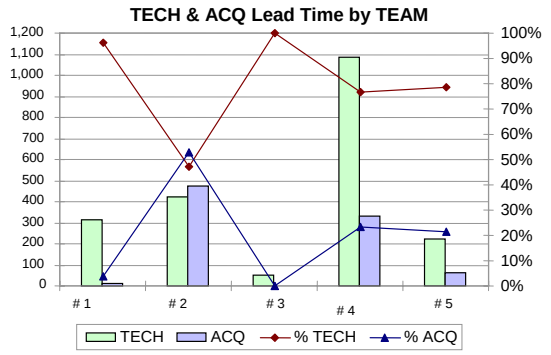


FIGURE 6: AVIATION TECHLOOP EXAMPLE

For each PBL initiative, NAVICP conducts a Business Case Analysis (BCA). The BCA is designed to quantify any cost benefits the Navy will realize through the initiation of a PBL contract. The BCA process involves determining the Navy's current cost of doing business. This "without PBL" cost is compared to the cost to the Navy with a PBL arrangement. The "with PBL" cost includes both the PBL supplier's costs as well as residual cost the Navy will retain even under a PBL arrangement. These cost benefits may take the form of cost saving or cost avoidance. The savings goal is to break even or better in both the NWCF and in total cost to the Navy. Some cost areas considered in the BCA are:

Fleet maintenance labor	Spare parts procurement	Warehousing
Transportation	Sustaining engineering	Fleet consumables
Other government labor	Other supply system costs	Depot repair

The Navy has two inventory control points – Aviation and Sea. Both are aggressively into PBL. The NAVICP buys *performance* (Honeywell on the APU) and sells *parts*. They must then translate performance into parts for accounting purposes. As the NAVICP develops the BCA they include a cash management plan in order to continue to have money to pay the NAVICP overhead. If all of the WCF dollars are obligated to contracts, they will have no cash to pay themselves. When a contract is in place, all of the cash must be paid on the first day of the FY versus the traditional method of paying for each transaction over the entire fiscal year.

Comparisons of WCF Activity Groups

ARMY, AIR FORCE, & NAVY ACTIVITY GROUPS [20]		
Army Activity Groups	**Air Force Activity Groups**	**Navy Activity Groups**
Supply Management buys and maintains assigned stocks of materiel for sale to customers, primarily Army operating units. The Single Stock Fund (SSF) provides total asset visibility, down to and including the Division Authorized Stockage Level. The implementation of the SSF and the Logistics Modernization Program (LMP) will provide real time management of the inventory and greater flexibility to optimize assets for AMC MSCs.	**Supply Management** activities procure and manage inventories of consumable and reparable spare parts required to keep all elements of the force structure mission ready. New flat-rate surcharge to reduce the item price volatility from year-to-year. Focus on filling backorders and improving performance factors, aggressively pursue reducing impact of growing parts obsolescence, 19% of electronic warfare components have no qualified manufacturing or repair source.	**Supply Management** provides inventory management functions for shipboard and aviation repairable and consumable items, management of overseas Fleet Industrial Supply Centers and miscellaneous support functions for ashore and Fleet commanders. NWCF funds such initiatives as Serial Number Tracking and Enterprise Resource Planning (ERP) to be used to reengineer and standardize business processes, integrate operations, and optimize management of resources while controlling cost and improving readiness.
Depot Maintenance provides organic industrial capability to repair, overhaul, and upgrade weapons systems equipment; compete and partner with private industry to deliver goods and services from five major depots: Anniston, Corpus Christi, Letterkenny, Red River, and Tobyhanna, all managed by AMC.	**Depot Maintenance** provides the equipment, skills, and repair services necessary to keep forces operating worldwide. Higher material cost driven by costs of engine parts and higher consumption. Double digit sales rate growth associated with increasing age of aircraft fleet.	**Depot Maintenance** includes three active shipyards which perform functions such as logistics support for assigned ships and service craft, three active aviation depots to repair aircraft, engines and components, and two Marine Corps depots which inspect, repair, rebuild all types of ground combat and combat support equipment. Converting Puget Sound to mission funding for 2-year pilot in FY 2004.
Ordnance provides organic capability to produce quality munitions and large caliber weapons, ammunition maintenance and renovation, manufacture, storage and demilitarization. There are three arsenals, two ammunition plants, five ammunition storage depots, and three munitions centers managed by AMC MSCs.	**Transportation** provides the worldwide mobility element of the global engagement vision through a partnership of military and commercial assets. Over 80% of cost base is in support of contracts and materials, productivity initiatives resulted in savings of over $1.3B. AF has cash management responsibility but does not have day-to-day management responsibility for transportation operations.	**Transportation** Military Sealift Command operates service-unique vessels, primarily civilian manned, to provide material support to the Fleet, Special Mission Ships which provide unique seagoing platforms and Afloat Propositioning Force ships which deploy advance material for strategic lifts; managed from five area and three sub-area commands around world.
Information Services provides for development and sustainment of automated information and communications system; commercial sources for purchase of small/medium computers, hardware and software and support services. Operates on a cost reimbursable basis and will decapitalize at end of FY03.	**Information Services** activities make it possible to operate and improve data collection and management systems essential to war fighting and support activities. *The use of the Software Engineering Institute/Capability Maturity Model* certification helps insure the level of competence is comparable to private industry. Uses over hires to access direct labor personnel to accomplish user requested programs; will allow for lower rates. Adding IDE personnel and personnel related to contracting systems in FY 04.	**Research & Development** consists of the Naval Research Laboratory, the Naval Air Warfare Center, the Naval Surface Warfare Center, the Naval Undersea Warfare Center, and the Space and Naval Warfare Systems Centers to provide a wide range of R&D, test, evaluation, and engineering support functions. **Base Support** consists of nine Public Works Centers and the Naval Facilities Engineering Service Center providing utilities services, facilities maintenance, transportation support, engineering services, and shore facilities planning support.

TABLE 6: ARMY, AIR FORCE, & NAVY ACTIVITY GROUPS

WORKING CAPITAL FUND OPERATION

The WCF operates, in theory, as follows:

1. Congress provides a one-time cash deposit.

2. Customer (warfighter) receives annual appropriations.

3. Customer sends work orders or project orders to the WCF provider.

4. Provider furnishes the service or product, pays for expenses incurred, and bills the customer.

5. Customer pays the bill.

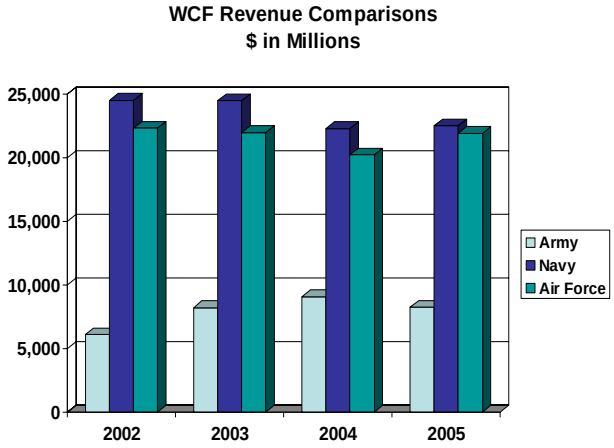
6. Provider operating losses/gains (in the current year) increase/decrease customer rates in the following year.

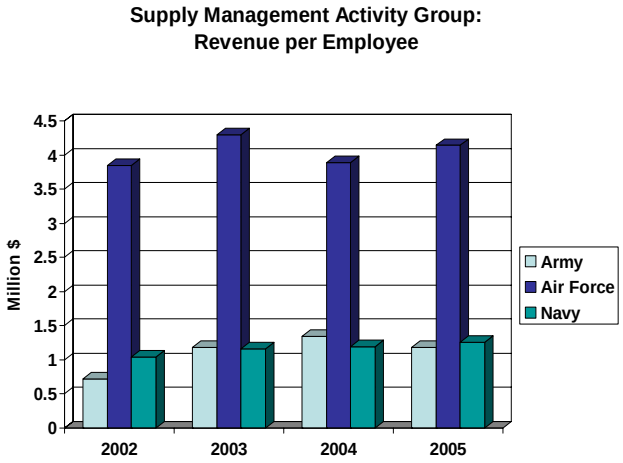
An example of combining types of money is the Joint Surveillance and Target Attack Radar System (JSTARS). The platform is a Boeing 707 commercial plane. The standard items are in the WCF. However, inside the Boeing 707 are newly developed items – with PBL support agreements outside the WCF. With JSTARS, the prime contractor (Northrop Grumman Corporation) is a Product Support Integrator (PSI) or sole-source contractor for Total Systems Support Responsibility (TSSR) and has dual responsibility to manage buying items from the government (WCF provider) and for buying unique items from commercial sources.

The AF holds the PSI responsible for supply and maintenance, whether the parts and services are organic or commercial. Consequently, the PSI has some flexibility. For example, if the PSI orders a part from the government, with an expected delivery time of 10 days, and the government provider cannot meet the delivery date, the contractor is allowed to go to another source of supply. This element of competition exists to keep the government provider customer focused. Contract clauses are also in place to protect the contractor in case there is a defect or problem with the government provided parts or services.[21] There are also "off ramps" to protect the interest of the government. If the contractor does not deliver satisfactory services, provisions are written into the contract to allow the government an exit strategy. (See Appendix II for a JSTARS summary.)

The charts below compare the dollar amounts of WCFs. Budget tables for the actual amounts in the Fiscal Year (FY) 2004/FY 2005 Biennial Budget Estimates are in Appendix V.

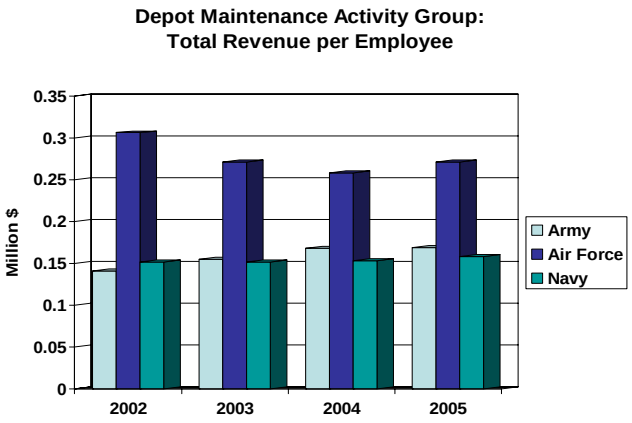
The Working Capital Funds (WCF) operate under the same rules across DoD. A perception exists across services that the operation of the funds varies from service to service. After comparing the funds, the most significant difference is the amount of revenue in each fund. As indicated in this chart, the Navy and Air Force funds are almost five times as large as the Army fund. This may explain why the Army is concerned about the impact of funding large PBL contracts.

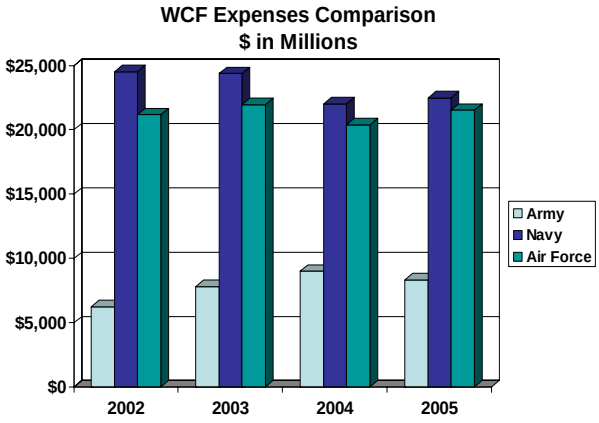




One method of measuring the productivity of an organization is to compare "activity" measures. The amount of revenue generated for each employee of the organization is an example. From this chart, we can see that, based on the total number of civilian and military employees with WCF salaries, the revenue generated per employee is considerably higher for the Air Force Supply Management Activity Group than for the other two services' supply management groups.

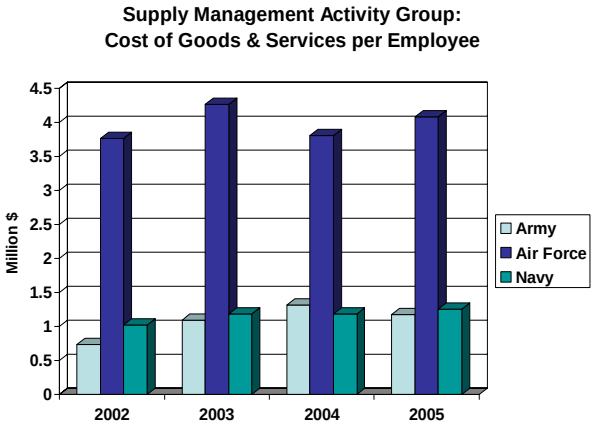
The revenue per employee for the Depot Maintenance Activity Group is approximately twice as high for the Air Force as it is for the other two services. Multiple variables exist that could affect an activity rate. The number of employee supporting Air Force may not be as large as the other services due to the number of contractors supporting the weapon systems. An increase in the number of employees would result in less revenue per employee.

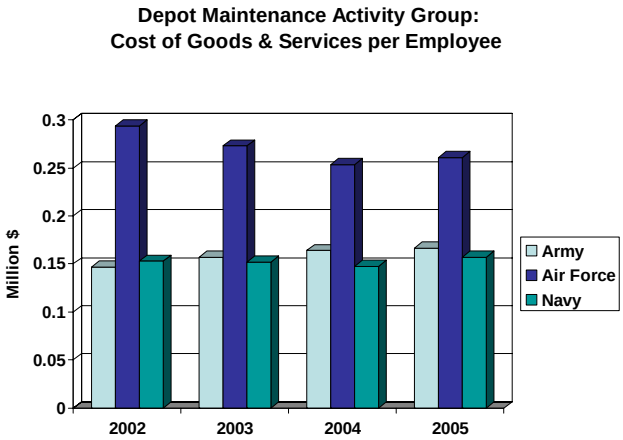




The comparison of overall expense across the AWCF, the NWCF and the AFWCF is similar to the comparison of total revenue per fund. Expenses are necessary to generate revenue and should match revenue since the net operating results of the DWCF is zero. Once again, just the difference in amounts between these funds explains why the impacts of certain policies are so significant.

The Depot Maintenance Activity Group is the largest customer of the Supply Management Activity Group. The utilization rate of supplies and other goods per employee may be considered an indicator of how much inventory is purchased, distributed, and managed by each supply employee funded by DWCFs. Once again, the AF use of contracts for total system support may be inflating the cost per employee.





Cost of Goods and Services per Employee is another activity ratio. As an employee accomplishes depot repairs they must use parts and other services to accomplish maintenance. Cost per employee is a measure of the activity, not how cost effective the available parts and supplies are, nor how efficient the labor is when using those same parts and supplies.

FIGURE 7: DWCF COMPARISON CHARTS FOR SUPPLY & MAINTENANCE SERVICES

The WCF is viewed in terms of supply and maintenance, not platforms or systems. One proposal is to establish WCFs that are program unique. Then, if the WCF wishes to issue a PBL to buy performance from vendors, the separate fund would be used for the total life cycle cost of the program (e.g., Cargo WCF, Apache WCF, etc.). The creation of such a WCF would raise the question of how to apply the overhead from the MSCs (AMCOM, TACOM, etc.) to multi-systems.

The NWCF and the AFWCF activities are heavily involved in strategic sourcing initiatives and expect to continue to produce savings through actions such as A-76 competitions and functionality reviews. No mention is made of AWCF savings from these same competitions and reviews.

The Army has eliminated the wholesale/retail concept from the AWCF. It is now a 'single stock fund' and in the future should show savings from the elimination of duplicate bookkeeping.

By law, the WCFs are required to include performance indicators. Figure 7 shows additional comparisons of the WCFs. Additional tables are in Appendix V. These charts compare the budgets for the Army, Navy and AF WCFs.

Working capital funds present unique challenges. The other services have embraced the WCFs and have found opportunities to exploit the positives. AMCOM will need to work with the Army's financial managers to develop a similar situation. This area requires in-depth knowledge and understanding. It is also the most misunderstood concept that we explored with our interviewees. There is an abundance of information and we have tried to provide a concise financial management summary.

Contracting and Performance Agreement Management

Private sector companies like Caterpillar and Dell use contracts and partnerships to create a virtual organization. Dell draws upon more than 150 vendors, 30,000 field technicians worldwide, and 3,600 technical support personnel. Dell's global reverse logistics network involves a complex exchange of millions of spare parts between supply chain participants, utilizing business processes and a 'World Chain' automation system. Caterpillar (CAT) uses a contract management system, supported by a CAT inventory control system, to monitor supplier performance for its Total Logistics Services contract with the Navy. Mission Readiness 'pre-CAT' was at 12%, it is now at 91%.

In the PBL environment *relationships*, not terms and conditions make contracts work effectively. All of the program managers we interviewed wanted to discuss the relationship aspects of their contract arrangements. Several of our interviews suggested that the contract document was not a major concern. They are viewed as a formal expression of the terms of the relationship rather than day-to-day practicing guidelines.

One Navy contractor indicated that the contract was irrelevant. An Army government official noted the same thing. One industry executive commented that the logistics partners know what it takes to fulfill the contract and to keep the job. A logistic manager, however, stated that the strength of the contract will come into play, if or when the relationship is broken and the conditions must be enforced. It is when the relationship doesn't work that the terms and conditions matter.

There was little discussion on how the mechanisms for contracting have changed except for the use of 'alpha' contracting. This is where government and contractor representatives review/analyze/agree on the elements of the proposal as they are developed. These meetings take place after an Industry Day is held. The objective is to avoid the typical sequential time-consuming process and to verify an understanding of the requirements.

The Figure below describes the range of options available to the government, from the traditional organic support to the total system support, and gives examples of each.

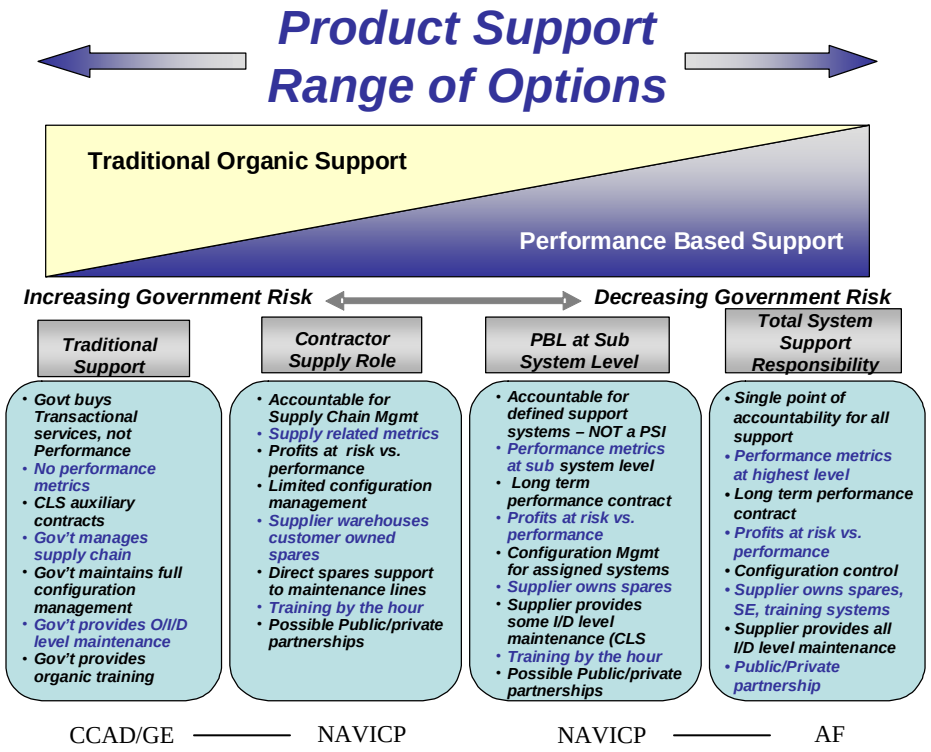


FIGURE 8: PRODUCT SUPPORT RANGE OF OPTIONS

Between the first two (Traditional Support and the Contractor Supply Role) the government controls all of the significant decisions and controls the sustainment of the weapon system. A question for the government manager is "How much control do you really have?" If control exists, why do back orders and parts obsolescence exist? The

government's risk is high in traditional support because the government is not only responsible for all aspects of materiel management, but actually doing the work.

As the range of support options move toward one of Total System Support Responsibility the government's project manager and the contractor's program manager move toward an equal share of the risk. It is clear from our interviews that the government is very concerned about risks and works to make sure that an unfair amount of risk is not passed on to the contractor.

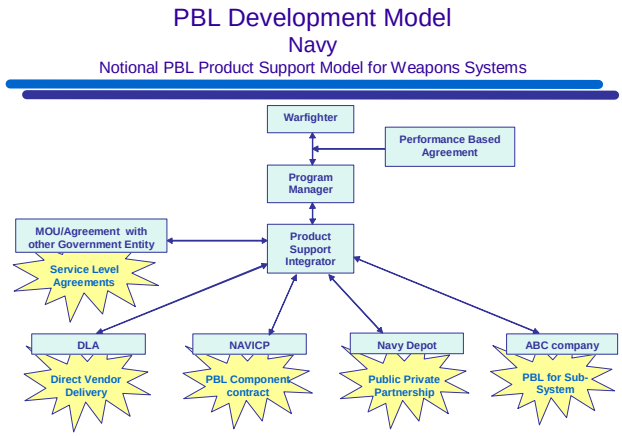


FIGURE 9: NAVY PBL DEVELOPMENT MODEL FOR WEAPONS SYSTEMS [22]

The NAVICP is building its PBL efforts around major subsystems with the Navy as the PSI for system support. One of the initial lessons learned from the product support pilots concluded: "The imposition of a contractor integrated product support strategy on existing weapon systems is exceptionally difficult at the system level. More promising strategies include major subsystem strategies or major upgrades."[23]

The F/A-18E/F Integrated Readiness Support Teaming (FIRST) concept, an alternative support strategy emphasizes Government/Industry partnerships, risk management and shared accountability. The Navy PBL product support model builds support around subsystems and components. The NAVICP elected to move out and lead the transition to PBL; they launched PBL and have transitioned to new ways of providing parts and services.

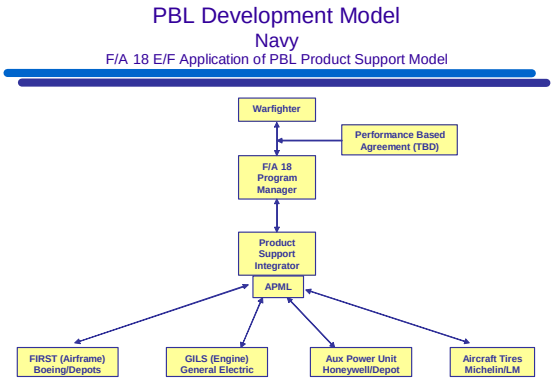


FIGURE 10: NAVY PBL DEVELOPMENT MODEL FOR F/A-18E/F [24]

The Total System Support Responsibility (TSSR) is the Air Force's approach to PBL. Since the AF weapon systems (aircraft) are heavily dependant on the OEM, it is a

natural progression to continue to do business with the OEM after the system is deployed.

PERFORMANCE AGREEMENTS

The Air Force is very satisfied with the performance of its TSSR contractors. The JSTARS is an example of merging together the capabilities of organic depots and the strengths of commercial engineering services firms with the technical knowledge of the OEMs. As shown below, multiple contracts, performance agreements and service level agreements (SLA) integrate the resources of the government and industry under one major partnership agreement.

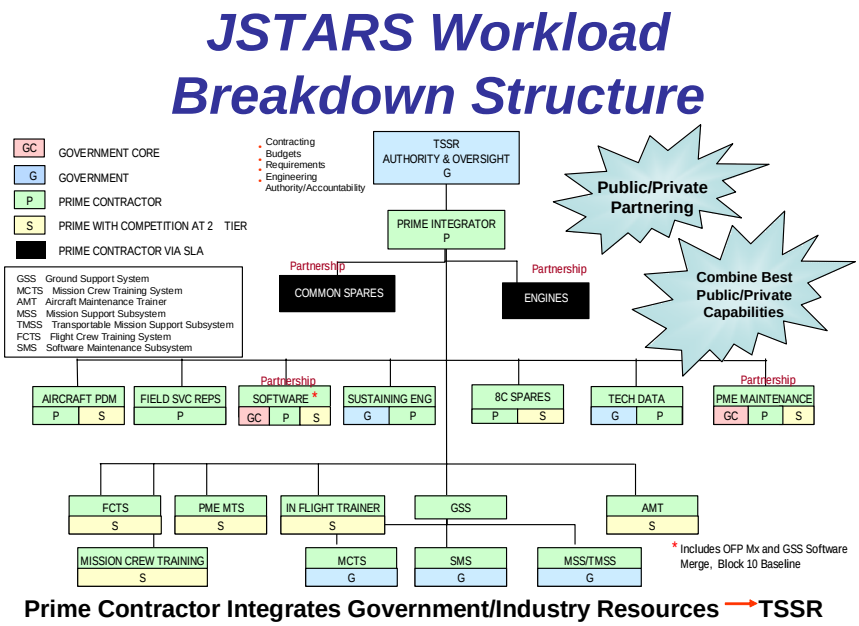


FIGURE 11: JSTARS WORKLOAD BREAKDOWN STRUCTURE [25]

Within the context of these relationships, the details of who performs what tasks are clearly identified. For example, the government designated engines as a core capability and has responsibility. Other functions, like software, may have multiple vendors responsible, depending on where the software application functions.

When one considers the number and types of government managers involved with the support of a weapon system, the need for partnerships and IPTs is clear. The following figure is representative of the complexity of product support needed for a typical Army system. These organizations are only the top-level, underneath are additional organizations and hundreds of commercial vendors who actually deliver the system's components.

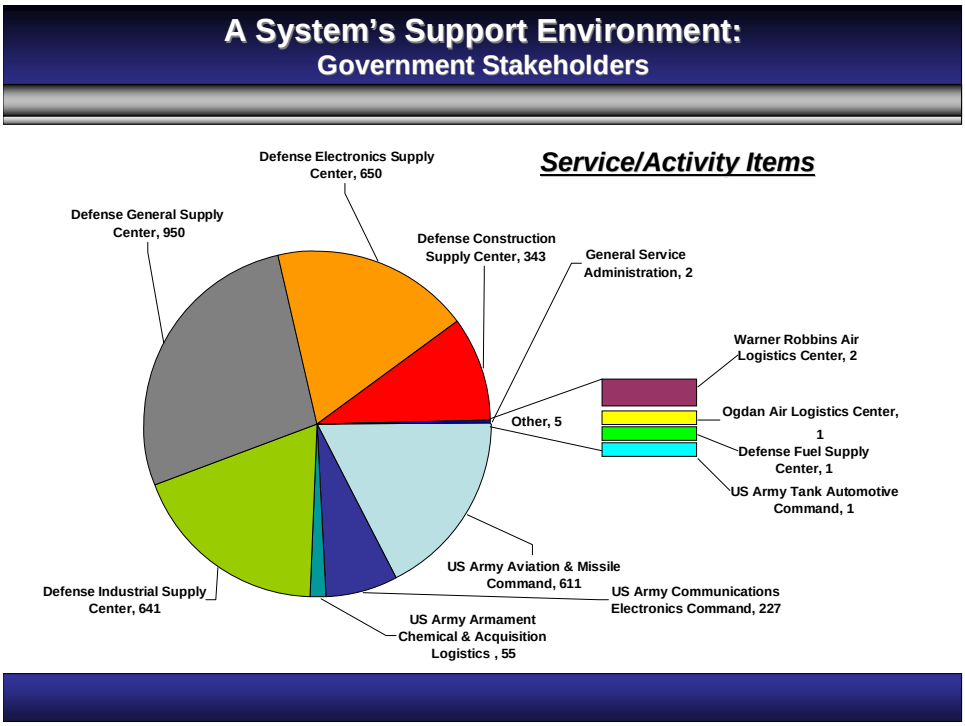


FIGURE 12: SYSTEM SUPPORT ENVIRONMENT

This particular system support environment totals almost 3,500 components. The number increases exponentially when supplier and vendors are added. The magnitude of the support environment is a clear indicator of the complexity of the partnership environment. The development of partnerships and service level agreements requires a balance of power and incentives to make it all work. When it happens, the combined energies are enormous, creating a synergy that pushes accomplishments to level previously unthinkable.

The scope of work to be supported with an agreement or partnership can range from a simple DoD facility lease to full system support. Fourteen characteristics for successful partnerships and the benefits to be gained are given below.

SUCCESSFUL PARTNERSHIPS	
Success characteristic	**Reason for/Benefit of partnership**
Long-term relationship and commitment	A long-term relationship and commitment (1) permits both contractors and depots to better plan future workload requirements and create a better business case for the contractor to make investments to improve depot repair capability and (2) allows the contractor to help manage parts obsolescence.
Shared partnership vision and objectives	Having partners share the same partnership vision and objectives helps ensure that the partners will not be working at cross-purposes.
The right metrics and incentives	The right metrics and incentives are needed to effectively measure that progress is being made and ensure that the partners are effectively motivated to achieve partnership goals and objectives.
Early acquisition community involvement	Developing the partnership with acquisition community involvement during the early phases of a weapon system's acquisition helps to ensure that any additional depot maintenance capability development needed is fully planned and funded.

SUCCESSFUL PARTNERSHIPS	
Success characteristic	**Reason for/Benefit of partnership**
Complementary skills and abilities	Each partner should bring complementary skills and abilities to the partnership because if each partner's capabilities are the same, the relationship may result in a competitive and potentially adversarial relationship, not the cooperative synergistic relationship hoped for in a partnership.
Senior-level advocacy and support	DoD and contractor senior management support for a partnership is necessary to ensure that the effort receives the focus and resources needed to achieve success.
Sound business case analysis	A comprehensive business case analysis, including expected outcomes, should be conducted as part of the decision process for entering a partnership to ensure a sound result benefiting both the depot and the private-sector partners.
Mutual trust and shared risk	The partnership should be firmly grounded in mutual trust, open communications, and balanced risk among partners.
Flexibility to change partnership scope	To ensure the ability to adapt to changing circumstances or factors, the partnerships should have the flexibility to change the partnership scope.
Balanced workload	Workload should be balanced among the partners to ensure meaningful involvement for each partner and ensure that one partner does not receive only low-skilled work or no work at all.
Independent review and oversight	Independent review and oversight provides an objective assessment of whether each partnership is achieving the expected benefits and that each partner performs as expected. Such a review also provides a basis for correcting or redirecting partnership efforts if expectations are not being met.
Enforce partnership decisions and requirements	To ensure successful partnering efforts, the partners' senior management must provide a mechanism for enforcing compliance with partnership decisions and requirements.
Full coordination with all stakeholders	Public-private partnership efforts should include steps to get feedback from all stakeholders on planned efforts and adjust the partnering strategies to reflect legitimate concerns of these stakeholders.
Clearly documented objectives in partnering agreement	Once clear mutual partnering objectives are determined, they should be documented into a formal partnering agreement. The documentation can provide for dispute mediation and resolution, and also help delineate each partner's liability.

TABLE 7: SUCCESSFUL PARTNERSHIPS

NEW UNDERSTANDING

With PBL, traditional functions of the government are shifted to the contractor without giving up the "core" capabilities, allowing the government to maintain the capability but relinquishing the performance of the service to the contractor. For example, an Item Manager (IM) is concerned with individual parts and the supply of specific items. With a PBL arrangement the item manager is now a manager of suppliers not parts. Where, who, how many, etc. are now the work of the contractor.

In this new role, the IM is responsible for pricing to recover costs, helping with development of the bill of materials (BOM), scheduling repairs and forecasting (with the contractor) the out year requirements. The contractor will handle ordering and inventory accountability of parts along with the flow of materials etc., to ensure the work line is not interrupted. The new IM must provide input to the evaluation of the contractor's performance, determining payment and award fee, if applicable.

This changing role of the IM indicates changes are required in the decision making

process. Ultimately, the question is how much responsibility should be given to the contractor.

DECISION FRAMEWORK

A study by Lawther [26] (2002) presents two dimensions to consider when deciding how much control to retain: uncertainty and complexity. These dimensions are dependent; as complexity increases, uncertainty increases. The reverse is also true, with less complexity there is less uncertainty.

The technical expertise required to do the work determines complexity. A continuous review of the extent to which the contractor has the knowledge, training, and education needed to do the work should be part of the contracting process.

In the following examples, we use the term Logistics Manager (LM) for the government's representative. In most cases this role is actually an integrated product team (IPT) or integrated product support team (IPST). One of the fundamental changes in the DoD acquisition culture requires that individuals and organization change from a hierarchical decision-making process to one where decisions are made across organizational structures by multidisciplinary teams. The teams are formed when the first consideration is given to outsourcing. The IPT includes representatives of all stakeholders (government and/or private sector functional experts) and, if it is a joint operation, other services. DLA is often invited to participate.

Based on Lawther, the government is required to maintain a high level of functional knowledge about the means of delivering a service unless the results are clearly visible and easy to measure, or if the service is routine. The more complex the delivery of a service, the more important it is for the LM to have a knowledge of how the work should be performed. How well the LM is able to measure the contractor's performance is the most significant factor in making this determination.

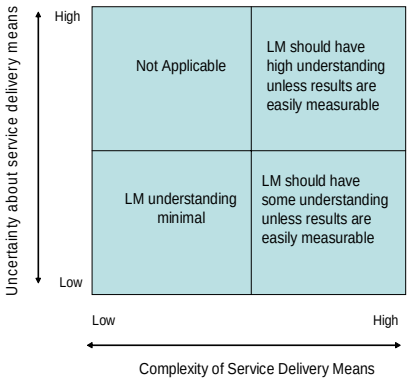


FIGURE 13: KNOWLEDGE OF SERVICE DELIVERY MEANS

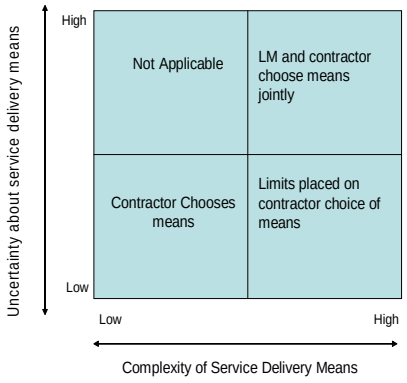


FIGURE 14: DISCRETION TO CHOOSE SERVICE DELIVERY MEANS

Under *low uncertainty and low complexity* the LM needs only a minimal understanding of the contractor's work processes and lets the contractor choose the best methods or 'means' for delivery of the service. As with the GE engine program, GE manages, forecasts, stores, and delivers routine parts on time to the depots. A PBL contract may require a certain number of engines in stock and all other details would be managed by the contractor.

Under *low uncertainty and high complexity* the LM can allow freedom to the contractor, within certain limits. The LM does not need an in-depth knowledge if reasonable assurance of the contractor's expertise exists and if identifiable milestones or delivery dates have been established. An example of this is allowing contractors to make technology changes that are transparent to the user. The use of the OEM is one way to be sure that the expertise exists.

Under *high uncertainty and low complexity* the LM is left to make each decision on its own merits. This is similar to delivering parts to an OCONUS based unit; the uncertainty of proper delivery is compounded by the foreign customs and the conflict.

Under *high uncertainty and high complexity* the LM must have both knowledge of contractor work processes for the delivery of services and joint decision-making responsibility with the contractor. In such cases, the government works closely with the contractor to define, approve, and implement the changes. If valid output/outcome measures are available, and a performance contract is in place, the contractor may be allowed greater discretion. The incentive and/or penalty portion of the contract must be enforced or the service quality level may decline.

Where evolving technology or custom solutions are required, the choice of means must be an ongoing effort between the contractor and government technical and program managers.

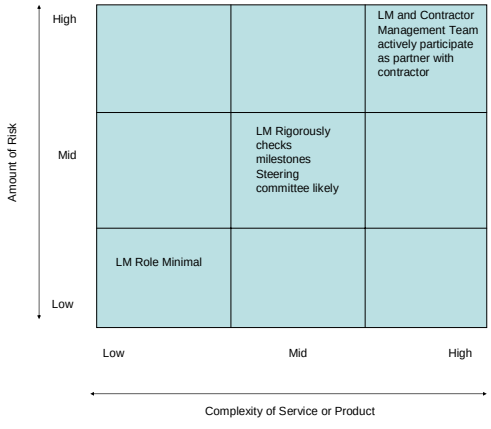


FIGURE 15: INFLUENCE OF RISK ON LM CONTRACTING ACTIVITY

Figure 15 illustrates the dimensions of risk and complexity. Clearly under conditions of low risk and low complexity the LM should play a minimal role. As complexity increases the LM takes on additional responsibilities. The LM provides oversight through the evaluation of milestones and metrics, and may provide strategic guidance through the use of steering committees. When the level of risk and complexity is at its highest, the LM and contractors forge partnerships.

Risk, the likelihood that the service will not be provided, or the product delivered, is always a factor. Risk is dependent upon how important the delivery of the service/product is to accomplishing the organization's goals or mission and how large a negative impact will occur if the goal is not met. It is also depends on the number of available suppliers for the product or service and how easy it is to cancel the present contract and write a new one. Risk is also dependent on the LM's knowledge, skills and ability to find a solution to service delivery problems. [27]

Ultimately the challenge for AMCOM is to find a way to provide the appropriate level of service to the PEO community. Integration of specific system support requirements with the commodity type support currently provided across weapon systems is realistically labeled "The Real Challenge" in Figure 16, from the DAU Road Show.

The integration challenge can be managed at either the system level or the subsystem level. The dimensions of risk, uncertainty and complexity must all be considered before making this determination. If the levels of the three dimensions increase, compounding with each subsystem element, the LM is better off integrating at the system level.

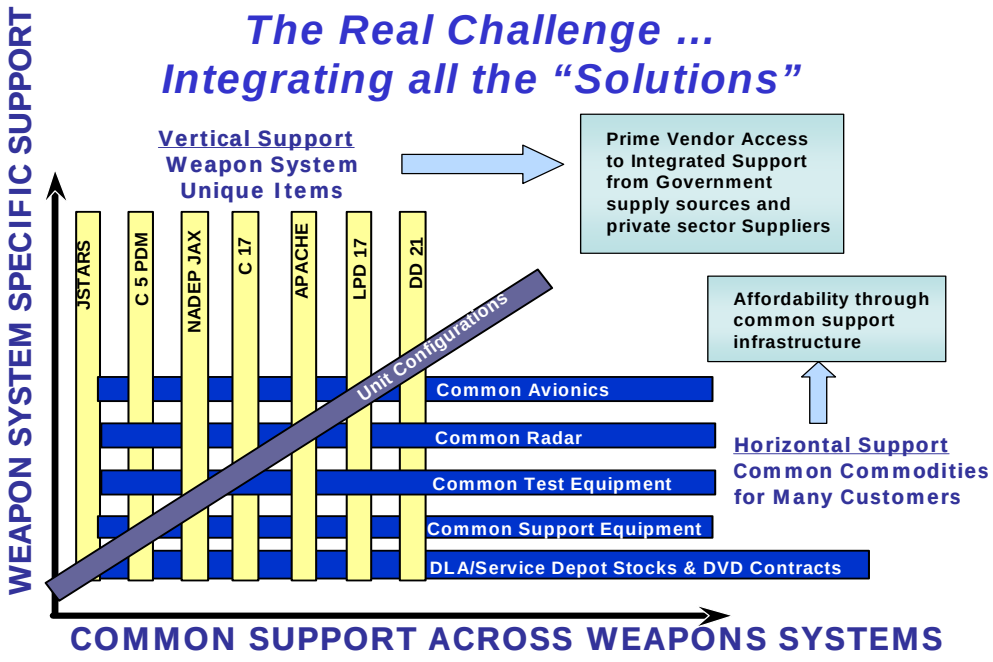


FIGURE 16: INTEGRATION CHALLENGES ACROSS SYSTEMS

As support moves from legacy to future systems the levels of uncertainty, risk and complexity all increase. Issues in Figure 17 are three classes of systems; legacy, current, and future. Future systems are those that are currently under development and the PEO is incorporating improved sustainment technology and practices. (The RAH-66 Comanche is a good example; see Appendix II for additional information.) Since current systems are still in production they offer opportunities to update with block

level upgrades. Legacy systems offer opportunities for incremental improvements. The greatest improvements in customer wait time (CWT) are made as PBL implementation reaches the full TLCSM spectrum.

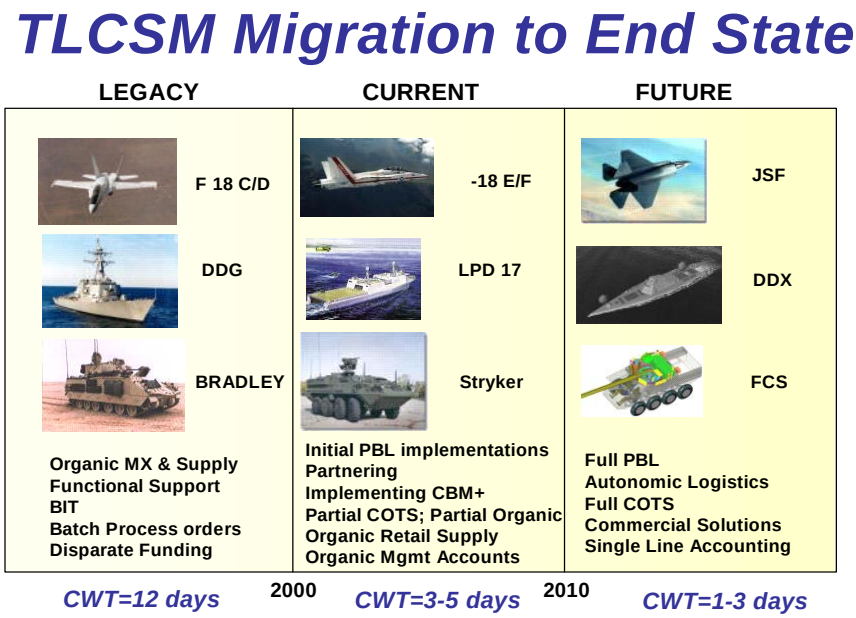


FIGURE 17: TOTAL LIFE CYCLE SYSTEM MANAGEMENT MIGRATION

DEVELOPING INCENTIVES

After selecting the PBL strategy, the next step is to provide the proper incentives to ensure the contractor will be successful. This requires a two-step process for assessing performance.

The first step is to assess the incentive structure of the contract, the financial rewards and the length of time available for contract extensions. Just as a successful coach receives a contract extension and financial rewards for winning a certain number of games, logistic managers and contractors need to build similar mechanisms into contracts to provide incentives for making the services better, faster and cheaper.

The second step is assessing performance metrics. Just as the coach must win at a specified level, so must the contractor perform to a specified level. The type and level of performance the customer needs drives the selection of the right metrics.

The DWCF's activities are required to have performance metrics. A sample list is in the Financial Management Appendix V. The AF computes the Not Mission Capable Supply Rate (NMCSR) for each weapons system, not parts, such as engines. The Navy uses performance metrics based on the contract requirements.

SAMPLE NAVY PERFORMANCE METRICS
1. Fill Rate – A percentage of all requisitions that were transmitted to the contractor that are filled within the specified number of metric days. The number of days must be specified because different contracts have different required 'standard' fill rates.
2. Total Number Open Requisitions (Not in Backorder Status) - The total number of requisitions with no shipment or receipt data.
3. Backorders – A count of the number of unfilled requisitions at the contractor's plant older than number of days specified.
4. Mean Backorder Age – Average of the number of days a requisition is 'backordered' at the vendor.
5. Requisition Open Past ESD (Estimated Shipping Date) – Count of requisitions open past the vendor's Estimated Shipping Date or PBL contract original delivery date.
6. Logistics Response Time (LRT) – The average time between generation of a requisition and receipt of the material by the customer.
7. KTR Shipment Time – The average time between referral/award date and shipment to the customer (turnover to freight carrier).
8. KTR Carrier Shipment Time – The average time taken for a freight carrier to deliver material to the first destination deliver point.
9. Total KTR and Carrier Response Time – The average total time between the contractor's receipt of an order and the receipt of the item at the first destination consignee.
10. Requisition Processing (Total Number Closed Requisitions) – the total number of requisitions with a valid ship date.
11. Requisitions Open Past Requisition RDD (Required Delivery Date) – Count of requisitions open past the Requisition Required Delivery Date.

TABLE 8: NAVY PERFORMANCE METRICS

Incentives and metrics also link to the factors of risk, uncertainty and complexity. The greater the risk, uncertainty and complexity the greater the level of incentive required to ensure successful completion of tasks. In the typical marketplace, if a firm engages in an activity where the risk is great, the uncertainty is high, and the complexity difficult, the stockholders expect profits to increase with the level of effort.

Contracting offers a variety of mechanisms to protect the government and reward the service providers. Specifically, the mechanisms include Award Fees, Graduated Award Fees, Award Terms, Fixed Fees and Fixed Terms. The following Table provides a comparison of selected incentives.

COMPARISON OF SELECTED INCENTIVES
Award Fee The Government determines and measures a contractor's performance within specifically designated performance categories, evaluation criteria, and evaluation periods.
Targeted Use: Cost Reimbursement and Fixed Price Contracts, **Benefits:** Plan can be revised when necessary to adapt to program changes. 2. Can be adapted to flow down as individual worker bonuses, making the incentive real and personal. 3. Incentives can be based on simple, reasonable, achievable, and measurable performance. 4. Can construct based on the acquisition. 5. All profit/fee can be based on performance.
Weaknesses: 1. Requires careful review of the statement of work. 2. Requires administrative time investment. 3. Requires carefully documented record of performance and consistent records. 4. Focus on end item performance. 5. Doesn't link contractor performance evaluation to Government actions. 6. Requires balance between cost, schedule, and task performance so that one area is not emphasized over another.
Process Elements: 1. Define the evaluation periods and the amount of award fee available for each period. 2. Describe the general procedures to determine the earned award fee for each evaluation period. 3. Define the evaluation criteria. 4. Identify the Fee Determining Official (FDO), the Award Fee Review Board (AFRB) members by position and the Performance Monitors by function with descriptions of their roles in the Award Fee Process.
Graduated Award Fee An approach to award fees that layers incentive elements.
Targeted Use: Competing areas of focus within a program. Where attention to "macro" or "overriding" elements of performance is required. Where there is a good understanding of the tradeoffs between performance levels. **Benefits:** Better attention to "macro" or "overriding" performance elements. Improved synthesis of performance elements (inability to maximize one element at the expense of another). Flexibility in establishing the "right" performance hierarchy for a particular requirement.
Weaknesses: 1. Requires substantial resources to manage. 2. Impact of award fee incentive can be magnified negatively if "wrong" higher-level performance element.
Process Elements: As an example, the first layer of award fee elements might include strong technical performance in an area, on-time schedule performance as indicated by milestone achievement, and application of a cost tool such as CAIV. The next and "higher" level of award fee might be overall cost control. During award fee review and determinations, the first layer of elements are assessed and assigned "pure" element values. An overall award fee is established based on this first layer. This award fee then is subject to adjustment, up or down, based on evaluation of the higher-level award fee.
Performance Based Incentives Effective performance-based contracts: define work in measurable, mission related terms; contain performance standards; include quality assurance plans for measuring performance; and provide financial incentives and penalties based on performance.
Targeted Use: Includes quality performance and may be positive, negative, or a combination of both. Should be applied selectively to discourage inefficiency and to motivate contractor efforts that might not otherwise be emphasized. **Benefits:** 1. Profit is tied to achievement of specific technical performance objectives, delivery schedules, or cost control objectives. 2. Can combine multiple incentive arrangements within a single contract (e.g. use both an incentive fee as well as award fee combined with cost reduction incentives.) 3. Directs contractor management attention to desired performance. 4. Improves communication.
Weaknesses: 1. Requires real communication between the parties and within the Government organization to ensure that performance objectives, measures, and any other incentives are understood as part of the overall objectives of the program. 2. Structuring all incentives to work together and drive the desired contractor behavior is likely to be complex. 3. Processes and procedures for the application incentives must be documented and understood. 4. Care must be taken to ensure there is a balance in the incentives. 5. Requires constant monitoring and attention. May create complex administrative tasks. Cost tracking at the performance level must ensure baselines are followed.
Process Elements: Should be challenging, yet reasonably attainable. The goal is to reward contractors for outstanding work but not penalize them for work that is fully satisfactory but less than outstanding. The definition of standard performance, maximize positive and negative performance incentives, and the units of measurement should be established in the solicitation. Care must be taken to ensure that the incentive structure reflects both the value to the Government of the various performance levels and a meaningful incentive to the contractor. The incentive amount should correspond to the difficulty of the task required but should not exceed the value of the benefits the Government receives.

Targeted Use: Establishment of long-term contractor relationships with proven producer of products or services. Designed to incent the contractor to execute an orderly transition of workload, provide superior support, and control prices. Benefits: 1. Strongly incents contractor performance. 2. Supports long-term sources of quality services and products. 3. Enables supplier to make investments in process improvements that it might not otherwise make when facing short-term or uncertainty in periods of performance. 4. Allows Government to extend performance parameters and accelerating completion. 5. States Government priorities explicitly and gives contractor more autonomy in achieving desired results. 6. Contractor knows the expected outcome up-front and the requirements for success.
Weaknesses: 1. Can be a challenge to monitor contractor progress accurately. 2. Reward must be sufficient to drive desired behavior throughout contract performance. 3. Can be a challenge to define the reward scheme precisely so that it drives proper behavior. 4. Care must be taken in assessing pricing for extension periods.
Process Elements: 1. Structure similar to award fee but the incentive is periods of performance rather than cash. 2. Effective if performance metrics are objective. 3. Effective when a long-term business relationship is of value to the Government and the contractor. 4. Points are awarded during each year of the contract based on performance in each performance measurement category. 5. Decisions on extending or shortening the award term are made on a year-by-year basis, based on a moving multi-year average of the contractor's overall point total. 6. Extensions can be set, based upon performance that exceeds requirements rather than just meeting requirements.
Share in Savings (SIS) Strategy Encourages contractors to apply ingenuity and innovation to get the work done quickly and efficiently and share in the savings attributed to their planning and execution.
Targeted Use: Best used when ROI is big enough to make this a viable business proposition for the contractor. Shifts risk from Government to contractor with commensurate opportunity for contractor reward for successful performance. Requires partnership approach between Government and contractor due to risks involved. Idea is to allow contractor to apply ingenuity and innovation to efficiently deliver the requirement instead of dictating the Government preferred approach. Can be added to FP for critical areas. Can also guarantee no fee, promising payment only when benefits result from the contractor's efforts. **Benefits:** 1. Requires real communication between the parties and within the Government organization to ensure that performance objectives, measures, and any other incentives are understood as part of the overall objectives of the program. 2. Structuring all incentives to work together and drive the desired contractor behavior is likely to be complex. 3. Processes and procedures for the application incentives must be documented and understood. 4. Care must be taken to ensure there is a balance in the incentives. 5. Requires constant monitoring and attention. May create complex administrative tasks. 6. Cost tracking at the performance level must ensure baselines are followed.
Weaknesses: 1. The Government and the contractor must agree if there is a decision to re-invest. 2. The financial mechanics may be difficult to arrange given the issues with comptroller processes and the current appropriation laws.3. May be difficult for small businesses to participate as primes (this form of contract may often require upfront contractor investments that are paid back only in out years.)
Process Elements: 1. Need to be able to establish baseline and methodology for calculating benefit pool. The baseline and methodology do not need to be perfect, as long as there is advance notice of what the baseline or methodology is, contractor buy-in, and consistent application post-award. 2. The Government identifies a monetary benefits pool that successful contract performance will achieve. The benefit pool may by "on-budget" (e.g. reduced O&M spending or reduced spare parts procurement) or "off-budget" (e.g., improved system performance, decreased downtime). 3. The Government then pays the contractor an agreed upon portion of the monetary benefits earned under the contract. In a 100% share-in savings contract, the contractor's entire payment is in the form of a percentage of benefits realized. Alternatively, the contractor may be paid a base fee/profit plus a (smaller) percentage of the benefits. In a reinvestment variation, there can also be an election by the contractor to reinvest all or part of that savings.
Early Completion Bonus Incents early delivery of product or service.
Targeted Use: Best used when value of early completion is clear and value can be established for reward. Benefits: Places premium on schedule performance.
Weaknesses: 1. Requires balance between other program objectives and schedule to ensure all requirements are met. 2. Requires careful evaluation and substantiation for value of early completion.
Process Elements: 1. Offerors bid a target completion date as well as a schedule of rewards or penalties for deviation from the target completion date. 2. Both the target and the reward or penalty structure should be evaluation criteria for source selection of competitive procurement.

TABLE 9: COMPARISONS OF SELECTED INCENTIVES [28]

Technology Management

We looked at two types of technology management: the technology insertion required to prevent weapon system obsolescence, and the business technology solutions required to improve the supply chain.

The consensus for weapon system technology management is the

1. OEM has an advantage early in the development/fielding cycle of the system

2. Technology insertion/obsolescence is best managed by the OEM.

The Comanche, C-17's, B1-B's, C-5's, JSTARS, and the Soldier Focused Logistics (SFL) initiatives have all recognized the need to use management information systems to collect logistical, historical and operational data in order to study specific aspects of fleet management. SFL begins at the aircraft, where operational, maintenance and fault data records are loaded into the Advanced Maintenance Aid Concept (AMAC) system. The AMAC has established a machine readable, unique ID for each system part and uses an E-Card to provide the soldier mechanic with all maintenance task information in a web accessible format. The data collection is accomplished through application of the Reliability Centered Maintenance II process, an in-depth maintenance analysis of the aircraft system.[29]

PBL requires the real-time monitoring and sharing of information across government and contractor information systems. DoD established requirements to implement an integrated product data environment (IPDE). DLA is using the implementation of its Business System Modernization technology as a way to bring commercial best practices into it logistics operation. The Army's Logistics Modernization System (see Appendix I for a description) is also adopting best commercial business practices and associated technologies to form new, modern enterprise resource planning (ERP) business automation tools.

Leading commercial organizations have recognized that the key to success in logistics is the extension of the information system beyond the classical dimensions of planning and control to a virtual 'marketspace'[30] of electronic commerce.

UPS and Caterpillar are leveraging information technology and transportation knowledge into new companies — Supply Chain Solutions. They make use of their networks to help clients integrate their fragmented operations, reduce costs and increase effectiveness.

The basis for competition between commercial firms is often technology. Companies sell their products by providing the latest technology enhancements to their customers. When Dell wanted to purchase a new line of microprocessors, they informed the

manufacturers (Intel/AMD) to include wireless technology. The manufacturers worked closely with Dell to develop the needed technology. For Intel to secure the order they had to produce the product Dell needed. If AMD can produce the chip, then it will win the Dell contract. When Intel or AMD produces the chip with wireless capability, Dell includes it in their products.

In the case above, Intel and AMD invested their funds to integrate the wireless capability into its microprocessors. Dell did not oversee or approve the changes to the chip but worked with both to keep them informed about customer's needs. The government must determine the level of control it wants to allow the contractor to have. The Army Aviation representatives interviewed all required the contractor to follow a specific procedure when the technology impacts flight safety. The PBL environment must be flexible enough to provide the proper incentives for contractors and to accommodate the administrative process for testing requirements. In essence, complexity and risk must be analyzed for every technical enhancement.

With the government, quite often the approval process is the reason technology enhancements are slow. We found two programs, Army Value Engineering and Navy LECP, with streamlined approval processes. Both programs have also established mechanisms to fund technology insertion, reduce sustainment cost, and increase readiness. Since funds are not available for all technology needs, the LECP uses an Opportunity Index to select the most critical projects. Prior to investing WCF, the NAVICP obtains customer (fleet) commitment to purchase proposed changes for applicable systems.

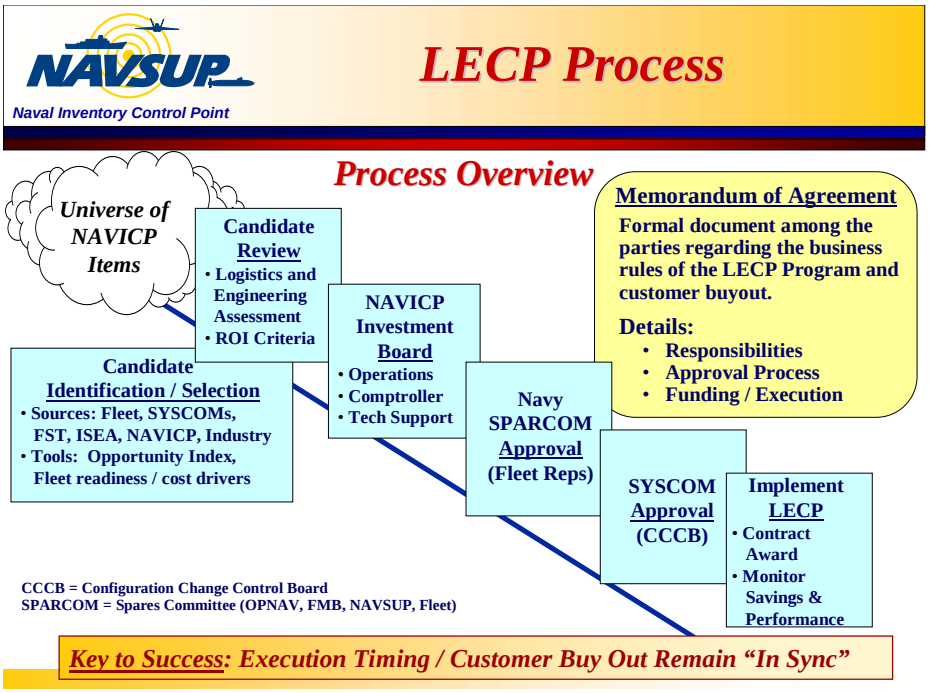


FIGURE 18: LECP PROCESS

The results for both the Navy and Army programs have been very positive.

NAVY LECP EXAMPLES OF GROSS SAVINGS
• ***E-2C Voltmeter*** – reliability was 371 hrs…now 8,155 hrs…total investment $410K… total gross savings $1.06M • ***HOSS Camera*** – reliability was 5,884 hrs…now 11,540 hrs…total investment $510K…total gross savings $1.17M • ***F/A-18 Inertial Nav*** – reliability was 400 hrs…now 3,600 hrs…total investment $50.1M…total gross savings $110.44M • ***NATO Sea Sparrow Mk 73 Xmtr*** - reliability was 500 hrs…now 25,000 hrs. total investment $3.5M…total gross savings $14.27M • ***S-3 Gyro*** – reliability was 271 hrs…now 1,293 hrs…total investment $5.22M…total gross savings $16.35M • ***SH-60F Transmitter*** – reliability was 675 hrs…now 3,726 hrs…total investment $2.74M…total gross savings $7.47M • ***H-46Gyro*** – reliability was 155 hrs…now 1,513 hrs…total investment $11,71M…total gross savings $23.50M

TABLE 10: LECP SAVINGS

DLA also has a Value Engineering (VE) Program. DLA uses the VE Program to award employees for improvements to the logistical services and processes rather than product technology improvements. Major savings have also been realized as a result of this program. (See Appendix II for other DLA Best Practices.)

DLA ACHIEVEMENT AWARDS FOR 2002			
Outstanding Project Team	Defense Supply Center – Richmond	Partnered with Navy to identify two additional qualified procurement sources for engine non-metallic busing sleeve	Initial savings of $1,335,235
Outstanding Individual Award	Defense Supply Center - Columbus	Consistently improving the procurement process resulting in better supply availability at a more economical cost.	$5.7M for FY2001 115-1 return
Organization Award	Defense Supply Center – Richmond	Proactively teamed with military services and private sector to reduce weapon system life cycle cost and provide new sources	$50M for FY 2001, 20-1 return
Special Individual Award	Defense Supply Center – Philadelphia	Identified discrepancy between Army budget requirements shortage of 1.4M cases of MREs with actual surplus of 2.33M cases in war reserve	FY 2001 cost avoidance of $14.8 M will exceed $52 M
Special Individual Award	Defense Supply Center – Richmond	Individual service as VE program manager with DLA from 1987 – 2001 with multiple awards for outstanding field command	Savings and cost avoidance exceeding $456M with a ROI of 16 to 1

TABLE 11: DLA ACHIEVEMENT AWARDS FOR 2002

GAP ANALYSIS

We identified six major gaps between what we perceived to be AMCOM's current business operation and the best practices from Defense and industry. We have provided background on the contributing factors for each gap in the body of the report.

Gap 1: The best PBL organizations embrace a "customer oriented" culture. They focus their efforts on exceeding customer expectations and creating value for the customer. They have transformed their organizations to be proactive in meeting customer needs rather that being reactive to requests. AMCOM must develop a customer-oriented culture. In the recommendation section we outline how to measure the culture and implement a plan to change to the desired state.

Gap 2: The best organizations fully understand costs. High performing organizations understand what affects costs and are able to compare alternatives. The AF allows competition between logistic centers. The Navy uses a BCA approach to evaluate alternatives. The BCA reflects cost for both organic and commercial alternatives.

Gap 3: The best organizations understand how to evaluate opportunities for PBL implementation. We have presented a framework for analysis that includes the dimensions of risk, uncertainty, and complexity. AMCOM must develop a methodology for deciding what should be the first priority for PBL. This decision methodology should include an analysis of the dimensions of risk, uncertainty and complexity along with the system's life cycle.

Gap 4: The best organizations use the appropriate incentives to motivate the appropriate behavior. Incentives must be developed to provide the framework for building long-term relationships with partners. The incentives must be of the right type (i.e., award fees, award terms, etc.) and at the right level. AMCOM must carefully draft incentives to promote **right** behaviors.

Gap 5: The best organizations know how much control to retain. This is at the heart of defining "core" capability. AMCOM must make a thorough assessment of core functions and determine how many to maintain. Navy and AF have made these determinations and are obtaining support through partnerships and contracts.

Gap 6: The best organizations proactively manage technology change by using resources wisely. Just as Intel and other companies use their profit to advance technology, government organizations must also find the funds to create a new roadmap for providing products and services. AMCOM must develop a methodology for funding and promoting new technology for both system and business operations. The methodology should include an ROI analysis and an assessment of the technological and organizational change necessary to implement. This is not to imply that change is optional, in many cases it is the only way to stay in business.

RECOMMENDATIONS

To fill Gap 1 AMCOM needs to obtain feedback about its current culture and use the feedback to design an improvement plan.

- Measure the current culture
    - The Denison Model (or a similar model) should be administered to benchmark the current culture, and plan to re-administer it periodically. (See DLA Best Practices in Appendix II for more details.)
- Communicate the desired changes to the internal organization
    - A communications plan should be developed to make people aware of the pending changes, and why change is needed.
- Develop a detailed change management plan
    - The detailed plan should clarify the key points and create a basis for understanding the need for change.
- Assign responsibility
    - This person should have the authority to lead change and allocate resources to insure success.

- Align responsibility and organizational capability
    - Wherever possible, co-locate AMCOM support employee with customers.
    - Begin to develop life cycle managers. Make plans to assume the role of the system integrator and create the capabilities and talent to succeed. The preparation should begin immediately.

To fill Gap 2 AMCOM should benchmark the financial management model used by General Babbitt in his change effort at the AFMC.

- Continue to pursue ABC or other methods to identify actual cost.
- Begin the BCA process. Training should be conducted to provide consistent analysis of alternatives.

To fill Gap 3 AMCOM needs to create an organization to support PBL implementation and candidate selection.

- Develop the necessary skills.
- Partner with other commands or military services.

To fill Gap 4 AMCOM should initiate frank discussions with employees, key contractors and organic partners to identify what incentives they value.

- Use a third party to facilitate discussions.
- Open doors to honest communications.

To fill Gap 5 AMCOM management must realistically evaluate current levels of control and what it is willing to accept.

- Define the true core capabilities.
- Partner with other military services and industry to accomplish the effort.
- Invite stakeholders to participate.

To fill Gap 6 AMCOM should develop an opportunity index similar to the Navy model.

- Use to prioritize funding for technology enhancements and re-engineering efforts.
- Evaluate all approval processes and determine value added.

- Re-engineer as appropriate, streamline and use information technology to create faster, more efficient processes.

- Empower employees and contractors to make changes based on return on investment (ROI).

    - Develop a solid understanding of ROI measurement.

    - Use data to make decisions.

APPENDIX I:

Study Documentation

CMOST PBL Study Interview List				
First Name	**Last Name**	**Title**	**Program**	**Company**
Lisha	Adams	Acting Principal Assistant, Deputy Commander for Systems Support	U.S Army Aviation & Missile Command	Deputy to the Commander for Systems Support
Dean	Anderson			IMMC
William	Andrews	Director	Attack Directorate	IMMC
Matthew	Atkinson	Logistics Engineer, PBL Program	Electronic Systems	Raytheon Electronic Systems
Richard	Basham	Supplier Manager	Direct Vendor Delivery	Raytheon Electronic Systems
Thomas	Beil	Director, Site Operations	Intergraph Solutions Group	Intergraph
Lowell	Bidwell	Director	Utility Directorate	IMMC
Willie	Bowman		C-5 Program	Warner Robins Air Logistics Center
Daniel	Brennan	Program Manager	Depot Systems Business Development	Raytheon Indianapolis
Marvin	Bromell	Project Requirements Management	Supply Chain Common Operating Picture	Intergraph SCCOP
Dianne	Brown	Secretary	Joint STARS Program Office	Joint STARS
Frank	Camm	Senior Economist	RAND	RAND
Ed	Connolly	Colonel	C-5 Program	Warner Robins Air Logistics Center
Betty	Cook	Deputy, Systems Support Manager	Joint STARS Program Office	Joint STARS
Lawrence	Croll	Operations Research Analyst	Naval Inventory Control Point	NAVSUP
Tommy	Cutts	Director AMSAM-MMC-MS-M	Medium Range/Close Combat Directorate	PEO Missiles
James	Danielson	Colonel	Aircraft Division Directorate of Maintenance	Warner Robins Air Logistics Center
Jeffrey	Danis	Vice President, Supply Chain Management	Royal Caribbean Cruises Ltd	Royal Caribbean Cruises Ltd.
Cathy	Dickens	Director Maintenance And Special Project Directorate	Acquisition Center	AMCOM
John	Eagles	Public Affairs Officer	Public Affairs and Communication	Raytheon Missile Systems
Stan	Garriaty		MSG-3	Intergraph MSG-3
Larry	Garvey	Director	Supply Chain Solutions Division	NAVSUP
James	Grant	Chief, Contracting Division	C-5/C-17/C-141	Warner Robins Air Logistics Center
Jim	Grason	Director, Contract Management		Wesco Aircraft
Mike	Gray	Senior Manager, Global	Dell Computer	Dell Computer

CMOST PBL Study Interview List				
First Name	**Last Name**	**Title**	**Program**	**Company**
		Supply Chain Strategies	Corporation	Corporation
Mary	Haga	Chief ILS/Manprint Branch	Maintenance Directorate	IMMC
Phil	Hamilton		C-5 Program	Warner Robins Air Logistics Center
Don	Harlan		CPI Lean Logistics Program	Intergraph CPI Lean Logistics
Ron	Harlow	Executive Manager	Army Government Solutions Division	Intergraph
Gordon	Hearnsberger	Aviation Logistics Specialist	Cargo Directorate	PEO AVN
Bruce	Hecker	PBL Office	NAVAIR	NAVAIR
Pat	Heyland	Major	Cargo Directorate	PEO AVN
Larry	Hill	Director, ILS Policy	SAAL-LP	SAAL-LP
Gary	Hogarth	Program Manager	JSTARS Program Management	Northrop Grumman Corporation
Anthony	Horton	Director	Logistics	Dynetics, Inc.
Tony	Houweling		Logistics Programs	TITAN Systems Corporation
Hank	Humphries	Publications	Cargo Directorate	AMCOM
Paul	Joyce	Lt. Colonel Chief	B-1 Contracting Division	B-1 Contracting Division
Carlos	Kingston	Logistics Chief	Theater High Altitude Area Defense Project Office	MDA
Marcia	Klein	Media Relations	Defense Logistics Agency	Defense Logistics Agency
Ron	Klein	Chief Executive Officer		Belzon
Paul	Kube	Assistant Deputy of Logistics	C-17 Program Office	C-17 Program Office
Jay	Lasher	Logistics Engineer	USAMC	LOGSA
Tom	Lavin	Chief, Logistics Division	PM Aviation Systems	PEO Aviation
Edward	Lawler	Senior Aviation Analyst	Comanche	Belzon
Catherine	Leach	Commander	Deputy Chief of Staff for Operations, G-3	G-3
Dennis	Loeffelholz	Manager Applied Systems	Northrop Grumman Corporation	TASC
John	Lowe	Strategic Business Development	Customer Support Military	Parker Aerospace
Robert	Matthews	Col USAF (Ret) Vice President Dayton Aerospace	Program Management, Risk Management, Integrated Product & Process Development	Dayton Aerospace, Inc.
Judith	McCoy	Director, Logistics	Mobility System Program Office	Aeronautical Systems Center
Dusty	McGee		Theater High Altitude Area Defense Project Office	MDA
Ron	McLean	Director International Sales and Marketing		Kitco, Inc.

CMOST PBL Study Interview List				
First Name	**Last Name**	**Title**	**Program**	**Company**
Bruce	Metzger	Associate Executive Director, Acquisition Center	U.S Army Aviation & Missile Command	Systems Support
Kevin	Muir	Chief	Acquisition Logistics B1-B Bomber	B1-B Bomber
John	Nauseef	Brig Gen USAF (Ret)	Financial Management, Program Management	Dayton Aerospace, Inc.
Douglas	Newcomb	Vice president sales		Kitco, Inc.
James	Olfky	Contracts and Pricing	Integrated Defense Systems	Boeing
Marilyn	Phillips	Division Chief	Maintenance Operations and Support Division	IMMC
Gary	Poleskey	Col USAF (Ret) Vice President Dayton Aerospace	Contracts, Procurement Law, Program Managment	Dayton Aerospace, Inc.
Keith	Reel	Comanche	PM Aviation Systems	PM Aviation Systems
John	Richardson		MABA	Warner Robins Air Logistics Center
Michael	Rovinsky	Project Leader	MSG-3	Intergraph MSG-3
Edward (Ted)	Schmidt	Logistics Management Specialist	Project Manager's Office for Cargo Helicopters	PEO AVN
Roger	Schwerman	Associate Director Engineering	Theater High Altitude Area Defense Project Office	MDA
George	Shaw	Director of Marketing		Innolog
Nancy	Shiver	Secretary	C-5/C-17/C-141	Warner Robins Air Logistics Center
Michael	Slocum	Aviation Systems Analyst	Army Systems Ops.	AEPCO
Teddie	Stokes	Director	Cargo Directorate	IMMC
Robert	Sullivan	Product Integration & Assessment	Precision Fires Rocket and Missile Systems	PFRMS Champion
Gerald	Tonoff	Contracting Officer	Naval Inventory Control Point	NAVSUP
Tony	Van Houweling	Logistics Programs	TITAN	TITAN Systems Corporation
Hal	Weinstein	Vice President Sales and Marketing		Wesco aircraft
William	Whipple	Director, Southeast Operations		Innolog
Stephen	Whittaker	VP for Procurement	U Toronto Services	Procurement at U Toronto Services
Jerry	Williams	Material Budget Division	NAVICP	NAVICP
Roy	Willis	Business Unit Leader	Army/NASA	Intergraph Solutions Group
Dale	Wise		C-5 Program	Warner Robins Air Logistics Center

TABLE I-1: CMOST PBL INTERVIEW LIST

STATUTORY AND REGULATORY PROVISIONS RELEVANT TO PERFORMANCE BASED LOGISTICS		
Authority	**Title**	**Description**
10 U.S.C.2208	Working-Capital Funds	Implemented to effectively control and account for the cost of programs and work performed in the Department of Defense
10 U.S.C.2208(j)	Direct Sales Of Items	Permits depot financed through working capital funds to sell articles and services outside DoD if the purchaser is fulfilling a DoD contract and the contract is awarded pursuant to a public-private competition.
10 U.S.C.2469a	Use of competitive procedures in contracting for performance of depot-level maintenance and repair workloads formerly performed at certain military installations	Requires competitive contracting (and authorizes public-private competition and teaming) when outsourcing workloads formerly performed at depots that have been closed or realigned (BRAC).
10 U.S.C.2474	Centers of Industrial and Technical Excellence: designation; public-private partnerships	Requires the Military Departments to designate depot maintenance activities as Centers of Industrial and Technical Excellence(CITEs), authorizes and encourages public-private partnerships, permits performance of work related to core competencies, permits use of facilities and equipment, and permits sales proceeds from public-private partnerships to be credited to depot accounts.
10 U.S.C.2563 (formerly 10 U.S.C. 2553)	Articles and services of industrial facilities: persons outside the Department of Defense	Authorizes sale of articles or services outside DoD (excluding those authorized under 10 U.S.C.4543) under specified conditions.
10 U.S.C.2667	Leases: non-excess property of military departments	Allows leasing of non-excess facilities and equipment.
10 U.S.C.4543	Army industrial facilities: sales of manufactured articles or services outside Department of Defense	Authorizes Army industrial facilities that manufacture cannons, gun mounts, etc., to sell articles or services outside DoD under specified conditions.
10 U.S.C.7300	Contracts for nuclear ships: sales of naval shipyard articles and services to private shipyards	Authorizes Naval shipyard sales of articles or services to private shipyards for fulfillment of contracts for nuclear ships.
22 U.S.C.2754	Purposes for which military sales or leases by the United States are authorized	Allows sales or lease of articles or services to friendly countries under specified conditions.
22 U.S.C.2770	General authority	Allows sales of articles and services to a U.S. company for incorporation into end items to be sold to a friendly foreign country or international organization under specific conditions.
FAR 45.3	Providing Government Property to Contractors	Provision of government-furnished material, facilities, and equipment to contractors.
FAR 45.4	Contractor Use and Rental of Government Property	Provides for contractor use and rental of government property.
10 U.S.C.2539b	Availability of samples, drawings, information, equipment, materials, and certain services	Authorizes the sale of services for testing of materials, equipment, models, computer software, and other items.
10 U.S.C.2460	Definition of depot-level maintenance and repair	Material maintenance or repair requiring the overhaul, upgrading, or rebuilding of parts, assemblies, or subassemblies, and the testing and reclamation of equipment as necessary, regardless of the source of funds for the maintenance or repair or the location at which the maintenance or repair is performed
10 U.S.C.2465	Prohibition on contracts for performance of firefighting or security-guard functions	Prohibits the spending of DoD funds for the purpose of entering into a contract for the performance of firefighting or security-guard functions at any military installation or facility
10 U.S.C.2451	Defense supply management	Allows the Secretary of Defense to develop a single catalog system and related program of standardizing supplies for the

STATUTORY AND REGULATORY PROVISIONS RELEVANT TO PERFORMANCE BASED LOGISTICS		
Authority	**Title**	**Description**
		Department of Defense
10 U.S.C.2452	Duties of Secretary of Defense	Describes the duties of the Secretary of Defense
10 U.S.C.2453	Supply Catalog: distribution and use	Allows Secretary of Defense to distribute the parts of the supply catalog as they are completed
10 U.S.C.2454	Supply Catalog: new or obsolete items	After any part of the supply catalog is distributed, only the items listed in it may be procured for recurrent use in the Department of Defense. Obsolete items may be deleted from the catalog at any time
10 U.S.C.2456	Coordination with General Services Administration	To avoid unnecessary duplication, the Administrator of General Services and the Secretary of Defense shall coordinate the cataloging and standardization activities of the General Services Administration and the DoD
10 U.S.C.2457	Standardization of equipment with North Atlantic Treaty Organization members	Allows for the standardization of equipment used by the armed forces of the United States stationed in Europe making it interoperable with equipment of other members of the North Atlantic Treaty Organization
10 U.S.C.2458	Inventory management policies	Allows the Secretary of Defense to issue a single, uniform policy on the management of inventory items of the DoD
10 U.S.C.2461	Commercial or industrial type functions: required studies and reports before conversion to contractor performance	States that a commercial or industrial type function of the DoD may not be changed to performance by the private sector until the Secretary of Defense fully complies with the reporting and analysis requirements
10 U.S.C.2462	Contracting for certain supplies and services required when cost is lower	Allows the Secretary of Defense to outsource supplies or services necessary if the cost is lower than the cost of at which the Department can provide the same supply or service
10 U.S.C.2463	Collection and retention of cost information data on converted services and functions	Allows the Secretary of Defense to collect cost information data regarding performance of the service or function by private contractor employees in regards to converting the performance of a service of the DoD to contractor performance
10 U.S.C.2464	Core logistics capabilities	Allows the Secretary of Defense to identify the core logistics capability that is Gov. owned and operated to ensure a ready and controlled source of technical competence and resources necessary to ensure effective and timely response to mobilization, national defense or emergency requirements
10 U.S.C.2466	Limitations on the performance of depot-level maintenance of material	States that no more than 50% of the funds made available in a fiscal year to a military dept. or Agency for depot level maintenance and repair workload may be used to contract the performance of non-Federal Government personnel
10 U.S.C.2469	Contracts to perform workloads previously performed by depot-level activities of the Dept. of Defense	Allows the Secretary of Defense to ensure that the performance of a depot level maintenance and repair workload is not changed to performance by a contractor unless the change is made using merit based selection procedures for competitions among all depot level activities of the DoD or competitive procedures for competitions among private and public sector entities
10 U.S.C.2470	Depot-level activities of the Dept. of Defense: authority to compete for maintenance and repair workloads of other Federal agencies	States that a depot level activity of the DoD shall be eligible to compete for the performance of any depot level maintenance and repair workload of a Federal agency for which competitive procedures are used to select the entity to perform the workload
10 U.S.C.2472	Management of depot employees	States the civilian employees of the DoD may not be managed on basis of any constraints or limitations in terms of man years, end strength, full-time equivalent positions or maximum number of employees
10 U.S.C.2473	Procurements from the small arms production industrial base	Requirement to limit procurement to certain sources

STATUTORY AND REGULATORY PROVISIONS RELEVANT TO PERFORMANCE BASED LOGISTICS		
Authority	**Title**	**Description**
10 U.S.C.2475	Consolidation, restructuring, or re-engineering of organizations, functions, or activities: notification requirements	Requires the Secretary of Defense to submit to Congress each Strategic Sourcing Plan of action for the DoD for the following year
10 U.S.C.2572	Documents, historical artifacts, and condemned or obsolete combat material: loan, gift, or exchange	Allows the Secretary to lend or give certain items mentioned to a municipal corporation, county or other political subdivision of a state, a servicemen's monument association, a museum, historical society, unit of war veterans, or post of the Sons of Veterans Reserve
10 U.S.C.2574	Armament: sale of individual pieces	Allows for the resale of a piece of armament that can be advantageously replaced and that is not needed for its historical value for no less than cost if the Secretary concerned considers that there are adequate sentimental reasons for the sale
10 U.S.C.2575	Disposition of unclaimed property	Allows the Secretary of any military dept. and the Secretary of Transportation to dispose of all lost, abandoned, or unclaimed personal property that comes into the custody or control of the Secretary's dept.
10 U.S.C.2576	Surplus military equipment: Sale to state and local law enforcement and firefighting agencies	Allows the Secretary of Defense to sell to State and local law enforcement and firefighting agencies, at fair market value, pistols, revolvers, shotguns, ammunition, gas masks, and protective body armor which are suitable for the agencies

TABLE I-2: STATUTORY AND REGULATORY PROVISIONS RELEVANT TO PERFORMANCE BASED LOGISTICS

AMC PBL ISSUES		
	Subject	**Problem Being Addressed**
1	Identify and understand contracting enablers and barriers	PBL has surfaced a lack of knowledge of contracting impacts to PBL implementation
2	Understand Statement of Objectives (SOO) and Statement of Work (SOW) process	PBL surfaced lack of knowledge of how to develop SOWs and Performance Based Agreements (PBA)
3	Identify legal and/or contractual impediments to PBL implementation within AMC's (Army Material Command) business processes/practices	PBL requires buying results not resources; uses performance specifications not design specifications and assigns responsibility to supplier—what is impact on current processes?
4	Examine AMC business processes for PBL-driven revisions	Position AMC as a competitor for providing the "best value" to the PEO/PM community
5	Expand PEO/PM understanding of AMC business processes and practices	Since no longer in chain of command PEO/PM ***may overlook key processes*** that should be integrated into planning of Supportability strategies for their systems
6	Address known shortfalls in policy and guidance	PBL emphasis on spiral development and sustainment creates procurement cycle of 20+ years and impacts financial and requirements planning.
7	Establish ***rules of engagement*** among MSCs (Major Subordinate Command) for the Product Support Integrator (PSI)	PBL provides the PMs/PEOs wide latitude in seeking solutions to acquisition sustainment. It is vitally necessary to ***establish rules and guidelines*** to govern PM/PEO and MSCs interface to ensure DOD is provided optimum return on its investment that now can reach decades into the future.
8	Establish rules of engagement among MSCs for the Product Support Provider (PSP)	New regulations do not require a PSP to be a member of the DOD community. They can be from the private sector. Such an arrangement may preclude any interface with the AMC community. Under this scenario, MSCs, Depots and Arsenals could find themselves in competition with each other, not only for designation as PSI but also as competing PSPs. In developing PBL guidance for the MSCs, AMC needs to address their interface as potentially competing PSPs.
9	Formulate PBL training plan	AMC command-wide lack of knowledge on how to implement an effective PBL program. Training at Army, MACOM (Major Command), and MSC levels is required.
10	Structure tracking mechanism	PBL requires a plan/process manage the implementation of PBL command-wide. Tracking Mechanism is required to track the various stages—tasks, actions, status, etc. of implementation.
11	Establish ground rules for engaging PMs	Under PBL, PMs are responsible for agreements with the warfighter and then with the PSI/PSP to deliver that performance. The complexity with collecting rules of engagement depends on the system involved and the war-fighter's capability requirements. It also depends on the PSI structure put in place by the PM. Since this issue involves multi-echelon oversight and involvement, participation in resolving it should come from the DA (Department of Army), AMC headquarters, and MSC level.
12	Establish procedures for lessons learned scorecard feedback	While lessons learned and performance data has been collected on other programs, concepts and doctrine there is no set of standards to judge performance, develop balanced scorecard criteria or collect lessons learned as the PBL process grows and matures.

AMC PBL ISSUES		
	Subject	**Problem Being Addressed**
13	Establish rules for problem resolution	The move of PEOs/PMs from AMC to ASA (ALT) (Assistant Secretary of the Army for Acquisition Logistics and Technology). Cancellation of the DoD 5000 series, designation of the PEO/PM as Total Life Cycle Systems Manager (TLCSM), and the implementation of PBL throughout DoD have created the potential for conflict within the Army's acquisition and sustainment communities.
14	Focus on the core capability retention	Plan use of AMC core capabilities within the implementation of PBL using enterprise integration as a vehicle to promote partnership, capture the expertise and maximize and ensure use of the AMC organic MSCs, arsenals, depot, laboratories, and the RDECOM (Research, Development, and Engineering Command).
15	Exploit partnerships	AMC, as an enterprise organization, must position itself to not only ensure compliance with statutory regulations, but also with government/industry partnering and PBL. AMC can further leverage these partnership requirements to expand its cored capabilities base through equipment modernization and workforce rejuvenation.
16	Establish reporting and monitoring structure and requirements	The range, depth and frequency of reporting and monitoring requirements for PBL initiatives and Performance Based Agreements (PBSs) within AMC must be established. Should be part of the balanced scorecard/feedback issue or vice versa.
17	Prioritize multi-Level metrics	Top level metrics to include asset visibility, inventory management, item identification, supply performance, and major end item management system are most visible within the AMC HQ, G3 Support Operations structure. Under PBL the PEOs/PM are responsible for agreements with the warfighter and then with the PSI/PSP to deliver that performance. Since this issue involves multi-echelon oversight and involvement, participation in resolving it should come from the DA, AMC Has, and MSC level.
18	Market AMC strengths	There appears to be no command marketing strategy or plan. AMC G5 focus seems to be on congressional liaison and some industrial spheres. Future participation and potential competition with the PBL framework necessitates AMC address this issue if it wishes to attract and convince potential customers to utilize its services. This should position AMC to fulfill its key PBL roles as part of overseeing, planning, and executing PBL within DA and DoD.
19	Compute Return on Investment (ROI)	The Depots ROI in terms of accepting work that is a "loss leader" needs to be addressed, as sustainment will now be performance-based. This is especially significant in light of the supportability strategy for FCS (Future Combat Systems) that questions what should the Army build vs. civilian industry; and the utilization of Army capability, particularly on those items that do not have great profitability for civilian firms.
20	Examine impact on security cooperation processes	With PBL, possible AMC business process/practice revisions must be reviewed in light of and in conjunction with current AMC Security Cooperation processes to ensure that customer satisfaction and readiness will not be adversely impacted. Security cooperation customer requests are centrally processed through the Army security cooperation database at USASAC (US Army Security Assistance), ensuring integrity of the government-to-government sales agreements.

AMC PBL ISSUES		
	Subject	**Problem Being Addressed**
21	Establish procedure to enable PBL to function under the funding regulations.	Under PBL we are selling performance and services, rather than individual parts. There are many categories of funding, e.g., AWCF (Army Working Capital Funds), OMA, OPS29, SSTS. It is unclear how to handle these items in this new partnering environment. Each category of funding has a distinct budgetary process and these processes may not fit easily within this new environment.

TABLE I-3: AMC PBL ISSUES

ARMY LOGISTICS MODERNIZATION SYSTEM

When the U.S. Army Materiel Command (AMC) awarded Computer Sciences Corporation (CSC) the original 10-year, $680 million contract in December, 1999, it was the first time a government agency had outsourced the current operation of a major IT system and the its entire modernization.. The contract also called for unprecedented cooperation with the contractor: Integrated Product Teams (IPTs) of both government and CSC employees were used to "manage the outsourcing and transition, not only of the 205 federal employees to CSC, but the workload, the processes, even the furniture and computers."

When CSC became the Army's information technology (IT) partner, they were tasked to reengineer and modernize the Army's 30-year old wholesale logistics business processes through the adoption of best commercial business practices and associated technologies to form a new, modern enterprise resource planning (ERP) business automation tools. During the first two years, CSC saved the Army about $8 million in reduced operating costs. According to CSC, the savings were made possible through the institution of standard processes, methodologies and tools, enforcing stringent performance standards, and doing more with a smaller workforce. While the original award to CSC focused on "Wholesale" logistics modernization, work is already under way to completely integrate the retail environment. (See also Single Stock Fund.)

CSC's compensation is directly tied to measurements around business process improvement and financial and customer satisfaction performance levels, including targeted levels of improvement in areas such as reduced source cycle time, increased inventory turns and improved perfect order fulfillment rates.

The Logistics Modernization Program (LMP) is designed to provide the Army with numerous integrated logistics management capabilities, including:

- Total asset visibility.
- A collaborative planning environment.
- A single source of data
- Improved forecasting accuracy
- and Real-time access to enterprise wide information.

The LMP, according to Gen. Paul Kern, commander of the AMC, is viewed as a "critical enabler to the operational transformation of our Army" and will give "AMC logisticians and senior managers a real-time common operating picture of the billions of dollars of inventory and associated financial actions they are responsible for."

INTERGRAPH
SOLUTIONS GROUP

INTERGRAPH: A COMMON OPERATING PICTURE FOR THE AIR FORCE SUPPLY CHAIN

Intergraph helps U.S. Air Force improve weapon systems availability with a complete view of asset status.

Air Force seeks a Supply Chain Common Operating Picture

The U.S. Air Force supply chain for repairable commodities begins with the forecast, purchase, manufacture, and distribution of a part; continues with its delivery to a source of repair; and ends with the distribution of the now serviceable asset to retail accounts and maintenance customers in order to return weapon systems to mission capable status. In this environment, key supply chain information exists in multiple data systems. The different systems often present different results to different users. To obtain a complete picture of the status of end items, Air Force supply chain workers must access multiple data systems. Users must log onto each system individually and then navigate to locate the information desired. Often the resulting information is untimely, inconsistent, or inaccurate. As a result, workers are unable to perform their job effectively, which ultimately impacts weapon system availability.

A process-centric environment of integrated information and business rules

Intergraph Solutions Group developed the Supply Chain Common Operating Picture (SCCOP) on a scalable, enterprise-class Global Combat Support System-Air Force (GCSS-AF)-compliant architecture accessible worldwide through the Air Force Portal. SCCOP captures and encapsulates business process rules for all levels of weapon system and supply chain manager (SCM) activity. Intergraph partnered with the Air Force to focus SCCOP on improving weapon system availability by providing personnel and organizations involved in supply chain support with total visibility of the overall Air Force supply chain. This is accomplished through the retrieval, display, and integration of information captured from multiple data sources.

SCCOP provides a common operational view of the total supply chain and provides details on all of the factors that affect weapon system availability. It provides high-level visibility of status information on all assets and requirements, in all conditions, at all locations from a weapon system perspective. In addition, users can drill down to view detailed information about the asset. SCCOP obtains each required data element from the identified authoritative source for this information. This visibility provides users across the supply chain with the information necessary to make quality decisions in a timely manner.

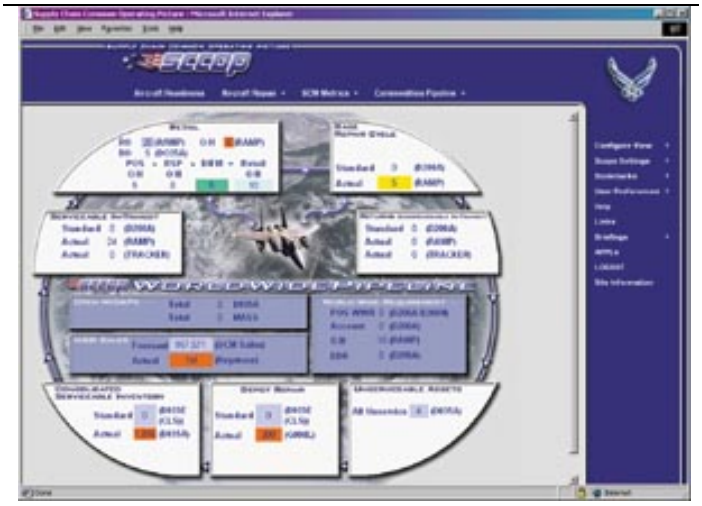
Central to the solution is the creation of business rules that take the entire supply chain into account. SCCOP's business rules are built in a process-centric environment considering the total supply chain. Using this viewpoint, business rules for the total supply chain supplant the sub-optimizing business rules of component functions and agencies, which only consider their specific portion of the supply chain. This is a unique feature not found in a typical system solution. In short, SCCOP acts as a process-centric supply chain integration engine.

Improved visibility, decision-making, and weapon system availability

SCCOP provides a common operational view of the total supply chain and provides details on all of the factors that affect weapon system availability. It provides high-level visibility of status information on all assets and requirements, in all conditions, at all locations from a weapon system perspective with drill down capability for additional details. By capturing and encapsulating business process rules, through the rigorous use of the RUP, for all levels of weapon system manager and SCM activity, it provides a process-centric view of the supply chain.

SCCOP fosters collaboration throughout the Air Force through the Air Force Portal. Weapon system managers and SCMs can track all parts throughout the supply chain, as well as support the management of repairables from the operational units through the Defense Logistics Agency and the depots.

SCCOP automates retrieving and collating data, and then combines this data into useful information. This allows workers to utilize collated information when performing their jobs without the need to cull through thousands of pieces of disparate data. The information is presented in a user-friendly format that allows SCMs to quickly distinguish problem areas and peel back summary information to identify specific causes so that personnel both up and down the supply chain can make rapid, intelligent decisions to enhance weapon system support processes.



SCCOP provides a Web-based interface to view multiple levels of data related to weapon system availability.

FIGURE I-1: SCCOP

SCCOP is built on a proven suite of state-of-the-art, commercial off-the-shelf (COTS) software.. The standards-based open architecture also facilitates rapid integration of other standards-compliant COTS and government off-the-shelf (GOTS) applications.

For additional information contact: Ron Harlow (rwharlow@ingr.com), (256) 7301521. For additional information on the products and services offered by Intergraph Solutions Group, please call 1-800-747-2232, email solutions@ingr.com, fax (256) 730-6816, or write to us at: 170 Graphics Drive, Madison, AL 35758.

BOEING C-17 CUSTOMER PROFILE PROCESS DOCUMENTATION

Know the Customer [31]

- *How well do you know your customer?*
- *Do you have a process for receiving customer feedback?*
- *Does your customer know how to find or give necessary information in your absence?*

Detailed information about the Department of Defense and military services can be found at http://www.defenselink.mil.

Before you can satisfy the customer, you must know the customer and his or her requirements and expectations. Often times, the customer's expectations are more specific or different from requirements. Needless to say, many of these things are unspoken or taken for granted and can result in misunderstandings or communication problems.

Customer Profile

The Customer Profile covers the basic information about the customer. It can be used as a standardized checklist when first meeting a new customer to ensure that all the appropriate information is known and recorded for future use. It is extremely valuable as a reference for the Alternate CCP and supervisor to use during a Primary CCP's absence or when training a new CCP.

Customer Contact Plan

The Customer Contact Plan describes a CCP's assigned customer interface. Included in the plan are the customer's principal interests, most important values, desired frequency of contact and areas of related interest in which the customer is expecting to be kept informed. Contact frequency may vary widely depending on the role the customer plays, individual customer preferences and the nature of the customer interaction activity.

The customer contact plan formally documents how customer interaction is to be implemented. The specific organization and content of a customer contact plan will reflect the size, needs and issues of the specific program, function or activity.

MSWord Templates

The Customer Satisfaction Team has prepared two MSWord files with a collection of potential items for the Customer Profile and Contact Plan. These files follow in this booklet, and can be downloaded from the Customer Satisfaction intranet website at http://ams-socal.lgb.cal.boeing.com/main/cussat/.

Customer Profile and Contact Plan Outline

The following describes suggested purpose and use:

	Customer Profile	Customer Contact Plan
Description	One-page Word document	One-page Word document
Purpose	Standardized format for gathering customer information	Standardized format for describing customer working relationship
Customer Satisfaction benefit	• Gathers basic knowledge about the customer • Records information to transfer to next CCP or alternate	• Ensures clear understanding of customer expectations of working relationship • Defines deliverables and schedule • Identifies opportunities to be proactive
Completed by	CCP	CCP
Frequency of update	• As soon as possible for new contact • Annually or as required • Same form can be edited and dated	• As soon as possible for new contact • Every six months or as required • Same form can be edited and dated
Management role	Review annually for manager awareness	Review every six months for: • Manager awareness • Resource requirements • Assess CCP performance • Opportunities for improvement • Provide reinforcement and recognition
Copies to	• Personal file • Immediate management • Alternate CCP	• Personal file • Immediate management • Alternate CCP

TABLE I-4: CUSTOMER PROFILE AND CONTACT PLAN OUTLINE

Customer Profile for (Customer Title/Rank FName MI LName):

Date of Report (mm/dd/yyyy):

Customer Data

Preferred Name:
Command (e.g., SPO, DCMC, etc.):
Location (e.g., WPAFB, Long Beach):
USAF Program (e.g., C-17, JSF):
Function/Position:
Other responsibilities:
Dept or IPT:
Office symbol (e.g., YCK):
Phone number (include area code):
Fax number (include area code):
E-mail address:
Mailing address:
City, State, ZIP:
Time in position (years, months):
Name of next level management:
Work hours and time zone:

- -

Primary Customer Contact Person Data

Primary CCP Name (FName MI LName):
Phone number (include area code):
E-mail address:
Boeing Program (e.g., C-17, Phantom Works):
Location (e.g., Long Beach):
Function/Position:
Dept or IPT:
Boeing Mail Code:
Time in position (years, months):
Work hours and time zone:

Alternate Customer Contact Person Data

Alternate CCP Name: (FName MI LName):
Phone number (include area code):

- -

Date of Report

Date of first report (mm/dd/yyyy):
Date of last update:
Date next update due:

- -

Management Review

Date of management review:
Management name (FName MI LName):
Comments:

Customer Contact Plan for (Customer Title/Rank, FName MI LName):
Date of Report (mm/dd/yyyy):

Primary CCP Name (FName MI LName):
Alternate CCP Name (FName MI LName):

Customer interface/function (e.g., Joint IPT Lead, CPAR monitor, Cog Engr-Wing, etc.):

Is there a documented process for receiving customer feedback? If yes, explain.

How often do you communicate/receive feedback?
Last date to confirm that frequency is adequate?

Relevant Boeing goals:
Relevant customer goals:

Shared processes (Process number & name):
Shared metrics:

Deliverables & schedule:
On what topics must the customer be kept informed?

Are expectations different than requirements? If yes, what are they?

What is the customer's definition of technical excellence?
What is the customer's definition of relationship excellence?

What are the customer's priorities?

-
-

What do you anticipate as future priorities?

-
-

In what other areas can improvement be made (ask the customer)?

1. Are there improvement actions currently underway?
2. Opportunities to be pro-active?

3. How would you assess/describe your customer relationship?
4. How would the customer assess/describe your customer relationship (ask the customer)?
5. Any other helpful notes?

APPENDIX II:

Best Practices From DoD

BEST PRACTICES FROM DEFENSE LOGISTICS AGENCY (DLA)

Performance Improvement Initiatives

DLA is streamlining its entire logistics pipeline.

- **Balanced Scorecard**, a widely used, very structured commercial approach where senior executives determine what direction, specific initiatives, and funding are needed to be successful. Using the scorecard, DLA formulated a transformation strategy for years to come. The strategy includes modernization of business practices, enhanced information operating systems and an emphasis on best commercial practices.

- **Business Systems Modernization** combines business processes with commercial software to streamline the supply chain process.

- **A-76 Competition** of all commercial-type activities have created a mix of public- and government-run operations and resulted in an average 25 percent net savings in labor cost. Automated printing services and disposal reutilization and marketing services have similar reductions.

- **Strategic supplier alliances**, becoming the manager of suppliers rather than the manager of supplies, allows DLA to rely on industry for support and to reduce inventory levels by hundreds of millions of dollars. The alliances are built around integrating organic supply chains, buying commercial supply chains or building "virtual" chains where the pieces exist and retooling acquisitions. Table BP-3 contains a few examples of DLA's corporate contract success stories.

- **Direct vendor delivery** is used when economically practical. In some prototype locations, DLA is taking management responsibility for the extensive service-owned retail stocks, leading to a one level national inventory that will generate great economies of scale and total visibility of all DoD stocks.

- **Distribution cost** has been reduced by eliminating duplication in the distribution depots and optimizing stock positioning worldwide in support of contingency operations. When 500,000 troops deployed for Operation Desert Storm 11 years ago, there was no way to automatically track the more than four million tons of equipment and materiel shipped with them. Finding a single repair part or some component of a units' equipment was nearly impossible across the sea of metal containers. Half of those containers remained unopened until they were shipped back to the United States. In 1997, DLA was tasked with establishing a DoD logistics Automatic Identification Technology (AIT) Office. In its first three years, the AIT office coordinated development of an infrastructure and helped instrument 500 sites in the worldwide AIT backbone. Since 2001, the AIT Office has focused its efforts on automating freight forwarder business processes,

expanding the use of commercial satellite tracking systems, enabling the Common Access Card to manage Joint Warfighter logistics information and adopting uniform, industry-driven data standards across DoD.

- **Customer-focused corporate culture**, a key characteristic of high-performing, world-class organizations, links with the learning and growth quadrants of the Balanced Scorecard. DLA is using the Denison Model to assure high marks. The Denison Model includes four externally and internally-focused traits of corporate culture found to link to bottom-line performance: adaptability, mission, consistency, and involvement. DLA acquired the model and the two diagnostic surveys (organizational culture and leadership development) in time for the May-June 2003 climate survey. Culture champions are being appointed throughout DLA to devise transformation activities to close gaps in the culture between today's baseline and its goal of becoming a truly customer-focused organization.

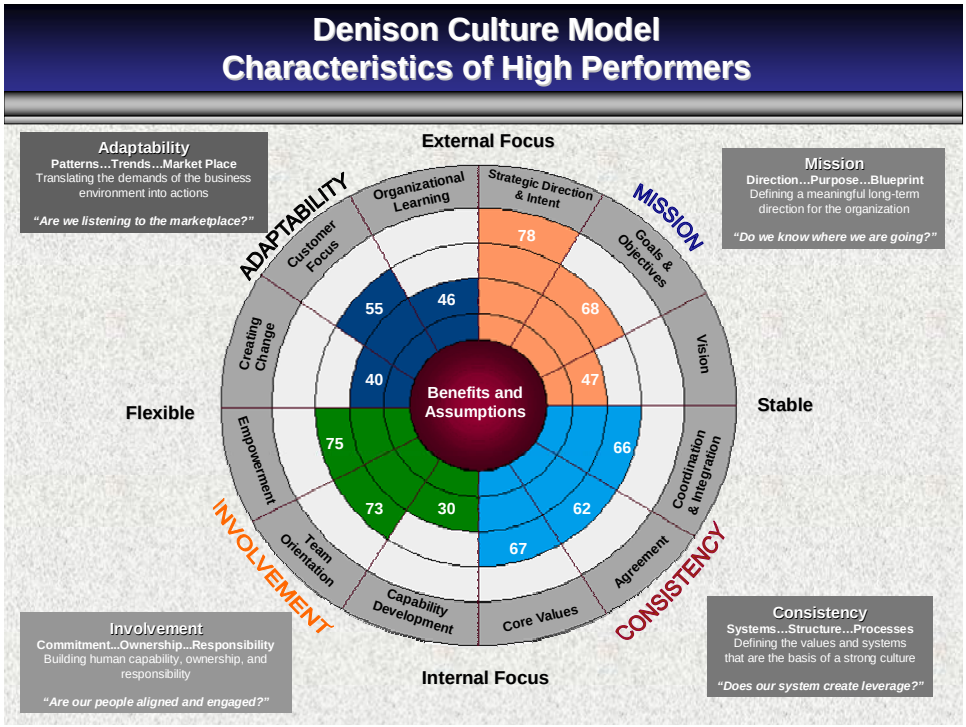


FIGURE II-1: DENISON CULTURE MODEL

- **Competency-based performance management** for DLA's supervisors and managers was effective for over 2,200 civilian supervisory and managerial employees for the rating period that ended Sep.30, 2003. After extensive benchmarking DLA uncovered that top-performing organizations rate management competencies, link performance management to corporate goals and objectives, and reward top performers. The new system will modify the existing three-level system so that each of the nine mandatory management competencies—leadership, teamwork, oral and written communication, strategic

focus, responsibility and accountability, customer service, professionalism, resource stewardship, and innovation and initiative. Elements will be rated as "Exceptional, ","Superior" or "Solid Performance" which comprise the overall rating level of "Fully Successful." In addition, the overall rating levels of "Minimally Acceptable" and "Unacceptable" will continue to remain as viable performance ratings. High performers, (Exceptional and Superior) will be eligible for quality step increases, demonstrating to employees that high performance is rewarded.

- **Communications** is a key component of any change effort and the DLA Customer Relationship Management (CRM) Office provides a consolidated approach to developing and delivering information related to DLA and its business initiatives to DLA customers. Using an IPT network of customer-touch points, public affairs offices and current DLA publications, staff provide strategic level information at headquarters and integrate with what's happening at the field level. The CRM office then develops content and tools to provide the needed message to customers.

- **Value Engineering** strives to improve upon and to make the program a more viable tool to optimize the best values in total ownership cost. DLA's achievement awards for 2002 are examples of the level of effort and organization-wide range of on-going continuous improvement.

B1 – B LANCER

The B1-B Lancer is a long-range strategic bomber designed for low-altitude missions. While the aircraft is older than most of the pilots flying it, it provided excellent performance in Afghanistan and Iraq.

The System Program Office (SPO) is located at Wright-Patterson AFB, OH. The first B1 was built, over a ten year period, to rigid specifications with the government telling the contractor exactly how to do every thing. In the early 1992, the military specifications were cancelled as a result of Acquisition Reform. The new statement of work (SOW) is developed around requirements to build the weapon system to perform to specified parameters. Another major change is viewing the design of the aircraft as a capability not a *platform*; the B1 is a lethal ***capability*** able to target a building or a neighborhood.

The new B1 contract is a sole source to Boeing as the OEM, and the support integrator. The Air Combat Command (ACC) is the customer and identifies all the requirements. The Boeing contract is an Indefinite Delivery, Indefinite Quantity contract. The SPO gets cost estimates for a certain job and time frame. Next they establish cost/schedule objectives for the work and a cost plus award fee incentive. However, cost/schedule objectives are not always adequate for meeting the contract criteria. The B1 SPO‘s goal is to operate in a “relationship” mode of commitment and trust. They try to use a mix of objective (hard-line criteria) and subjective criteria in evaluating the contractor. They continually work to “massage” the relationship based on a mutual agreement to benefit both parties.

Boeing’s decisions are driven by good business rules; making a profit and staying in business are two of those rules. They must satisfy their stakeholders (shareholders) and see no reward to high risk. The AF SPO is the steward of the public’s money. There is a balance of power in the relationship; if Boeing makes the weapon system “unaffordable” then the AF will abandon the B1 and develop other systems.

The SPO does not have the people to write technical data, they manage it. The AF's mission is Fly, Fight and Win. Ten years ago everything was government, today they contract for everything (SAIC, MTC, etc. are support contracts). Today a strong SPO has 100 employees, with 40 contractors doing previously labeled "government" advisory and assistance work. The government people are there to maintain continuity.

The ACC provides over $800 million for upgrades requiring anywhere from 4 months to 4-5 years to complete. Different money (RDT&E, PA, POM) gets assigned to the contract depending on the type of work being performed. Once the user defines the requirement a POM or "program wedge" is put in the budget. They are currently doing the POM for FY06 and will plan for upgrades and funds to accomplish them in 2006.

B1-1 Depot Maintenance

Maintenance is performed at the Oklahoma Air Logistics Center (OALC) at Tinker AFB. In June, 2001, they completed the B-1 *Fly-in Program*; a congressionally mandated, two-year Block D program designed to upgrade the aircraft's global positioning (GPS) and weapons delivery systems during a short timeframe. The modification required the installation or handling of over 37,000 wires and the removal of 200 aircraft components. Each aircraft required an average of 8,500 hours of maintenance.

The OALC work force added a 150 people with avionic, electric, aircraft and sheet metal skills to meet the Fly-In requirement. They established classroom and on-the-job training to meet the modification requirements.

B1 Contractor on Battlefield

Boeing deployed four teams to gun ships to support the B1. The SPO executed a deliver order (time and materials) to buy support hours from Boeing. The airplanes had to be maintained and Boeing had to risk the liability and the safety its employees. The B1 support team was not on the battlefield. Most of the contractors are ex-AF "blue-suitors" as few senior level skilled people are available from other industries. One of the issues the SPO identified was the inability to direct Boeing subcontractors. This was not a performance problem, but it is a new command issues to be addressed.

DCMA is responsible for evaluating the Boeing subcontractors. DCMA waived this year's audit of Boeing's subcontractor proposal, based on the on-going high performance level. (The SPO had no problem with this wavier.) The SPO's level of confidence in Boeing and its subcontractors is based on Boeing's ISO9000 certification and the other supplier certification requirements maintained by Boeing.

The Air Center at Oklahoma City does all of the B1 sustainment maintenance. The B1 SPO Program Manager and the Boeing Program Manager have joint responsibility and work as a team technology insertion or enhancement requirements. They work with the user to find technology available for the amount of money the user will invest. The AF centrally funds some enhancements (GPS) and DARPA funds some with Dual Science and Technology dollars. They split value engineering monies 50/50 with Boeing.

B1-1 SPO lessons learned from their contract experience include 1) be as thrifty as possible, and 2) keep the number of vendors small.

C-5 GALAXY

The first **C-5 Galaxy** inducted into programmed depot maintenance at Robins arrived Jan. 7, 1998. Since then, center workers have completed maintenance on 101 C-5s. The Air Force currently has 126 C-5 aircraft in its inventory -- two C-models, 50 B-models and 74 A-models. (Courtesy of Air Force Materiel Command News Service)

The C-5 depot maintenance team at the Warner Robins Air Logistics Center, Robins Air Force Base, Ga., delivered a center-record of 23 cargo giants back to the warfighter on September 24, 2003. World events are responsible for the increase from 17 aircraft in fiscal 2002 to 23 in 2003.

Since 1992 WR-ALC has used a variety of programs (TQM, Two-Level Maintenance, QP$, Lean Logistics, Re-engineering, Pacer Lean, AREP, DREP, ABC Costing, and CREP) to empower the people and to build a continuous momentum for successful change implementation. Over the years, the W-R Center survived BRAC, won the Installation Excellence award, staffed and resourced a dedicated re-engineering capability (the only one in the AFMC) and won the C-5 work competition.

The Aircraft Repair Enhancement Program (AREP) brought about key changes in planning and scheduling, supply support, backshop support, and production practices that impacted the Depot and the customer. The goals of the AREP lean aircraft sustainment effort are: Work fewer aircraft at one time, 50 percent flow day reduction, 20 percent cost reduction, 10% lower inventory requirements, more aircraft mission ready in the field; less at depot, full supportability for planned work inducted, increase mission readiness and capability, forward look for supportability before the aircraft arrives, and synchronous workflows supporting the aircraft mechanic,

The C-5 maintenance workload left Kelly Air Logistics Center as a result of the 1st major public-private competition under the OPM A-76 requirements. In winning this competition W-RALC became an AF contractor to provide depot maintenance for the C-5. The enormous size of the C-5 eliminated many repair sources from the competition. Having the needed size of hangers and equipment required to perform made W-RALC a logical choice for the C-5 contract. But winning the contract was a result of employees and leaders buy-in to the need for change and the establishment of a re-engineering mentality that inspired the new vision, Center of Choice and Employer of Choice and resulted in the reduction of programmed aircraft maintenance flowdays by 40%.

The initiative to introduce Lean Logistics was included in the foundation for what is today called DREP. Lean Logistics initiatives strive to provide quality products, in the right place, at the right time, at the right price –with the least requirement for inventory. Loosely translated for the customer, this means always finding a plane in supply when needed. Lean Logistics represents a fundamental rethinking of how the ALC achieves that goal. The key is speed and lower inventories of work in process.

The traditional approach to satisfying the field need was to maintain large inventories in work at depot as well as in warehouses. However, large inventories are expensive; when the item is no longer needed, large inventories become losses as they go to disposal. Lean Logistics replaces inventory size with inventory speed. From the source of supply, through the depot repair processes, along the lines of transportation, and into the customers' hands, the faster the inventory moves, the fewer items needed. In AREP, the re-engineers discovered that reducing the number of aircraft in work at depot by 50 percent could double the speed in which W-RALC could deliver an aircraft, even while maintaining the same number of workers. [32]

The purpose of the Contract Repair Enhancement Program (CREP) is to create roles, responsibilities, and partnerships between contract repair private vendors and the WR-ALC. The team prioritizes contracts by dollar value and operational needs in order to understand the current contract repair process, identifying inconsistencies, bottlenecks, and areas of improvement for the re-engineering team to focus on. The goal of the program is to export lessons learned to help the private sector.

C-17 GLOBEMASTER

The **C-17 Globemaster III** is the newest, most flexible cargo aircraft to enter the airlift force. The C-17 is capable of rapid strategic delivery of troops and all types of cargo to main operating bases or directly to forward bases in the deployment area. The aircraft is also capable of performing tactical airlift and airdrop missions when required. The inherent flexibility and performance of the C-17 force improve the ability of the total airlift system to fulfill the worldwide air mobility requirements of the United States.

- The initial contracting activity on the C-17 was an alpha contracting to "down select" to the number of contractors interested in doing the work. After the alpha contracting, everyone goes into a teaming arrangement where they work together to determine projected cost, hours, models, etc.
- Under Total System Support Responsibility (TSSR) the prime contractor, Boeing, is responsible for the following system support functions: program management, asset repair, depot level maintenance, technical orders, support equipment, supply management, sustaining engineering, and engine management. Service Level Agreements are not planned for the C-17. Depot maintenance services from organic sources will be obtained by the prime contractor using Direct Sales Agreements.

- Partnerships for depot level maintenance services outside of core will be established on a best value basis. Other logistical support functions for the C-17 are not subject to partnerships because of the TSSR contract. The prime contractor has the flexibility to seek sources of supply and/or manufacturing in the public or private sectors.

- Organic support comprises only those depot maintenance workloads determined to be core. Core is defined as the level of organic workload necessary to ensure sufficient wartime facility, equipment and skills capability exists to satisfy readiness

requirements. Current estimates of core show that it comprises about one third of the overall depot maintenance workload projected for C-17. For the other logistical functions, organic sources (such as inventory control points and commodity managers) already exist for government furnished equipment and materiel used by the C-17 program. The prime contractor will be responsible to coordinate support requirements with these organic activities.

- Prime contractor performance is assessed based upon the following metrics:
    - Depot Scheduling
    - Flying Hours Achievable
    - Parts Issue Effectiveness
    - Mission Capable (MICAP) Parts Management
    - Customer Satisfaction
- Formal reviews occur on a weekly basis at the program manager level. The prime contractor is represented at all operational locations, as well as at the program office. Program issues are worked continuously as required.
- 90% of the metrics are quantitative, objectives measures. At each award fee period, they set new goals for each quarter. Customer satisfaction is measured. The first survey is sent to aircraft users 120 days after delivery of the new aircraft on base – initial inspection. In 90 days – they send another survey to check the customer's perception the second time.
- Customer surveys are completed with each award fee period. (Can get "poor behavior" from an award fee, for example, contractor buys a big number of supplies to score high a specific metric for the award fee.)
- The award fee goal is level of service with a minimum threshold, between the minimum and the goal is considered *acceptable* level of service. The contractor can only earn more (award fee) only if they exceed the *acceptable* level of service goal.
- C-17 will soon be able to go to a firm – fixed price contract since they have collected historical "should cost" data jointly with Boeing.
- Post award activities are coordinated by the program office in coordination with the DCMA on-site presence. Management reviews are scheduled on a regular basis to assess performance. Contractor reporting has been implemented to facilitate performance assessment in cost, schedule and support effectiveness.
- Performance to date has met or exceeded program office and user expectations.

- Electronic Data is available to contractor and government using a combination of contractor developed and existing government data systems. The user has access to the appropriate data systems as well as to contractor on site representatives.

- A combination of sources is used to fund C-17 contractual efforts. Currently, the program uses funds in the aircraft procurement appropriation, O&M appropriation, and working capital funds.

- Each Boeing Customer Contact Person (CCP) develops a "Customer Contact Plan" and keeps current a "Customer Profile" for each government POC. The Customer Profile covers the basic information about the customer (government). It can be used as a standardized checklist when first meeting a new customer to ensure that all the appropriate information is know and recorded for future use. It is a reference for the Alternate CCP and supervisor to use during a Primary CCP's absence or when training a new CCP. (Both documents are available in Appendix III, Study Charts and Tables.)

- The Customer Contact Plan describes a CCP's assigned customer interface. Included in the plan are the customer's principal interests, most important values, and desired frequency of contact and areas of related interest in which the customer is expecting to be kept informed. Contact frequency may vary widely depending on the role the customer plays, individual customer preferences and the nature of the customer interaction activity. The customer contact plan formally documents how customer interaction is to be implemented.

COMANCHE RAH-66

RAH-66 integrates battlefield sensors, shooters, and the tactical command and control system. The Comanche's tactical role is both offense and defense acquiring and distributing target information and battlefield intelligence to joint services intelligence, maneuver, and fire support elements, including armor, artillery, infantry aviation, and USAF and Navy strike systems, and applying combat power to ensure operations achieve intended results with minimum/no U.S. or Allied casualties.

The Project Manager for the Army's next-generation light-attack/army reconnaissance helicopter is at Redstone Arsenal, AL. The Boeing Sikorsky Comanche team relocated from Huntsville to Bridgeport, Conn., to be near the Comanche production facility, in the summer of 2002. The program successfully completed the Milestone II Defense Acquisition Board review in March/April 2000. The Comanche is slated for fielding in 2009.

Numerous studies including three Cost and Operational Effectiveness Analyses (COEAs) and two Analysis Of Alternatives (AOAs) have come to the conclusion that the RAH-66 is the most cost-effective weapons system for armed reconnaissance and attack. Comanche is expected to provide a significant improvement in operational effectiveness with a 40% reduction in Operating and Support Cost versus the current Army attack helicopter fleet. Plans for its sustainment are being made to incorporate all of the taskers associated with logistics transformation: minimize logistics footprint, reduce infrastructure with respect to inventory, and establish best value.

Along with its unique warfighting capabilities, the RAH-66 is designed for support. Its quick Rearm and Refuel turnaround of 20 minutes, and with only three soldiers. When compared to legacy helicopter systems, the Comanche has enhanced support attributes:

- Minimal Logistics Footprint
    - Fewer parts
    - Reduction in maintenance equipment
    - Extended time between maintenance actions
- Simplified Maintenance
    - Unique "remove and replace" 2-level maintenance design
    - Only 4 Military Occupational Specialties
    - Improved integrated component diagnostics
    - Improved access (50% of skin is access panels)
    - Electronic maintenance computer
- Briefcase-size tool kit (49 tools)
- Embedded training

Performance Based Logistics (PBL) metrics are also being incorporated into planned sustainment contracts: System Operational Readiness Rate of 90% peacetime and 78% wartime; Average monthly Non Mission Capable-Supply (NMCS) at or below 10%, a Management information systems operational 23-hours/day with current data. Additional metrics address reliability and configuration management response.

The PM benchmarked product support strategies with Southwest Airlines, FedEx and several Navy and Air Force aviation programs.

Under the planned product support integrator (PSI) concept, a PSI *Management Team (PSIMT)* will support the PSI. The PSIMT (1-800-COMANCHE) will have a Warehouse Specialist, Supply Chain Management (SCM) Specialist, IT Specialist, Budgeting and Contracting Maintenance Specialist and administration support. It envisions that supply support inventory, distribution and transportation management, will be competitive and can be subcontracted to a third-party logistics provider (3PL) or a partnership between the OEM and a logistics firm. In the current plan the OEM will maintain responsibility for technical data, PDSS, CTR and technical publications.

JOINT SURVEILLANCE TARGET ATTACK RADAR SYSTEM (JSTARS)

The **E-8C Joint Surveillance Target Attack Radar System** (Joint STARS) is an airborne battle management, command and control, intelligence, surveillance and reconnaissance platform. Its primary mission is to provide theater ground and air commanders with ground surveillance to support attack operations and targeting that contributes to the delay, disruption and destruction of enemy forces.

Joint STARS evolved from Army and Air Force programs to develop, detect, locate and attack enemy armor at ranges beyond the forward area of troops. The first two developmental aircraft deployed in 1991 to Operation Desert Storm. The joint program accurately tracked mobile Iraqi forces, including tanks and Scud missiles. Crews flew developmental aircraft on 49 combat sorties, more than 500 combat hours with a 100 percent mission-effectiveness rate.

Northrop Grumman Corporation (NGS) is the prime contractor for the sole-source TSSR contract. The WR-ALC depot performs core depot maintenance work under a workshare partnership with NGC. The NGS determines the depot's work requirements and provides sustaining engineering and other support functions to the depot to facilitate the accomplishment of the work.

The Long Range Memorandum of Agreement (LRMOA) is between all partners—the JSTARS Joint Program Office, NGC, and the WR-ALC depot. The LRMOA provides the overarching goals and objectives of each of the parties and documents the top-level commitments to negotiate subsequent agreements in concert with these goals and objectives. The LRMOA is reviewed and updated semi-annually.

The Partnering Agreement (PA) between NGC and the WR-ALC provides the general terms and conditions by which all depot-performed workloads will be accomplished and outlines the general responsibilities of the parties for performance of the workloads. Specific legal issues (e.g., dispute resolution, warranties, assignments, legal remedies,

funding processes, etc.) are addressed by the PA. The PA is incorporated into the prime TSSR contract as the guiding basis for the Air Force providing the depot-performed workloads to the contractor.

NGC is in general control of the funding, although funds are actually transferred from the government buying activity to the depot.

The Implementation Agreements (IAs) are between NGC and the WR-ALC. The IAs are structured similar to a contract order, containing line item pricing, work descriptions, delivery times, Statements of Work, and other information and commitments pertinent to each specific workload. IAs also includes budgetary dollar estimates for the following 5 years of requirements.

Overall the performance of the contractor is considered highly satisfactory. Multiple layers of metrics are reviewed, a few are as follows:

- The availability rate of the mission crew trainers averaged 98% for the fiscal year. The standard is 95%. This resulted in 50 additional training positions at no additional cost.

- The number of organic software changes included in the JSTARS baseline increased from 20 in FY01 to 171 in FY02.

- FY-01 and FY-02 Program Savings of $30.8M

- Flew 100% of Scheduled Missions in Support of Operation Enduring Freedom (249)

In general the metrics support performance and affordability. Under the award fee, technical performance is 36% and Customer Satisfaction is 29%. Affordability metrics include cost performance for 35% of the award fee, and 34% of the award term is cost.

The Contract is an integrated award fee/award term strategy with a long-term potential of 22 years. Additional terms are awarded based on the total number of performance points NGC earns each quarter. Accrual of 100 positive points increases the term by one year. Accrual of negative points reduces earned term by one year. Each year there is a potential -100 to +150 points available.

WISCRS is the software program used to track performance.

TOW IMPROVED TARGET ACQUISITION SYSTEM (ITAS)

Tow Improved Target Acquisition System (ITAS) provides world-class surveillance and anti-armor capability.

In the words of MG David H. Petraeus, Commander, 101st Airborne Division:

"The FLOR and the TOW ITAS, in particular, was the hero of the battlefield. It enabled us to see the enemy way, way out before he could even believe we could see him. And that night outside the airfield, for example, our TOW gunners could see the enemy and bring in either close air support or artillery before the enemy even realized he was being seen." (Roadshow briefing)

The ITAS briefing, during the PBL Roadshow in Huntsville on 18 August 2003, covered information related to the PBL study.

- ITAS designed to improve performance; and better performance equals more kills and greater soldier survivability.
- There is no change in the soldier's direct support mission; they trouble shoot and repair system, with repair by replacement spares loaded as shop stock.
- Inventory management is the contractor's responsibility. They provision, own, and maintain an inventory of spares; determine requirements and capture demand history.
- The soldier uses standard Army information systems (SARSS) to interface with the contractor. There is no direct cost to the soldier; initial spares, replenishment and transportation to and from the depot are all provided as part of the contract.
- Depot maintenance repair is also provided under contract with Raytheon at McKinney, Texas
- During mobilization, the contractor's Forward Repair Activity (FRA) is collocated with Army Support Battalions to provide limited depot level repair.

They are on the unit's load plan, on two hour recall, with shots, wills, and personal equipment ready to deploy on Commander's call. They are not required to be on the battlefield.

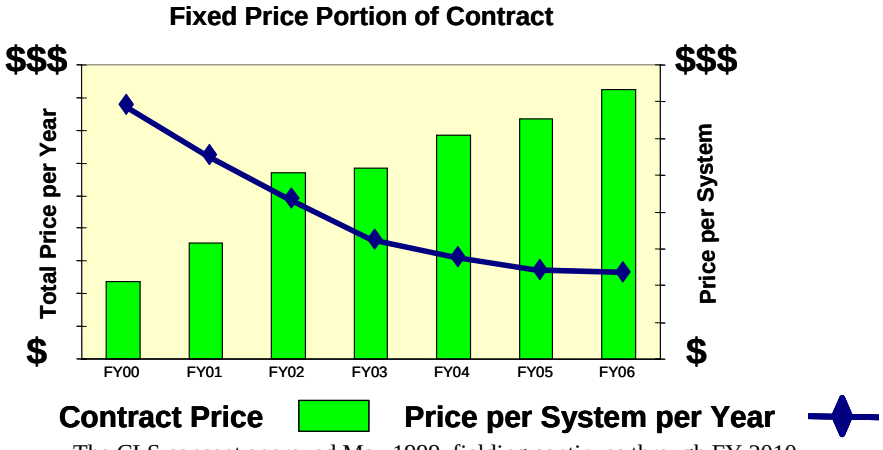
- Since this is a new, low-density weapon system, with relatively low funding requirements, it is not integrated into the AWCF.

The 5-multiple year contract performance requirement is 90 percent system operational readiness level. Higher performance levels result in greater profit with an adjustable award fee. The price of the contract is increasing each year due to the increase in the number of systems being fielded. The price per system is decreasing per year.

ITAS Logistics Support: Contractor (CLS) / Organic Cost Comparison						
	FY 2001	*FY 2002*	*FY 2003*	*FY 2004*	*FY 2005*	*Total FY 99- TC*
CLS (TY$)	7.7	10.8	13.5	12.9	16.0	601.1
Organic (TY $)	18.2	27.4	18.2	21.9	29.0	944.6
Cost Avoidance	10.5	16.6	4.7	8.9	13.1	343.5
CLS Cost Avoidance Major Contributors: No TDP, Replenishment Spares, Initial Spares						

TABLE II-1: ITAS LOGISTICS SUPPORT

The PBL contract (FY 02 – 06) has several metrics in place to maintain contractor performance: Any one system down more than 30 days reduces maximum award fee by 50%; three battalions at less than 90% (during award fee period) eliminates any award fee. If a division is at less than 90% for a month there is no award fee and the contractor is required to increase inventory by the number of unfilled requisitions that month.



The CLS concept approved May 1999, fielding continues through FY 2010.

FIGURE II-2: FIXED PRICE PORTION OF CONTRACT

F/A-18 E/F USN/INDUSTRY PARTNERSHIP

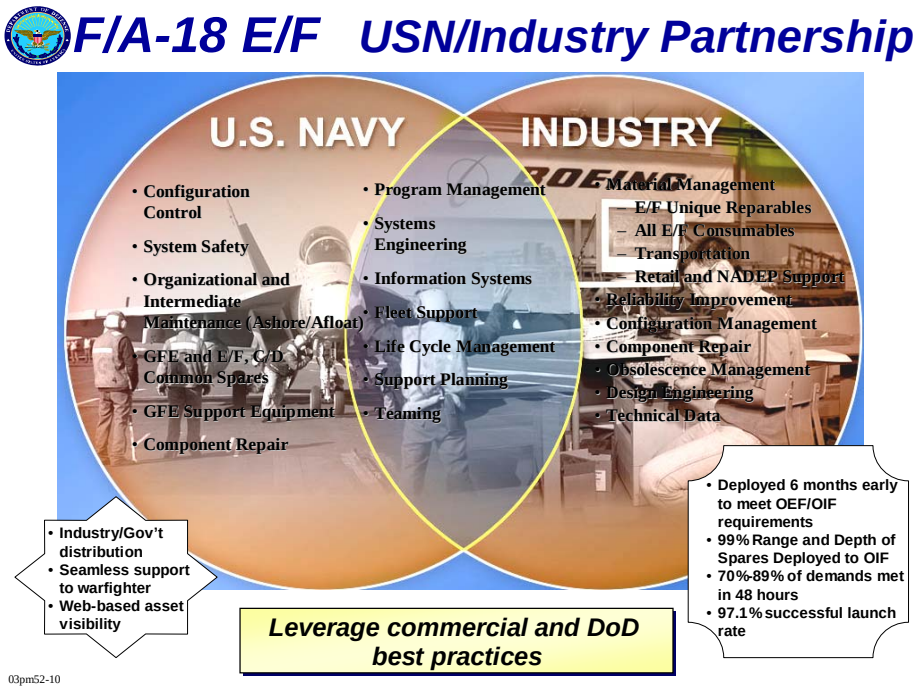


FIGURE II-3: F/A-18 E/F USN/INDUSTRY PARTNERSHIP

The NAVY uses a PBL approach for sustainment of F/A-18E/F unique items, with the potential to evolve to an OEM sustainment integrator under a NAVAIR contract.

The TSSR-like structure contract provides tip to tail components for the E/F unique items. Boeing is the overall system integrator. The contract is managed by NAVICP, Philadelphia. It is a two-year base term contract with plans to evolve to a fixed price. It is currently an IDIQ cost plus, inventive fee/award fee contract

Metric include the following:

- Material Availability
- Supply response time – 85% within LMMIPS
- Stock effectiveness – 90%
- Fleet Support – RFI within 8 hours
- Sustainability – Reliability subjectively measured
- IT Connectivity

Award fees up to 11% of the contract value are possible:

Incentive Fee is 33% and measures cost performance

Award Fee is 67% and measures technical performance

Partnering Arrangements include:

- Commercial Service Agreement between Boeing and 3 Navy Depots
- Joint Government/Industry Team determined best value repair points—commercial or organic
- A business case was build to support the partnerships and documentation is currently maintained for all decisions.

NWCF are used for the contract. The initial plan was to fund the contract with a single "line of accounting" however a shortage of flying hour program (FHP) monies required the NWCF arrangement.

NAVICP buys performance and sells flying hour support. FLP funds individual components to reimburse NWCF

The single-seat F/A-18 *Hornet* is the nation's first strike-fighter. *Hornets* are currently operating in 37 tactical squadrons from air stations world-wide, and from 10 aircraft carriers. The U.S. Navy's Blue Angels Flight Demonstration Squadron proudly flies them. The *Hornet* comprises the aviation strike force for seven foreign customers including Canada, Australia, Finland, Kuwait, Malaysia, Spain and Switzerland.

APPENDIX III:

Best Practices From Industry

LESSONS FROM THE PRIVATE INDUSTRY

The term *Performance Based Logistics* (PBL) is not used in the private sector. This could be because of the nature of private business. Since they are driven by producing value to its stakeholders, they may be guided by the principles of enhancing the performance of their logistics and related functions. In fact, the recent movement of *Supply Chain Management* (SCM) and the emergence of integrated logistics and supply chain systems support this viewpoint. Further, the term *logistics* in industry is rather limited as compared to its use in the Department of Defense (DoD). Therefore, in asking our questions about the nature of logistics function in private industry, we widened the scope of logistics in the private sector to include inventory management, spare parts acquisitions, repairs and maintenance activities.

In researching the logistic practices in the private sector, we wished to identify those firms that have similar issues as those found in the DoD in general and AMCOM in particular. While there are several similarities in the logistics networks of the private sector and the DoD services, there are numerous differences as well. Similarities include the need to meet tight deadlines, deal with uncertainties of various kinds, and the desire to reduce costs while maximizing system availability. Differences include the size of the operation, the severity of the wrong decisions, and the need to concentrate excellent performance in times of crisis (like the wartime military operations). With these similarities and differences in mind, we selected those business firms which could provide some guidelines to be used in the DoD and AMCOM's PBL initiatives. All selected firms have business operations at multiple locations, mostly globally located. The transportation function is also an important aspect of their business. Customer satisfaction is a serious concern and the goal of these firms. These characteristics compare quite well to the operation of the logistics function at AMCOM. The ultimate performance of the system by a warfighter is of utmost importance to DoD because it may be necessary at any time and any place in the world.

Major Findings

Our major findings from the literature and discussions with various industry leaders indicate that the private firms manage their logistics and related functions in an integrated manner. The major findings from the industry are the following:

1. ***Provide a single contact point for all logistical support***: The literature on logistics and supply chain management suggests that the firms can gain maximum advantage of the synergies between various business functions and partners if there is a single unit of the firm that deals with the entire logistics function. This was corroborated by the industry leaders of the firms in our investigations. Each business leader emphasized the need to provide a single point of contact for all logistical support. Thus, while the individual units of the firm (like various product managers) identify their logistical requirements and the alternatives to meat those requirements, all logistical contracts and operations finally are

managed through the logistics support unit of the firm. Even those firms that have established their own subsidiaries who do business as third party logistics providers, have a single point of contact for logistical support of their in-house logistical needs. Providing a single point of contact for all logistical support also helps to gain knowledge from one specific contract to the next and acts as a knowledge creation, sharing, and management activity. This enables a firm to leverage its resources to improve effectiveness and efficiency at the same time. In fact, business executives stated that they rely heavily on the people who are in charge of these integrative logistics units of their firms.

2. ***One size does not fill all; customization is necessary***: While providing a single point of contact is important, one size of one approach does not fit all situations. In fact, each logistic activity has its own peculiarities and hence requires customization to meet specific requirements. Therefore, requirements for each product manager needs to be analyzed as a customized activity and managed as such. This would require the creation of the knowledge base and the creation of an interdisciplinary taskforce to be able to develop the best way to meet the logistical requirements of the product manager.

3. ***Partner with the Contractor on Logistics System Design and Operation***: Whenever and wherever a private firm uses a contractor to provide and/or manage their logistics function, the design and operation of the logistics system design is a shared activity done in partnership. Each party has an interest in the outcome of the system and its operation. Therefore, long-term partnerships are necessary which are built on mutual interests, trust, and respect for the capabilities of the partners. The single point of contact for the logistics support function in the industry coordinates and manages this partnership.

4. ***Emphasize Defining and Clarifying Performance Metrics***: A business firm always identifies the performance levels required to meet its business goals. Therefore, in their design and operation of the logistics systems, they spend considerable time and effort in translating the business goals and performance levels to key performance metrics. These metrics should be easily understood and quantified. However, their definitions also require that the firm be clear about its performance levels. For example, if a firm states that a failed system should be brought back to operation within 24 hours; there should an analysis that supports the adoption of such performance level.

5. ***Provide both a penalty and incentive clause in contracts***: In our discussions with industry leaders, it became clear that they reward excellent performance while at the same time are willing to penalize them for the lack of meeting the standards of performance. However, the penalties and incentives need to worked out carefully and must be based on an analytical framework. The standards set for the performance levels must be achievable and contractors must have some motivation to develop technologies, systems, and procedures to exceed those standards.

6. ***Keep In-house Core Competencies in Logistics Support***: Industry leaders emphasized the need to keep core competencies in-house even though they may deal with third party logistics providers. This is essential to insure that the single point of contact used does in fact have the knowledge and expertise to deal with the contractor. Further, the firm must be able to perform various analytical tasks required to ensure that the best logistics systems are designed and operated.

7. ***Develop and Use Appropriate Information Systems***: In discussing the logistics support practices, it became clear that the private sector firms leverage the use of information technology through the development and use of appropriate and integrated information systems. These systems link various partners in the supply chain and can be used for planning and control on one hand, and monitoring and measurements on the other. In fact, many industry leaders believe that an extensive use of information technology, specifically internet based information systems, is a must for successful logistics function in industry.

BRIEF SYNOPSIS OF INDUSTRY DISCUSSIONS

AutoZone

This business represents over 3,200 stores selling various auto parts with a sale of over $5.5 million dollars. Their parts are moved through eight distribution centers with seven of them operated in-house while one of them is run by a contractor. Transportation is through private contracts. They deal with more than 22,000 stock keeping units (SKUs) and have over 3,600 deliveries a week. In their operation, the basic performance metric is the percentage of items delivered on time. Distribution centers (including the contractor) are penalized for not meeting the standard set of the delivery time and given an incentive to enhance the percentage of the items delivered on time. Each ordering by a store requires centralized authorization. AutoZone does not believe in *Vendor Managed Inventory* (VMI). The Vice-President of Supply Chain and Information Technology (who heads by all logistics support activities) stated that in order to keep their costs down and their operations effective, they need to manage their inventories and logistics in-house. However, he also said that he would not mind the inventories being vendor owned if that was possible. Repairs are managed through vendor relationships.

The success of AutoZone's logistics system is largely due to the design and use of an integrated information system. Therefore, the Information Technology (IT) function is critical to their success. Through the use of their IT function, they also leverage on their knowledge transfer capabilities and use it to make their future operations successful.

The financial aspects of AutoZone's logistics represent a pass through type of cost structure where the total cost of such activities is charged backed to the local retail stores. However, this charge back system is based on the percentage of the total sales and not on the specific logistical activity of the store. Therefore, even though one retail store may use more assistance from the Logistics and Supply Chain Department, its chargeback cost will not be different from that of another local retail store which has the same level of

sales but did not use the services of the Logistics and Supply Chain Department. However, individual differences in the use of the centralized services at AutoZone are not likely to be significant.

UPS (and its Supply Chain Solutions)

UPS is a $30 billion package delivery company and a leading global provider of specialized transportation and logistics services, combining the flows of goods, information, and funds. UPS strongly encourages that a centralized warehouse be used in conjunction with the supply chain network that they currently have in place. The performance metrics are developed by the UPS in-house, often through the use of their Supply Chain Solutions Network, and implemented based on the characteristics of the client who uses the network. Whenever UPS Supply Chain Solutions serves an outside client, the logistics requirements are identified in partnership with the client. The partnership develops a base procedure for communication and delivery of products. A long-term partnership is established up front to increase the switching costs between the two companies. Each portion of the supply chain is examined on a continuous basis to ensure that its part is effectively accomplished. The UPS Supply Chain Solutions works with the client to develop key performance metrics which includes on-time delivery, improved customer service, and dealer satisfaction. Whenever they deal with a client for repair services, they promise a turnaround time of 24-48 hours. They serve as a single point of contact for a client's logistics support needs and work on a cost plus gain sharing scheme. They help the clients integrate their fragmented operations and deploy information technology to reduce costs and increase effectiveness of the logistics and repair functions. They provide multi-client campus where they can serve various customers through the knowledge gained from multiple parties. Penalty for them is a loss of contract. Performance is based on tracking systems operated by UPS Supply Chain Solutions and the client.

Target (and its Distribution Centers)

Target Corporation is a growth company focused exclusively on general merchandise retailing. With 1,107 stores in 47 states, Target's principal strategy is to provide value to American consumers through multiple retail formats ranging from upscale discount and moderate-priced, to full-scale department stores. Target's best practices include the centralized decision making, reduction in carriers, and electronic interface between each level of the supply chain. Contractors for Target usually have 2-3 year contracts that serve as a performance motivator for all service providers including those who have been providing services to Target for several years. The decision for the contracts are based on the history performance of the supplier, history of products needed, and are centrally made. Target looks for a 99% success rate in meeting its delivery times and employs a three strikes rule for each supplier. Failures are punished by reduction of payment amount stated in the contract. The only identified incentive for completion of the requirement is to receive full payment. The transportation accommodations are made centrally. Target uses twenty-two distribution centers; each one (excluding one which uses private trucking) uses third party delivery of products. The communication for

delivery times and amounts are handled electronically. The electronic data interchange (EDI) between each level is done automatically. Target's cycle time for putting products at the low level using the EDI system has been reduced to seventy-two hours, which also can be done in thirty-six hours in emergency cases.

Caterpillar

A Fortune 100 company, Caterpillar is the world's leading manufacturer of construction and mining equipment, diesel and natural gas engines and industrial gas turbines. With 2002 sales and revenues of $20.15 billion and more than half of all sales to customers outside of the United States, Caterpillar maintains a position as a global supplier and leading U.S. exporter..

CAT Logistics Services, with more than 95 facilities and operations in 25 countries on 6 continents, serves clients in over a dozen distinct industries from automotive, aerospace, and manufacturing to technology, industrial products, and consumer durables.

CAT Logistics provides Total Logistics Services for the Navy as a result of poor operational readiness. Government depot level repair facilities were unable to meet demand due to lack of available repair parts.

They established a team with Honeywell for configuration management and reliability improvements, and with Cat Logistics for IT, inventory management, transportation, and warehousing.

Results:

	Pre Cat Logistics	**Dec '02**
Back Orders	123	33
On-Time Depot Return	50%	59%
Availability	65%	95%
Transit Time	20%	95%
Picking Accuracy	92%	100%
Mission Readiness	12%	91%
Changes in Business Situation	Multiple Handoffs Stockpiled Inventory Slow Supply Chain Inaccurate Data =No Visibility	Supply Chain Efficiency Asset Availability Accountability Fixed Cost =Customer Focused
	Complex, unresponsive	**Single Point-of-Contact**

TABLE III-1: CAT LOGISTICS RESULTS

Adtran

ADTRAN, Inc. is a telecom equipment supplier, with a 17-year history of profitability and a portfolio of more than 1,000 solutions for use in the last mile of today's telecommunications networks. ADTRAN solutions enable voice, data, video, and Internet communications across copper, fiber, and wireless network infrastructures. and are currently in use by every major domestic service provider and many international ones, as well as by thousands of public, private and government organizations worldwide.

Adtran runs its logistics system through its logistics and transportation department. They maintain distributed warehouses (rented space) which are completely outsourced for the spare parts so that short-term needs of the clients are met easily and rapidly. Most work is done in-house except for the use of outside transportation function. ADTRAN is not does their own planning and control of all logistical functions. They are integrating their supply chain with the vendors and use timely delivery and maintaining the quality levels as performance metrics. They are currently implementing a Transporation Management Systems with links to their ERP system.

Sanmina-SCI

Sanmina-SCI Corporation is an Electronics Contract Manufacturer (EMS) serving the fastest growing segments of the $125 billion global EMS market. The Company provides end-to-end manufacturing solutions to large OEMs (Original Equipment Manufacturers) primarily in the automotive, communications, computing, defense and aerospace, industrial and semiconductor systems, medical systems, and multimedia markets. They links information systems with the information systems of their clients. This includes the repair services for some clients. In doing so, the VP of Supply Chain for Sanmina-SCI works with the clients to identify their needs.

Dell

In supply chain circles Dell is often viewed as the star of supply chain management. Dell Computer Corp. uses a build-to-order manufacturing program to hold down its inventory to a five-day supply, while shipping 95 percent of customer orders within eight hours.

Dell uses i2 Technologies software to track its supply chain activities. This supply chain management software enables Dell to monitor the system constantly, enabling it to make changes within hours to respond to fluctuations in consumer demand. The software also alerts Dell to any supply shortages. Dell’s planning process is linked to its business forecasting process, and takes place on a weekly basis, drawing from a 13-week rolling forecast that is issued each week. This 13-week forecast is developed using sales data gathered from Dell’s sales force, whose performance is measured by the accuracy of such forecasts.

Factory Production Workflow

The i2 Technologies have enabled Dell to expand its scope of Web-enabled information available to factories and suppliers. Not unlike the defense industry, Dell faced obstacles such as constrained timelines, limited resources, and investments in legacy systems with established interface requirements.

Independently owned and operated Supply Logistics Centers (SLCs) or hubs deliver materials to factories. An SLC coordinates the delivery of components to maintain a timely (within 90 minutes), damage-free, and controlled flow of supplies to the assembly line. SLCs help improve efficiency and reduce inventory, but also introduce planning challenges. An SLC can service multiple factories; each factory makes materials requests independently of the others. For planning purposes, each factory assumes an unlimited supply at the SLC in making materials requests. This procedure allows each SLC to track materials availability, determine which requests it can and cannot meet, and commit (or refuse) to deliver the requested materials.[33]

Repairs

Dell implemented Americas Service Delivery (ASD) division to draw upon an extensive network of suppliers and repair facilities to process, repair, replace, and ship computer parts and systems that have been returned by customers. Consisting of more than 150 vendors, 30,000 field technicians worldwide, and 3,600 technical support personnel, Dell's global reverse logistics network involves a complex exchange of millions of spare parts between supply chain participants..

After evaluating ten vendors, Dell selected WorldChain as the best suited to automate logistics and parts management activities for Dell's complex service network. WorldChain successfully deployed the reverse logistics solution in 97 calendar days, delivering over 90% of the full benefits within a month of "go-live." To date, the WorldChain solution has far exceeded the initial objectives of the project:

University of Toronto

The University of Toronto's purchasing department embarked on an e-procurement journey to improve its procurement process by reducing transaction and delivery times.

An internal survey revealed that highly skilled researcher assistants spent nearly 40% of their time performing procurement-related tasks. Similarly, 30% of budgeting and financial management officers' time is taken up by such activities. Consequently, the university had to look for ways to drive down process costs and improve productivity by allowing researchers to focus more time and dollars on their research and teaching. The university's procurement department decided that their primary drivers should be developing a solution that enabled researchers to do more research and their support staffs to more effectively support that research. Part of this goal is achieved through addressing supplier relationship management.

The University of Toronto eProcurement Process

At the start of a shopping process the user is presented with a familiar web interface. With a single authentication the user has access to all of the suppliers in the portal, each of which presents the user with U of T contracted pricing and the suppliers' lead times. The 'back-end' system routes electronic shopping 'carts' to predefined approval authorities and verifies that the research accounts have the funds available to commit the purchase. Once these checkpoints are passed, the SAP system transmits purchase orders to the suppliers' ERP systems where orders are queued for fulfillment. When the goods are shipped, the supplier transmits an electronic invoice where it is parked in the university financial system. When the goods arrive the end-user acknowledges receipt in the system, a process analogous to checking a packing slip. The system queues the invoice for payment via electronic funds transfer and completes the purchase cycle.

Benefits

The University of Toronto has significantly simplified the process for the researchers. Shopping is reduced to 'point-and-click.' They no longer need to be concerned with budget over-runs, applying the correct sales tax or getting the contracted price. For financial managers, detailed, real-time information, elimination of budget risk, and clear audit trail brings to an end the paper chase and shuffling funds between accounts to cover over-drafts. 120,000 annual transactions that once took 27 steps and 3.46 hours each are now reduced to only 7 steps and less than 20 minutes. Not to mention cost savings of $117 +/- $35 per transaction.

This new solution presented the university's supply partners with increased market share and reduced cost of doing business-- two important factors in driving down product costs for end-users. The eProcurement environment also enables suppliers to get closer to the consumer, facilitating communication and collaboration.[34]

Royal Caribbean Cruises Ltd.

RCCL's procurement and logistics processes together spend in excess of $600 million of the company's $2.9 billion in total revenue.

Each ship is a complex, self-contained piece of machinery with unusual gear suitable for a harsh environment. Each ship carries anywhere from 4000 to 5000 people for 7 to 10 days at a time. European manufacturers build approximately 98% of the RCCL's ships. Ships' engines run 24 hours a day, 7 days a week, 365 days a year. Consumables such as nuts, bolts, chlorine, and commodities in general are often purchased at the port where the ship docks. This is made possible through global agreements formed with companies that can deliver to ports where RCCL operates. Ships send their requirements to the RCCL office in Miami, who then relay requirements to a vendor who will deliver at the ship's next port. The ships' databases are not connected with shore on a real-time basis, but are synchronized once per day.

Much of the vessels' spare parts, mechanical and electrical supplies are stocked onboard the ship. Engineers are available onboard and at shore side to perform repair and maintenance as needed. RCCL uses two main channels to acquire spare parts. For cost reasons RCCL uses the OEMs as much as possible.

Lead times are normally very long. In order to reduce lead times when possible, RCCL has visibility across the fleet to identify spare parts on one ship that could be transferred to another to fulfill a need. RCCL uses commercial third party logistics carriers to buy spaces on specified routes on weekly and monthly basis. RCCL is currently evaluating the military's depot concept for storing bulk and critical components.

RCCL's supply can be divided into two distinct supply chains, each managed by a Provision Master. The first supply chain includes the purchase of all food, beverage, and lodging inventories. Before each cruise, the Provision Master for this supply chain is required to create a list of materials needed for the cruise (and sometimes for a few upcoming cruises) and to allocate the inventory to various cost centers on the ship.

The Provision Master takes into account previous trip experiences, the season, and the current customer base—U.S.-based, European, or, in some cases, the number of children as passengers. When the list is finalized, it is transmitted to RCCL's procurement department to send purchase requisitions to vendors via electronic data interchange (EDI), fax, or e-mail.

The second supply chain is managed by a Provision Master, who is responsible for procurement of "corporate spend" materials, such as office supplies, printed materials, printing services, computer supplies, hardware, and software; and marine consumables (spare parts, fuel, lubricants—any and all services associated with ship maintenance).

Each of its 22 ships turns out every weekend in different ports, each with a unique travel itinerary. Each vessel must receive all materials needed for a seven-day trip within an eight-hour window prior to departure.

In order to avoid high transportation costs, RCCL elected to institute a c-commerce (collaborative commerce) to work closely with suppliers to effectively plan for the deliveries of truckload quantities of materials to key strategic locations. This required RCCL to provide more guidance and more timely information about inventory positions, itinerary changes, and even menu changes.

APPENDIX IV:

Partnerships

DEPOT MAINTENANCE PUBLIC-PRIVATE
Partnerships Reviewed and Depots Visited

Depot/ Partnership (year initiated)	Private-sector partner	Reason(s) for partnership	Expected annual value of work in depot
Anniston Army Depot			
Stryker-1 (2001)	General Dynamics Land Systems	Contractor sought out depot for its unique capabilities and advantageous labor rates.	$2 million
Direct sale/government-furnished resources–Depot performs finishing operations, paints the vehicle and provides production services. The contractor performs vehicle test and acceptance and supplies all parts and material for the production of the vehicle. Both the depot and the contractor perform vehicle assembly			
Stryker-2 (2001)	General Motors Defense	Contractor sought out depot for its unique capabilities and advantageous labor rates.	$40,000
Direct sale–Depot performs hull and component modification and repair. The contractor performs vehicle assembly, test and acceptance, and provides all parts and material.			
Fox Vehicle Upgrade-Services and Facility Use (1996)	General Dynamics Land Systems	Contractor sought out depot for its unique capabilities and advantageous labor rates.	$1 million
Direct sale/lease–Depot performs vehicle hull upgrade, tail upgrade, paints vehicle, disassembles engine, and removes asbestos. The contractor performs vehicle disassembly and reassembly, sub assembly, component rework, and systems integration and test.			
Fox Vehicle Maintenance-Facility Use (1996)	General Dynamics Land Systems	Provided collocation with related Fox vehicle upgrade partnership.	$30,000
Lease–Depot provides use of a facility. Contractor uses facility to receive, store, and issue Fox vehicle subassemblies, components and parts for fielded vehicles.			
Gunner's Primary Sight Manufacturing (1997)	General Dynamics Land Systems	Depot had available production facilities needed by the contractor.	$85,000
Lease–Depot provides use of a facility. Contractor performs manufacture of a new gunner's primary site.			
M113 Family of Vehicles Overhaul and Conversion (1997)	United Defense Limited Partnership	Program manager directed work share and contractor sought out depot for its unique capabilities.	$15.9 million [1] January 1997 through March 2002
Work share/lease–Depot performs vehicle disassembly, hull overhaul and conversion, and provides the "dismate" power pack. The contractor overhauls subassemblies and components, performs engine and suspension modification, vehicle assembly, systems integration and test, and final paint.			
M1/M1A2 Upgrade (1994)	General Dynamics Land Systems	Program manager directed work share.	$15.3 million
Work share–This is a partnership for the upgrade of the M1 tank to the M1A2 version. Depot performs vehicle receipt, disassembly, hull rework and upgrade, demilitarization of the turret, overhaul of major subassemblies and components, and then ships tank parts to the contractor in Lima, Ohio. Contractor performs vehicle reassembly, turret installation and systems test and integration.			
Partnership for Reduced Operation and Support Cost–Engine (1999)	Honeywell	Program developed by program manager, contractor, and depot to enhance current depot engine overhaul programs, and reduce operations and support costs.	$31,000
Lease–Depot provides use of underutilized facility to contractor. Contractor uses facility to supply parts and material to support the depot's turbine engine repair/overhaul line.			

Depot/ Partnership (year initiated)	Private-sector partner	Reason(s) for partnership	Expected annual value of work in depot
Recuperator Plate Manufacturing (1998)	Honeywell	Base realignment and closure (BRAC) process closed a government-owned facility where contractor performed work.	$200,000
Direct sale/lease–Depot provides material handling and movement, and the contractor manufactures recuperator plates.			
Abrams Integrated Management for the 21st Century (1996)	General Dynamics Land Systems	Program manager directed work share.	$47 million
Work share–This is a partnership for a recapitalization of the M1A1 tank. Depot performs vehicle receipt, disassembly; overhaul of hull, turret, and major subassemblies and components; and ships the tank to contractor in Lima, Ohio. The contractor performs vehicle reassembly and systems test and integration.			
Hercules (1998)	United Defense Limited Partnership	Program manager directed work share.	$9 million [1] January 1998 through March 2002
Work share–Depot performs vehicle disassembly, structural repair of the hull and front blade repair. Contractor performs modification, reassembly, and systems test and integration.			
Paladin (1998)	United Defense Limited Partnership	BRAC process closed a government-owned facility where contractor performed work.	$1.6 million [1] January 1998 through March 2002
Work share–Depot performs overhaul and conversion of chassis assembly and armament system, and provides turret kit components. Contractor fabricates and assembles the new cab, performs vehicle reassembly and systems test and integration.			
Wolverine (1998)	General Dynamics Land Systems	Program manager directed work share.	$1.6 million
Work share–Depot performs vehicle disassembly, hull rework, demilitarization of turrets, overhaul of major subassemblies and components, and ships the vehicles to the contractor in Lima, Ohio. Contractor performs chassis assembly, procures and installs bridge systems, and conducts inspections and testing.			
Opposing Forces Surrogate Vehicle (1999)	United Defense Limited Partnership	Contractor sought out depot for its unique capabilities and advantageous labor rates.	$8.2 million
Work share–Depot fabricates unique parts and spares; disassembles vehicle; cleans, machines, and repairs hull; repairs, converts and paints; and assembles and integrates turret. Depot also performs program management functions. Contractor overhauls subassemblies and components, modifies engine and suspension, assembles and paints vehicle, and performs final systems integration and testing.			
Corpus Christi Army Depot			
T700 Engine Overhaul and Repair (2000)	General Electric	Desire to reduce repair turnaround time.	$87.7 million [2]
Teaming–Depot provides the labor, facilities and equipment for the overhaul and repair of airframes and components. Contractor provides technical, engineering and logistical support, and spare parts to improve repair turn around time.			
H-60 Overhaul and Repair of Airframe and Structural Components (2000)	Sikorsky Aircraft Corporation	Desire to reduce repair turnaround time.	-- [3]
Teaming–Depot will provide the labor, facilities and equipment for the overhaul and repair of airframe and components. Contractor will provide technical, engineering and logistical support to improve repair turnaround time.			
AH-64 Apache and CH-47 Chinook Overhaul and Repair of Airframe Structures and Components (2000)	Boeing	Desire to reduce repair turnaround time.	-- [3]
Teaming–Depot will provide the labor, facilities and equipment for the overhaul and repair of airframes and components. Contractor will provide technical, engineering and logistical support, and some parts on an emergency basis.			

Depot/ Partnership (year initiated)	Private-sector partner	Reason(s) for partnership	Expected annual value of work in depot
T55/T53 Engines Overhaul and Repair Activities (2000)	Honeywell	Desire to reduce repair turnaround time.	-- [3]
Teaming–Depot will provide the labor, facilities and equipment for the overhaul and repair of engines. Contractor will provide technical, engineering and logistical support, and some parts to depot workstations.			
Red River Army Depot			
Bradley Fire Support Team Vehicle (2000)	United Defense Limited Partnership	Program manager directed work share	$17.5 million
Work share–Depot modifies and overhauls the A2 configuration of the Bradley fighting vehicle and transports the vehicle to the contractor's York, Pennsylvania facility. Contractor integrates the Bradley Fire Support Team capability into the vehicle.			
Heavy Expanded Mobility Tactical Truck (2001)	Oshkosh Truck Center	Program manager directed work share.	$7.5 million
Work share–Depot and contractor overhaul or recapitalize a complete vehicle and each partner performs work on an equal number of vehicles.			
Multiple Launch Rocket System M270A1 (2000)	Lockheed Martin	Program manager directed work share.	$700,000
Work share–Depot is overhauling vehicle chassis and components and transports completed chassis to contractor's overhaul facility. Contractor integrates and upgrades the Loader Launcher and its related components.			
Multiple Launch Rocket System Hoist Assembly (2001)	Lockheed Martin	Contractor sought out depot for its unique capabilities.	$347,200
Direct sale–Depot repairs the hoist assemblies and ships them to the contractor's plant in East Camden, Arkansas. Contractor installs the hoist on the vehicle.			
M915A4 Glider Program (2001)	Lear Sielgler	Contractor sought out depot for its unique capabilities.	$157,000 [1] March 2001 through March 2002
Direct sale–Depot provides support for testing qualifying and painting the engine and cleaning and painting the axel.			
Small Emplacement Excavator (2002)	Stewart & Stevenson Tactical Vehicle Systems	Contractor sought out depot for its unique capabilities.	-- [3]
Teaming–Depot and contractor have agreed to cooperate in potential partnerships on mutually beneficial programs and solicitations.			
Patriot Missile Conduit Cover Shields (2001)	Lockheed Martin	Contractor sought out depot for its unique capabilities.	$4,600 [4] During the partnership's 2-month period of performance
Direct sale–Depot provides all raw material and labor to manufacture Patriot missile conduit cover shields for the contractor. Contractor incorporates the shields into the Patriot missile.			
Tobyhanna Army Depot			
Communications Security Cryptographic Equipment (2002)	Titan Systems	Contractor sought out depot for its unique capabilities.	$4,900 [1] June 2002 through December 2002
Direct sale–Depot repairs circuit cards, which contractor uses in repair of communications security cryptographic equipment.			
Brackets and Racks, Local Area Network Box and Panel Display (2001)	TRW	Contractor sought out depot for its unique capabilities.	$137,000 [4] August 2001 to February 2002
Direct sale–Depot fabricated six items–Local Area Network Box Assembly, Remote TAU Radio Box Assembly, Flat Panel Display Assembly, V1 RWS Rigid Kit, and Router Adapter Plate Assembly. Contractor installed these parts in communications shelters as part of retrofit program.			

Depot/ Partnership (year initiated)	Private-sector partner	Reason(s) for partnership	Expected annual value of work in depot
FIREFINDER Block II Program (1999)	Raytheon	Contractor sought out depot for its unique capabilities and advantageous labor rates.	$305,000
Direct sale/teaming–Depot designed, manufactured, and tested two engineering development model Prime Power groups for the program; and provided cabling and interfaces needed to mount Portable Operations Suite in vehicles and power transfer boxes, as well as integration, test and logistics support at the system level. Contractor is responsible for overall design and manufacture of the weapon system.			
FIREFINDER AN/TPQ-37 Radar (2001)	Raytheon	Contractor sought out depot for its unique capabilities and advantageous labor rates.	$300,000
Teaming–Depot produces modular azimuth positioning system kits. Contractor incorporates kits into AN/TPQ-37 FIKREFINDER radars.			
Prophet Block I Cable Assemblies (2001)	Titan Systems	Contractor sought out depot for its unique capabilities.	$209,000 [1] June 2001 through March 2002
Teaming–Depot manufactures cable assemblies. Contractor is the prime for electronic warfare system that uses these cable assemblies.			
Area Common User System Program (1998)	CMC Electronics	Contractor sought out depot for its unique capabilities.	$500,000
Direct sale/teaming–Depot designed and manufactured modification installation kits that are installed by Laguna Industries at the depot and Fort Hood. The contractor provides the radio that is connected to existing systems using the depot's installation kit.			
Weapon Systems Omnibus-1 (1999)	Blackhawk Management, Inc.	Contractor sought out depot for its unique capabilities.	$941,000 [1] December 1999 through March 2002
Direct sale/teaming–Depot participated in program to secure repair workload on critical systems in order to help maintain critical capabilities and skills at the depot. The contractor markets the team's capabilities to potential customers and provides depot and other subcontractors with components for repair.			
AN/PRC-112 Modernization (2001)	EPS	Contractor sought out depot for its unique capabilities and to meet new weapon system title 10 core depot maintenance requirements.	$100,000
Direct sale/teaming–Depot assembles and warrants the field radio. Contractor manages overall contract and provides depot components needed to assemble the radio.			
CECOM Field Support Services-1 (2000)	EPS	Contractor sought out depot for its unique capabilities and advantageous labor rates.	-- [5]
Direct sale/teaming–Depot participated in program to secure repair workload on critical systems in order to help maintain critical capabilities and skills at the depot. The contractor markets its team's capabilities to potential customers and provides depot and other subcontractors with components for repair.			
CECOM Field Support Services-2 (2000)	Logistics, Engineering & Environmental Support Services, Inc.	Contractor sought out depot for its unique capabilities and advantageous labor rates.	-- [5]
Direct sale/teaming–Depot participated in program to secure repair workload on critical systems in order to help maintain critical capabilities and skills at the depot. The contractor markets the team's capabilities to potential customers and provides depot and other subcontractors with components for repair.			
Rapid Response to Critical System Requirements (1998)	ARINC	Contractor sought out depot for its unique capabilities.	-- [5]
Direct sale/teaming–Depot participated in program to secure repair workload on critical systems in order to help maintain critical capabilities and skills at the depot. The contractor markets the team's capabilities to potential customers and provides depot and other subcontractors with components for repair.			

Depot/ Partnership (year initiated)	Private-sector partner	Reason(s) for partnership	Expected annual value of work in depot
Rapid Response to Critical System Requirements (1998)	Lear Siegler	Contractor sought out depot for its unique capabilities.	-- [5]
Direct sale/teaming–Depot participated in program to secure repair workload on critical systems in order to help maintain critical capabilities and skills at the depot. The contractor markets the team's capabilities to potential customers and provides depot and other subcontractors with components for repair.			
Rapid Response to Critical System Requirements (1998)	Lockheed Martin	Contractor sought out depot for its unique capabilities.	$2,600 [1] October 1998 through March 2002
Direct sale/teaming–Depot participated in program to secure repair workload on critical systems in order to help maintain critical capabilities and skills at the depot. The contractor markets the team's capabilities to potential customers and provides depot and other subcontractors with components for repair.			
Navy Tri-Service (1999)	ARINC	Contractor sought out depot for its unique capabilities.	-- [5]
Direct sale/teaming–Depot participated in program to secure repair workload on critical systems in order to help maintain critical capabilities and skills at the depot. The contractor markets the team's capabilities to potential customers and provides depot and other subcontractors with components for repair.			
Weapon Systems Omnibus-2 (1999)	Information System Support Inc.	Contractor sought out depot for its unique capabilities.	-- [5]
Direct sale/teaming–Depot participated in program to secure repair workload on critical systems in order to help maintain critical capabilities and skills at the depot. The contractor markets the team's capabilities to potential customers and provides depot and other subcontractors with components for repair.			
Satellite Communications Equipment (2002)	Signal Corporation	Contractor sought out depot for its unique capabilities.	-- [5]
Direct sale/teaming–Depot participated in program to secure repair workload on critical systems in order to help maintain critical capabilities and skills at the depot. The contractor markets the team's capabilities to potential customers and provides depot and other subcontractors with components for repair.			
Naval Aviation Depot Cherry Point			
P-3, S-3, C-2, and F/A-18 Auxiliary Power Units (2000)	Honeywell	To satisfy title 10 core depot maintenance requirements for the workload involved and contractor sought out depot for its unique capabilities.	$5.3 million
Direct sale/teaming–Depot repairs power units providing repair facilities, skilled labor, support equipment, production engineering, and logistics support. Contractor provides failed power units, spare parts, engineering support, inventory management, and packaging and shipping.			
F/A-18E/F Integrated Readiness Support Teaming (2001)	Boeing	To meet new weapon system title 10 core depot maintenance requirements.	$885,000
Direct sale/teaming–Depot repairs components providing touch labor and depot maintenance logistics support. Contractor provides overall program execution, and customer and engineering support.			
AV-8B Remanufacture Program (1996)	Boeing	Program manager directed work share.	$6.5 million
Work share–Depot disassembles the AV-8B aircraft, repairs and/or modifies 287 components, and ships repaired components to contractor. Contractor installs components into new fuselage and delivers remanufactured aircraft to the Navy.			
SR-61/AS-61 Blades (1999)	Aviation Blade Services	Program manager directed work share.	$22,000
Work share–Depot dynamically balances turbine engine blades providing facilities, skilled labor, and logistics support. Contractor provides unbalanced blades.			
Naval Aviation Depot Jacksonville			
LAU-7, PP-2581A/A Power Supply (2000)	Associated Aircraft Manufacturing & Sales, Inc.	Contractor sought out depot for its unique capabilities.	$7,000 [1] July 2000 through August 2001

Depot/ Partnership (year initiated)	Private-sector partner	Reason(s) for partnership	Expected annual value of work in depot
Direct sale–Depot repaired components providing repair facilities, skilled labor, support equipment, spare parts, and technical data. Contractor provided failed components and shipping.			
Test and Repair Components on P-3, F/A-18, H-3 and H-60 (2002)	Aeronautical Systems, Inc.	Contractor sought out depot for its unique capabilities.	$27,042
Direct sale–Depot repairs components providing repair facilities, skilled labor, support equipment, and technical data. Contractor provides failed components, packaging, and shipping.			
AN/ALQ126B Countermeasures Set (2002)	BAE Systems	To satisfy title 10 core depot maintenance requirements for the workload involved and contractor sought out depot for its unique capabilities.	$771,428
Direct sale–Depot repairs components providing repair facilities, skilled labor, support equipment, and technical data; and collects and provides contractor with failure data. Contractor provides total asset management, failed components, repair parts, configuration management, technical and engineering support, and packaging and shipping; and investigates and incorporates reliability improvements.			
CF-18 Boresight (2002)	Boeing	Contractor sought out depot for its unique capabilities.	$12,000
Direct sale–Depot responsible for boresight calibration, shipment preparation, maintenance of inspection and test records, and reporting schedule and funding expenditures. Contractor responsible for inventory and asset tracking, preparation for shipping, repair parts, and technical support.			
F/A-18E/F Integrated Readiness Support Teaming (2001)	Boeing	To meet new weapon system title 10 core depot maintenance requirement.	$130,600
Direct sale–Depot repairs components providing repair facilities, skilled labor, and support equipment; and collects and provides contractor with failure data. Contractor provides total asset management, failed components, repair parts, configuration management, technical and engineering support, and packaging and shipping.			
F404 High Pressure Turbine Rotors (2001)	General Electric	Contractor sought out depot for its unique capabilities.	$350,000
Direct sale–Depot repairs components providing repair facilities, skilled labor, support equipment, and technical data; and collects and provides contractor with failure data. Contractor provides failed components, repair parts, and packaging and shipping.			
J52 Engines (2000)	General Electric	Contractor made business decision to close facility where work was previously done	$66,667
Direct sale–Depot repairs engines providing repair facilities, skilled labor, support equipment, spare parts and technical data. Contractor provides failed engines and shipping.			
Calibration, Metal Processing, and Engineering Support (2001)	Logistic Services International	Contractor sought out depot for its unique capabilities.	$61,111
Direct sale–Depot calibrates test stands, and provides metal processing and engineering support services. Contractor provides access to test stands requiring calibration and items requiring metal processing, and shipping to and from the depot.			
Various F-14, EA-6B, AH-1 and F-22 Antenna and Radome Testing (2000)	Neptune Technical Services, Inc.	Contractor sought out depot for its unique capabilities.	-- [5]
Direct sale–Depot was to provide antenna and radome testing, autoclave processing, coordination of measuring machine inspection, and technical data. Contractor was to provide components for testing and shipping.			
LAU-7, AN/APG-65, and AN/ARA-48 (2002)	S&K Technologies, Inc.	Contractor sought out depot for its unique capabilities.	$81,081
Direct sale–Depot repairs components providing repair facilities, skilled labor, support equipment, and technical data. Contractor provides failed components, and packaging and shipping.			

Depot/ Partnership (year initiated)	Private-sector partner	Reason(s) for partnership	Expected annual value of work in depot
AN/AWG-9 Fire Control Radar Components (1999)	System & Electronics, Inc.	Contractor sought out depot for its unique capabilities.	$19,000 [1] February 1999 through November 2002
Direct sale–Depot repairs components providing repair facilities, skilled labor, support equipment, and technical data. Contractor provides failed components and shipping.			
Naval Aviation Depot North Island			
F/A-18E/F Integrated Readiness Support Teaming (2001)	Boeing	To meet new weapon system title 10 core depot maintenance requirements.	$10 million
Direct sale/teaming–Depot repairs components providing touch labor, facilities, equipment, production engineering, technical data, and packaging. Contractor provides failed components, repair parts, obsolescence management, and shipping.			
Aircraft Painting (2002)	San Diego Aircraft Carrier Museum	Contractor sought out depot for its unique capabilities.	$150,000
Direct sale–Depot will paint aircraft providing touch labor, facilities and equipment. Contractor will provide ready-for-paint aircraft, specifications, and paint.			
Norfolk Naval Shipyard			
USS Enterprise Nuclear Aircraft Carrier (CVN 65) FY02 Extended Drydock Selected Restricted Availability (2001)	Northrop Grumman Newport News	Contractor sought out depot for its unique capabilities.	$4.5 million
Direct sale/government-furnished resources–Depot is providing a drydock and related facilities, and skilled labor. Contractor is providing skilled labor and overall management responsibility for this overhaul.			
USS Nimitz (CVN 68) and *USS Ronald Reagan* (CVN 76) Production Services (2000)	Northrop Grumman Newport News	Contractor sought out depot for its unique capabilities.	$1.8 million
Direct sale–Depot sold general production services–including pipefitting, sheet metal, and insulation–to contractor for these two overhauls. Contractor had overall responsibility for these overhauls.			
USS Dwight D. Eisenhower (CVN 69) and *USS Ronald Reagan* (CVN 76) Production Services (2001)	Northrop Grumman Newport News	Contractor sought out depot for its unique capabilities.	$440,000
Direct sale–Depot sold general production services–including pipefitting, sheet metal, electrician, and machinist–to contractor for these two overhauls. Contractor had overall responsibility for these overhauls.			
Portsmouth Naval Shipyard			
USS Memphis (SSN 691) FY02 Selected Restricted Availability/Restricted Availability (2002)	General Dynamics	Contractor sought out depot for its unique capabilities.	$28.9 million [6] between January 2002 and December 2002
Work share/teaming–Depot is providing manpower (60 percent) and has overall responsibility for submarine overhaul. Contractor is providing manpower (40 percent) and facilities–including a drydock.			
High Performance Brush (2000)	Noesis, Inc.	Contractor sought out depot for its unique capabilities.	$486,487
Direct sale–Depot provides equipment, technical support, and knowledge for testing services. Contractor provides program management, technical data, engineering expertise, and research and development expertise.			
Lease of Portsmouth Naval Shipyard Former Prison (1999)	Seavey Island, L.L.C.	Contractor sought out depot for its unique facility.	-- [5]
Lease–Depot provided facility. Contractor's intent was to refurbish facility and sublet as office space. Lease termination negotiations in process because of death of lessee.			
Puget Sound Naval Shipyard			
Nuclear Aircraft Carrier Maintenance Benchmarking (2001)	Todd Pacific Shipyards Corporation	Contractor sought out depot for its unique capabilities.	Partners are benefiting from improved repair processes. [5]

Depot/ Partnership (year initiated)	Private-sector partner	Reason(s) for partnership	Expected annual value of work in depot
Teaming–The partnership's intent is to study (benchmark) similar depot and contractor processes associated with nuclear aircraft carrier overhauls, which will contribute to a mutually beneficial goal of achieving the timeliest and cost effective ship repair processes.			
Nuclear Aircraft Carrier Maintenance Work Resource Sharing (1999)	Todd Pacific Shipyards Corporation	Partnership established to gain consistent planned and anticipated workload on nuclear aircraft carriers.	-- [5]
Direct sale/government-furnished resources–Depot subcontracts segments of its aircraft carrier to contractor owing to resource shortfalls. Contractor also does this in reverse. Depot supports contractor by accomplishing work in propulsion spaces owing to security classification. Contractor supports depot by providing resources such as painters, welders, and pipe fitters.			
USS John C. Stennis (CVN 74) Planned Incremental Availability (2000)	Northrop Grumman Newport News	Contractor sought out depot for its unique capabilities.	$156,000 [1] October 2000 through November 2002
Direct sale–Depot performed work in propulsion plant owing to security classification. Contractor was responsible for overhaul.			
Explosion Bulge Plate Testing Services (2000)	Northrop Grumman Newport News	Contractor sought out depot for its unique capabilities.	$31,000 [1] October 2000 through January 2001
Direct sale/government-furnished resources–Depot provided explosion bulge testing services. Contractor provided high-strength-low-alloy plates for testing.			
Puget Sound and Pacific Railway Contract (1944)	Puget Sound and Pacific Railway	1944 triggering event is unknown.	$375,000
Government-furnished resources–Contractor allowed use of Navy owned railway in exchange for normal maintenance to rails and roadbed. Depot provides funding for major maintenance and capital improvements.			
Guided Missile Attack Submarine (Nuclear Powered) Design Conversion (2001)	Electric Boat Corporation	Contractor sought out depot for its unique capabilities.	$67,000 [1] October 2001 through November 2002
Teaming–Depot will develop work packages for installation on submarine on the basis of contractor provided conversion drawings. Contractor will also provide all standard material, engineered components, and manufactured assemblies.			
Ogden Air Logistics Center			
Composites Umbrella Agreement (2002	Alliant Techsystems	Contractor sought out depot for its unique capabilities.	-- [3]
Direct sale/work share/lease–Depot provides touch labor, nondestructive inspection, and support equipment operators. Contractor provides engineering, supply chain management, and oversight.			
Digital Analog Test Station (2002)	Westest Engineering	Contractor sought out depot for its unique capabilities.	$10 million
Work share–Test station design is a joint engineering effort between depot and contractor. Contractor will fabricate test stations. Depot and contractor will share effort to rehost software test programs on new test station.			
F-16 Block 40 Avionics Software Maintenance/ Upgrade (2001)	Lockheed Martin	Contractor sought out depot for its unique capabilities.	$610,169
Work share/government-furnished resources–Depot performs software maintenance tasks. Contractor integrates products associated with these tasks into the avionics system.			
Global Positioning System Metric Tracking Program (2002)	Boeing and TRW	Contractor sought out depot for its unique capabilities and advantageous labor rates.	$1.2 million
Work share/government-furnished resources–Depot provides labor for program installation, and share responsibility for the development of program hardware and software requirements with the contractors. Contractor provides program management and engineering support.			

Depot/ Partnership (year initiated)	Private-sector partner	Reason(s) for partnership	Expected annual value of work in depot
Sacramento Competition Workload for KC-135 Programmed Depot Maintenance (PDM) and A-10 PDM and Commodities (1998)	Boeing	BRAC process closed a government-owned facility where work was performed.	--[5]
Teaming–Depot performed analytical inspection and painted A-10 aircraft, overhauled components and subcontracted KC-135 PDM workload to contractor. Contractor overhauled KC-135 aircraft. The Air Force transferred the contract management out of the depot; therefore, the depot no longer considers this a partnering effort–there is no ongoing partnering interaction between the depot and the contractor.			
Intercontinental Ballistic Missile Automatic Test Systems (2001)	TRW	Program manager directed work share.	$4.1 million
Work share–Depot provides labor to replace antiquated automatic test station. Contractor maintains overarching ICBM system integration responsibilities and oversight.			
B-2 Advanced Composite (1998)	Northrop Grumman	Contractor sought out depot for its unique capabilities.	$3.0 million
Direct sale/work share/government-furnished resources–Depot provides maintenance and repair for 413 different B-2 bomber panels, doors, and surfaces. Contractor provides engineering services and technical assistance.			
Oklahoma City Air Logistics Center			
B-2 Defensive Management System Tools Program Set (1999)	Northrop Grumman	Contractor sought out depot for its advantageous labor rates.	$800,000
Work share/lease–Depot performs specified development and software maintenance tasks. Contractor maintains total system performance responsibility for this support effort.			
Propulsion Business Area partnership (1999)	Lockheed Martin	BRAC process closed a government-owned facility where work was performed.	$270 million
Teaming–Depot performs overhaul and repair of F100 engines, modules, components, and fuel accessories. Contractor performs overhaul and repair of T56 and TF59 engines, modules, components, and fuel accessories.			
F100 Engine Test Cell (2002)	Pratt and Whitney	Contractor sought out depot for its unique capabilities.	$276,933
Direct sale–Depot performs jet engine testing. Contractor provides jet engines.			
F100 Eddy Current Workload (2002)	Pratt and Whitney	Contractor sought out depot for its unique capabilities.	$697,894
Work share–Depot inspects and polishes F100 engine parts. Contractor provides F100 engine parts.			
F100 Special Technologies Coating Facility (2002)	Pratt and Whitney	Contractor made business decision to close facility where work was previously done.	$57,000
Lease–Depot provides depot space and support to contractor. Contractor performs proprietary spray coating processes in depot spray booth.			
Warner Robins Air Logistics Center			
C130 Integrated Weapon System Support Program (2001)	Boeing	To meet new weapon system title 10 core depot maintenance requirements and contractor sought out depot for its unique capabilities.	$397,000
Work share/government-furnished resources–Depot provides software development and integration support for new components being added to aircraft, which increases the depot's software capabilities. Contractor maintains its overarching C-130 system integration responsibilities and oversight under the Air Force's Total Systems Support Responsibility contract; therefore, specific contractor tasks will vary depending on the specific subsystem.			

Depot/ Partnership (year initiated)	Private-sector partner	Reason(s) for partnership	Expected annual value of work in depot
C-17 Analytical Condition Inspection (1999)	Boeing	To meet new weapon system title 10 core depot maintenance requirements and contractor sought out depot for its advantageous labor rates.	$1.6 million
Direct sale–Depot identifies hidden defects, deteriorating conditions, corrosion, fatigue, overstress, and other conditions that affect structure of C-17 aircraft. Contractor provides the depot with engineering, parts, and equipment support.			
Flexible Acquisition and Sustainment Tool (2001)	Boeing, Lockheed Martin, MTC Inc., SSAI, and SAIC	Contractor sought out depot for its unique capabilities	-- [5]
Work share–Depot will provide labor to support delivery or task orders issued to one of five contractors under the Air Force's flexible acquisition sustainment tool contract. Contractor will manage the delivery or task orders to ensure performance; however, the specific contractor tasks will vary depending on the specific delivery or task order.			
Low Altitude Navigation Targeting Infrared for Night (LANTIRN) Phase I (1997)	Lockheed Martin	Contractor made business decision to close facility where work was previously done.	$123,000
Lease–Depot provides facility where contractor repairs LANTIRN components.			
LANTIRN Phase II (2001)	Lockheed Martin	Contractor made business decision to close facility where work was previously done, and contractor sought out depot for its unique capabilities and advantageous labor rates.	$796,000
Direct sale–Depot repairs 155 different components and delivers repaired components to contractor. Contractor provides failed components for repair.			
C-130 Avionics Modernization Program (2001)	Boeing	To meet new weapon system title 10 core depot maintenance requirements and contractor sought out depot for its unique capabilities and advantageous labor rates.	$1.4 million
Work share–Depot upgraded two laboratories to accommodate testing of upgraded avionics, and provides software engineering support to rehost operational flight software into upgraded avionics. Contractor provides upgraded avionics components for testing and rehosting.			
Joint Surveillance Target Attack Radar System (JSTARS) Total Systems Support Responsibility Partnership (2000)	Northrop Grumman	To satisfy title 10 core depot maintenance requirements for the workload involved.	$9.7 million
Work share–Depot performs prime mission equipment repair, system and ground support software maintenance, and various backshop functions. Contractor determines depot's work requirements, and provides depot with sustaining engineering and other support functions.			
Marine Corps Maintenance Center–Albany			
Amphibious Assault Vehicle Reliability, Availability, and Maintainability/Rebuild to Standard (1998)	United Defense Limited Partnership	Program manager directed work share.	$22 million
Work share/lease–Depot disassembles and reassembles vehicle; rebuilds transmission, electronics, generators, and other components; installs new engine; and blasts and paints vehicle. Contractor provides labor expertise and equipment to modify vehicle hulls.			

Depot/ Partnership (year initiated)	Private-sector partner	Reason(s) for partnership	Expected annual value of work in depot
Notes			
***Note 1**: No annual estimate available, but total revenue reported since partnership's inception.*			
***Note 2**: Partnership involves reengineering of ongoing workload.*			
***Note 3**: Partnership is in initial phase of development and implementation, and depot work has not yet begun – no annual estimate yet available.*			
***Note 4**: Partnership completed and total revenue generated.*			
***Note 5**: Although depot initially expected workload from this partnership, none has materialized and none is currently expected.*			
***Note 6**: Partnership expected to generate total listed.*			

TABLE IV-1: DEPOT MAINTENANCE PUBLIC-PRIVATE

APPENDIX V:

Financial Management

AWCF FY 2004/2005 BIENNIAL BUDGET ESTIMATES				
Personnel	**FY 2002**	**FY 2003**	**FY 2004**	**FY 2005**
Supply Management				
Civilian Full Time Equivalent (FTE)	3,063	2,869	2,937	2,904
Military Average Strength	13	13	13	13
Depot Management				
Civilian FTE	11,788	11,134	11,054	11,205
Military Average Strength	33	31	19	19
Ordnance Management				
Civilian FTE	5,957	5,559	5,581	5,401
Military Average Strength	17	18	18	18
Information Services				
Civilian FTE	276	266	0	0
Military Average Strength	7	6		
Total				
Civilian FTE	**21,084**	**19,828**	**19,571**	**19,510**
Military Average Strength	**70**	**69**	**56**	**50**
Revenue				
Supply Management	3,656.8	5,784.2	6,626.7	5,789.6
Depot Maintenance	1,668.4	1,731.3	1,858.2	1,891.7
Ordnance	669.8	609.0	600.5	554.0
Information Services	103.8	95.3	N/A	N/A
Total	**6,098.8**	**8,219.8**	**9,085.4**	**8,235.3**
Cost of Goods & Services Produced (Expenses) (All $ in millions)				
Supply Management [1]	3,720.7	5,356.6	6,532.1	5,789.6
Depot Maintenance [2]	1,733.3	1,749.6	1,814.7	1,871.1
Ordnance [3]	694.3	604.8	673.5	663.4
Information Services [4]	100.2	95.3	N/A	N/A
Total	**6,248.5**	**7,806.3**	**9,020.3**	**8,324.1**
Net (NOR) and Accumulated Operating Results (AOR) [5]				
Supply Management				
Net Operating Results	-317.9	238.6	-10.8	0
Accumulated Operating Results	-227.8	10.8	0	0
Depot Maintenance				
Net Operating Results	-98.5	-18.3	43.5	20.6
Accumulated Operating Results	-45.8	-64.1	-20.6	0.0
Ordnance				
Net Operating Results	-28.2	0.1	-72.4	-109.4
Accumulated Operating Results	181.6	181.7	109.4	0.0
Information Services				
Net Operating Results	3.7	0	N/A	N/A
Accumulated Operating Results	9.8	9.8	N/A	N/A
Totals				
Net Operating Results	**-440.9**	**220.4**	**-39.7**	**-88.8**
Accumulated Operating Results	**-82.2**	**138.2**	**88.8**	**0**

Notes:
[1] Spike in FY2004 cost reflects efforts to increase spare availability and reduce backorder levels.
[2] Growth due to price growth and program increases for recapitalization of legacy systems and equipment.
[3] Reduction includes a reduction of $65.5M in direct UPC funding.
[4] Cost reimbursable and will be decapitalized at end of FY2003.
[5] AWCF operates on breakeven basis and set revenue rates to achieve positive or negative results in order to bring the AOR to zero over the budget cycle; effectiveness is measured by comparing performance to the NOR goal.

TABLE V-1: AWCF FY 2004/2005 BIENNIAL BUDGET ESTIMATES

AFWCF FY 2004/2005 BIENNIAL BUDGET ESTIMATES				
Personnel	**FY 2002**	**FY 2003**	**FY 2004**	**FY 2005**
Supply Management				
Civilian Full Time Equivalent (FTE)	2,174	2,190	2,462	2,496
Military Average Strength	60	60	60	60
Depot Management				
Civilian FTE	21,728	21,898	21,966	21,546
Military Average Strength	297	237	238	235
Transportation - MSC				
Civilian FTE	NA	NA	NA	NA
Military Average Strength				
Information Services				
Civilian FTE	1,128	1,172	1,221	1,221
Military Average Strength	839	817	809	804
Total				
Civilian FTE	**25,030**	**25,260**	**25,649**	**25,263**
Military Average Strength	**1,196**	**1,114**	**1,107**	**1,099**
Revenue				
Supply Management	8,596.4	9,665.9	9,826.5	10,592.3
Depot Maintenance	6,746.5	6,015.3	5,734.7	5,917.2
Transportation	6,328.0	5,679.0	4,012.0	4,719.0
Information Services	629.6	608.0	641.4	675.3
Total	**22,300.5**	**21,968.2**	**20,214.6**	**21,903.8**
Cost of Goods & Services Produced (Expenses) (All $ in millions)				
Supply Management	8,420.8	9,597.0	9,593.6	10,436.2
Depot Maintenance	6,473.8	6,040.7	5,623.4	5,685.7
Transportation	5,648.0	5,706.0	4,542.0	4,732.0
Information Services	632.6	613.2	631.3	675.3
Total	**21,175.2**	**21,956.9**	**20,390.3**	**21,529.2**
Net (NOR) and Accumulated Operating Results (AOR)				
Supply Management				
Net Operating Results	204.6	88.8	264.0	187.9
Accumulated Operating Results	316.0	404.7	668.7	856.6
Depot Maintenance				
Net Operating Results	272.7	-25.4	111.3	231.5
Accumulated Operating Results	9.1	-16.3	70.0	231.5
Transportation				
Net Operating Results	723.0	-186.0	-529.0	-13.0
Accumulated Operating Results	728.0	524.0	13.0	0
Information Services				
Net Operating Results	-3.0	-5.2	10.1	0
Accumulated Operating Results	-2.6	-10.1	0	0
Totals				
Net Operating Results	**1,197.3**	**-127.8**	**-143.6**	**406.4**
Accumulated Operating Results	**1,050.5**	**902.3**	**751.7**	**1,088.1**

TABLE V-2: AFWCF FY 2004/2005 BIENNIAL BUDGET ESTIMATES

NWCF FY 2004/2005 BIENNIAL BUDGET ESTIMATES				
Personnel	**FY 2002**	**FY 2003**	**FY 2004**	**FY 2005**
Supply Management				
Civilian Full Time Equivalent (FTE)	6,450	6,171	5,360	5,254
Military Average Strength	418	428	424	419
Depot Management				
Civilian FTE	30,866	31,091	22,496	22,832
Military Average Strength	220	264	219	219
Research & Development				
Civilian FTE	39,027	39,001	37,706	37,713
Military Average Strength	657	636	631	633
Transportation – MSC				
Civilian FTE	5,907	6,146	6,466	6,768
Military Average Strength	731	719	624	637
Base Support				
Civilian FTE	8,099	8,317	8,300	8,275
Military Average Strength	106	108	108	108
Total				
Civilian FTE	**90,349**	**90,726**	**80,328**	**80,842**
Military Average Strength	**2,132**	**2,155**	**2,006**	**2,016**
Revenue				
Supply Management	7,109.2	7,635.4	6,876.3	7,120.8
Depot Management	4,720.6	4,751.7	3,488.6	3,644.5
Research & Development	9,463.5	8,731.0	8,711.4	8,365.6
Transportation	1,518.7	1,732.5	1,723.2	1,848.3
Base Support	1,692.0	1,622.6	1,469.4	1,522.1
Total	**24,504.0**	**24,473.2**	**22,268.9**	**22,501.3**
Cost of Goods & Services Produced (Expenses) (All $ in millions)				
Supply Management	6,977.2	7,797.3	6,864.5	7,120.8
Depot Maintenance	4,752.8	4,621.2	3,567.4	3,625.9
R&D	9,517.5	8,703.9	8,371.5	8,365.6
Transportation - MSC	1,553.3	1,723.3	1,701.1	1,848.3
Base Support	1,719.4	1,540.6	1,513.2	1,522.1
Total	**24,520.1**	**24,386.2**	**22,017.6**	**22,482.8**
Net (NOR) and Accumulated Operating Results (AOR)				
Supply Management				
Net Operating Results	132.3	-161.9	30.8	0
Accumulated Operating Results	131.1	-30.8	0	0
Depot Maintenance				
Net Operating Results	-32.2	130.5	-78.8	18.6
Accumulated Operating Results	87.5	42.9	-18.3	0
R&D				
Net Operating Results	-54.0	27.1	-20.1	0
Accumulated Operating Results	-7.0	20.1	0	0
Transportation				
Net Operating Results	-34.6	9.2	22.1	0
Accumulated Operating Results	-31.3	-22.1	0	0
Base Support				
Net Operating Results	-27.4	82.0	-43.8	0
Accumulated Operating Results	-38.2	43.8	0	0
Totals				
Net Operating Results	**-15.9**	**86.9**	**-89.8**	**18.6**
Accumulated Operating Results	**142.1**	**53.9**	**-18.3**	**0**

TABLE V-3: NWCF FY 2004/2005 BIENNIAL BUDGET ESTIMATES

PERFORMANCE INDICATORS LISTED IN WCF BUDGET FOR MILITARY SERVICES

AF WCF Stockage Effectiveness				
Measures how often the supply system has available for immediate sale that items it intends to maintain at base and depot level supply locations.				
Division	**FY 2002**	**FY 2003**	**FY 2004**	**FY 2005**
Materiel Support	73%	74%	75%	77%
General Support	87%	87%	87%	87%
Medical-Dental	94%	95%	95%	95%
Academy	97%	97%	97%	97%

NMCSR – Not Mission capable Supply Rate				
Percentage of time a weapons system is down for parts. Assuming no other factors impact aircraft availability, then the aircraft availability is computed 1 minus NMCSR. NMCSR is computed only for weapon systems, it is not computed for weapons system parts: such as engines.				
Weapon System	**FY 2002**	**FY 2003**	**FY 2004**	**FY 2005**
A-10	12.9%	12.9%	14.3%	14.9%
B-1B	21.1%	21.1%	22.4%	23.2%
B-2	5.6%	5.6%	6.4%	6.9%
B-52	10.7%	10.7%	11.8%	12.3%
C-5	17.5%	17.5%	18.7%	19.4%
C-130	13.0%	13.0%	14.3%	14.9%
C-135	9.8%	9.8%	10.6%	11.5%
C-141	14.0%	14.0%	15.5%	16.1%
E-3	9.4%	9.4%	10.1%	10.8%
E-4	11.7%	11.5%	11.0%	7.9%
E-8	4.9%	4.9%	4.9%	6.9%
F-4	0.0%	4.2%	5.6%	0.0%
F-15	9.6%	9.6%	10.7%	11.2%
F-16	12.0%	12.0%	13.1%	13.7%
F-22	0.0%	0.0%	0.0%	0.0%
F-111	0.0%	0.0%	0.0%	0.0%
F-117	4.1%	4.1%	4.9%	4.9%
H-1	0.0%	0.0%	0.05%	0.0%
H-53	11.0%	13.6%	12.7%	3.1%
H-60	17.5%	23.3%	26.8%	4.6%

TABLE V-4: PERFORMANCE INDICATORS LISTED IN WCF BUDGET FOR MILITARY SERVICES

US TRANSCOM Unit Cost				
Air Mobility Command Unit Cost	**FY 2002**	**FY 2003**	**FY 2004**	**FY 2005**
Channel Passenger (million passenger miles)	$238,663	$296,562	$261,714	$252,661
Channel Cargo (million ton miles)	$1,473,134	$1,701,372	$2,212,505	$2,393,948
SAAM/JCS (million ton miles)	$523,921	$681,963	$809,698	$832,650
Training C-17 (cost per flying hour)	$10,389	$7,818	$9,077	$9,200
Military Sealift Command Unit Cost	**FY 2002**	**FY 2003**	**FY2004**	**FY 2005**
Petroleum Tankership Ship Days	$40,073	$48,821	$36,134	$42,770
Surge Reduced Operating Status (ROS) Ship Days	$22,106	$18,262	$20,334	$21,947
Army Afloat Prepo Ship Days	$37,463	$40,991	$46,015	$46,210
Chartered Cargo Ship Days	$28,975	$31,466	$28,657	$28,214
Military Traffic Management Command Unit Cost				
Global POV	$3,172.00	$3,085.00	$3,112.00	$3,165.00
Liner Ocean Transport	$79.15	$61.59	$49.59	$49.69
Defense Courier Service Unit Cost				
Cost per 1,000 pounds delivered	$7,009	$5,638	$5,550	$5,650

US TRANSCOM Workload Actual and Forecast				
Recurring Peacetime Workload				
Air Mobility Command	**FY 2002**	**FY 2003**	**FY2004**	**FY 2005**
Training Flying Hours C-17 (AMC)	17,303	36,703	42,245	45,268
Channel Cargo Ton Miles	901.9	845.7	549.0	546.9
SAAM/JCS Ton Miles	3,845.4	2,858.3	1,166.3	1,163.8
Military Sealift Command				
Petroleum Tankership Ship Days (MSC)	3,843	2,503	2,928	2,628
Army Afloat Prepo Ship Days	3,365	4,745	4,392	4,380
DLA Afloat Prepo Ship Days	1,095	1,095	732	730
Defense Courier Service				
Pounds Delivered (thousands)	3,010	3,600	2,000	2,000

US TRANSCOM Customer Rate Changes				
Customer Rate Changes				
Air Mobility Command	**FY 2002**	**FY 2003**	**FY2004**	**FY 2005**
Channel Passengers	6.0%	10.7%	1.7%	1.8%
Channel Cargo	7.2%	11.0%	1.7%	1.8%
SAAM/JCS	-3.8%	0.4%	-1.3%	5.7%
Training	9.6%	-1.9%	2.7%	3.8%
Military Sealift Command				
Chartered Cargo	-4.4%	37.4%	-42.7%	33.4%
Petroleum Tankerships	14.4%	13.4%	-50.8%	54.0%
Surge FOS	45.6%	-8.7%	-5.4%	-5.3%
Surge ROS	45.6%	-8.7%	-9.6%	6.1%
Army Afloat Prepositioning	14.5%	11.7%	8.2%	-1.5%
Air Force Afloat Prepositioning	14.5%	11.7%	-2.9%	2.4%
DLA Afloat Prepositioning	14.5%	11.7%	-28.4%	22.5%
Military Traffic Management	**FY 2002**	**FY 2003**	**FY2004**	**FY 2005**
Cargo Operations	-40.0%	-38.3%	20.0%	23.9%
Global POV	-7.0%	-14.7%	15.6%	13.0%
Liner Ocean Transportation	-1.4%	-8.4%	-2.6%	-7.6%
Defense Courier Service				
Pounds Delivered	-22%	-4.4%	-.4%	3.7%

Marine Corps Depots				
Performance Indicators:	**FY 2002**	**FY 2003**	**FY 2004**	**FY 2005**
Schedule Conformance	97.5%	97.4%	99.5%	99.3%
Quality Deficiency Reports	0.2%	0.2%	0.2%	0.2%
Inventory Turnover Ratio	5.2:1	6.1:1	6.7:1	7.5:1
Stabilized Customer Rate	$105.81	$117.62	$126.30	
Composite Rate Change*	7.0%	11.17%	7.38%	1.02%
* The FY 2004 rate increase over the FY 2003 President's Budget is due to decreased workload and cost.				
Cost per Direct Labor Hour	$115.70	$136.08*	$135.05	$132.20
* Increase by18% due to declining workload coupled with increase hourly rate of direct material. , removal of VSIP cost, increased direct material cost for material intensive workload				

TABLE V-5: PERFORMANCE INDICATORS FOR US TRANSCOM AND MARINE CORPS DEPOTS

APPENDIX VI:

Acronyms

3PL	Third-Party Logistics
ACC	Air Combat Command
ADA	Anti-Deficiency Act
ADP	Automatic Data Processing
AFMCs	Air Force Material Command
AFWCF	Air Force Working Capital Funds
AIT	Automatic Identification Technology
AMC	Army Material Command
AMCOM	Army Aviation and Missile Command
AOA	Analysis of Alternatives
APML	Assistant Program Manager for Logistics
AREP	Aircraft Repair Enhancement Program
ASD	Americas Service Delivery
AWCF	Army Working Capital Funds
BCA	Business Case Analysis
BOM	Bill of Materials
BRAC	Base Realignment and Closure
CAT	Caterpillar
CCAD	Corpus Christi Army Depot
CCP	Customer Contact Person
CMOST	Center for the Management of Science & Technology
COEAs	Cost and Operational Effectiveness Analyses
CONUS	Continental United States
COTS	Commercial Off-the-Shelf
CREP	Contract Repair Enhancement Program
CRM	Customer Relationship Management
CTR	Continuous Technology Refreshment
CWT	Customer Wait Times
DARPA	Defense Advanced Research Projects Agency
DAU	Defense Acquisition University
DCMA	Defense Contract Management Agency
DLA	Defense Logistics Agency
DLP	Depot Level Reparable
DMAG	Depot Maintenance Activity Group
DOD	Department Of Defense
DREP	Depot Repair Enhancement Program
DWCF	Defense Working Capital Funds
EDI	Electronic Data Interchange
ERP	Enterprise Resource Planning
FDA	Food and Drug Administration
FIRST	F/A-18E/F Integrated Readiness Support Teaming
FMT	Fleet Management Team
FOC	Full Operating Capability
FRA	Forward Repair Activity
G&A	General & Administrative

GPS	Global Positioning System
GSA	General Services Administration
GSE	Ground Support Equipment
IAS	Implementation Agreements
ICP	Inventory Control Point
IM	Item Manager
IPT	Integrated Product/Process Team
ISAG	Information Services Activity Group
IT	Information Technology
ITAS	Improved Target Acquisition System
JSTARS	Joint Surveillance and Target Attack Radar System
LECP	Logistics Engineering Change Proposal
LM	Logistics Manager
LMI	Logistics Management Institute
LMP	Logistics Modernization Program
LRMOA	Long Range Memorandum of Agreement
MICAP	Mission Capable
MSC	Major Subordinate Commands
MTC	Modern Technology Corporation
NADEP	Naval Air Depot
NAMI	Non Army Managed Items
NAVAIR	Naval Air Systems Command
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply
NGC	Northrop Grumman Corporation
NMCS	Non Mission Capable Supply
NOR	Net Operating Results
NWCF	Navy Working Capital Funds
O&M	Operations and Maintenance
OACC	Oklahoma Air Logistics Center
OCONUS	Outside the Continental United States
OEM	Original Equipment Manufacturers
OMN	Operations & Maintenance Navy
OR	Operations Research
OSD	Office of Secretary of Defense
PA	Partnering Agreement
PBL	Performance Based Logistics
PDM	Programmed Depot Maintenance
PDSS	Post Deployment Software Support
PEO	Program Executive Office
PM	Program Manager
POM	Program Objectives Memorandum
PSI	Product Support Integrator
PSI/PSP	Product Support Integrator/Product Support Provider
PSIMT	Product Support Integrator Management Team
PWD	Procurement Work Directive

RCCL	Royal Caribbean Cruise Ltd.
RICE	Reports, Interfaces, Conversions and Extensions
RFP	Request For Proposal
SAC	Sikorsky Aircraft Corporation
SAIC	Science Applications International Corp
SARSS	Standard Army Information Systems
SCM	Supply Chain Management
SCCOP	Supply Chain Common Operating Picture
SKUs	Stock Keeping Units
SLA	Service Level Agreement
SMAG	Supply Management Activity Group
SOF	Special Operations Forces
SOW	Statement of Work
SPO	System Program Office
SSE	Synchronized Service Execution
SSF	Single Stock Fund
TACOM	Tank-Automotive and Armaments Command
TBD	To Be Determined
TLCSM	Total Life Cycle System Management
TQM	Total Quality Management
TSPR	Total System Performance Responsibility
TSSR	Total System Support Responsibility
TWCF	Transportation Working Capital Funds
UAH	University of Alabama Huntsville
VE	Value Engineering
VMI	Vendor Managed Inventory
WCF	Working Capital Funds
WMS	Warehouse Management System

TABLE VI-1: LIST OF ACRONYMS

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