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Report to the Chairman, Subcommittee on Readiness, Committee on Armed Services, House of Representatives

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DEFENSE LOGISTICS

Observations on Private Sector Efforts to Improve Operations

GAO/NSIAD-91-210

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National Security and
International Affairs Division

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The Honorable Earl Hutto
Chairman, Subcommittee on Readiness
Committee on Armed Services
House of Representatives

Dear Mr. Chairman:

You asked us to provide observations on efforts of private sector companies to improve their logistics operations and reduce inventory costs during the last decade. Recently, we issued you another report that discusses requirements determination problems within DOD.[1] These reports are part of our work on DOD's inventory management that the Comptroller General has identified as an area of particular risk for mismanagement, fraud, and abuse.

Results in Brief

Private sector firms have found that integrated logistics management can help reduce costs and increase their competitiveness. Major ingredients in their implementation of integrated logistics management have included total cost analysis and top management commitment. In addition, companies have found it useful to systematically compare their logistics with those of other organizations—a practice known as benchmarking. DOD has several ongoing initiatives intended to increase emphasis on economy and efficiency in logistics operations that are steps in the right direction. In addition, DOD may be able to benefit from these private sector experiences in improving their logistics operations.

Background

Logistics is the process of procuring, moving, handling, storing, maintaining, and distributing material and products from a supplier to a customer. The ultimate purpose of logistics management is to provide material where and when needed to support a given mission at the lowest possible cost. Logistics encompasses purchasing, packaging, production planning, materials handling, warehousing and storage, inventory control, transportation, order processing, and salvage and scrap disposal.

[1] Defense Inventory: Shortcomings in the Requirements Determination Processes (GAO/NSIAD-91-176, May 10, 1991).

Integrated Logistics Management

Top management officials in the private sector were forced to take a hard look at how they were organized and operated in the late 1970s as they were confronted by changing world markets and inflation. One method that companies adopted was integrated logistics management.

Integrated logistics management involves integrating such basic logistics functions as transportation, warehousing, inventory management, and customer service. Generally, the seven companies we visited started identifying all logistics costs and performing cost analyses to make cost-effective trade-offs among the various logistics functions. They also found that to achieve integrated logistics management, top management support was essential.

As a result of implementing integrated logistics, most of the seven companies we visit experienced notable inventory reductions. One company reduced its inventory rate from $1 billion to $569 million. Several companies also increased the rate of their inventory turnovers. One company increased its inventory turnover rate from 13 to 17 times per year. In addition, several companies reduced the number of their warehouses and distribution centers. One company reduced its number of warehouses from 27 to 6; another assimilated several hundred warehouses into 6 distribution centers.

Benchmarking

Benchmarking is one technique that the private sector uses to improve inventory efficiency. It involves taking a systematic look at other organizations to identify methods, practices, and processes that help improve performance so that they can be implemented in the home unit. All but one of the companies we visited used benchmarking. The benefits of benchmarking include improved operations, increased efficiency, and reduced costs.

Management at one company we visited described how benchmarking had helped its logistics unit to achieve remarkable gains in productivity. Before benchmarking, the unit's annual productivity gains averaged from 3 to 5 percent. After benchmarking, this figure increased to 10 percent. Another company we visited reduced overall transportation costs by 5 percent a year by implementing practices identified during benchmarking.

Possible Applications to DOD

The problems DOD is facing include reduced budgets, substantial growth in inventories, and problems with its accounting and financial management systems. In contrast to the budget growth of the 1980s, the 1990s promise to be a decade of constrained military budgets. As a result, DOD faces the difficult task of maintaining readiness despite fiscal constraints. The more DOD can cut its operating costs without sacrificing readiness, the less it will have to shrink the size and scope of its other activities. Faced with similar problems, many private sector companies have reduced their costs substantially by adopting integrated logistics management.

With its enormous logistics operation, DOD has numerous benchmarking opportunities. The challenge is to identify the opportunities with the largest potential benefits. We have reported on a number of inventory management areas in which DOD needs to improve its operations. These include procedures to prevent unneeded purchases of excess materials and the controls over shipments, including an accountability system for items while in transit.

Scope and Methodology

We consulted with academic logisticians and industry logistics advisers to identify current trends in logistics management and with retired military logisticians to discuss the possible applications of private sector practices to DOD. We also surveyed the wide range of available logistics-related research and literature to understand integrated logistics management principles. The literature provided us with a point of reference against which to compare and contrast our private sector companies' actual experiences with integrated logistics management theory.

We selected seven companies that our consultants identified as leaders in implementing and practicing integrated logistics management and who would agree to speak with us. The seven participating companies were General Motors Corporation, Hewlett-Packard, Land O' Lakes, Inc., Nabisco Brands, Inc., NCR Corporation, PPG Industries, Inc., and Xerox Corporation. We agreed to omit company names in specific discussions in our report. We interviewed logistics executives and managers at the participating companies using a structured series of questions that were reviewed in advance by several academic logisticians.

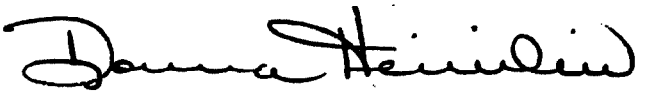
We performed our review from May 1990 to February 1991.

Appendix I discusses integrated logistics management, and appendix II discusses benchmarking.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 2 days from its issue date. At that time, we will send copies to other interested congressional committees and Members of Congress, the Secretary of Defense, and the Director of the Office of Management and Budget. We will also make copies available to others upon request.

If you have any questions, please call me on (202) 275-8412. Other major contributors are listed in appendix III.

Sincerely yours,



Donna M. Heivilin
Director, Logistics Issues

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Abbreviations

DOD	Department of Defense
GAO	General Accounting Office

Observations on Integrated Logistics Management

Key Elements of Integrated Logistics Management

In the late 1970s, top management officials in the private sector, including some of the companies we visited, were forced to examine how their companies were organized and operated as they were confronted by global markets and competition, mature domestic markets, inflation, and deregulated transportation and communications markets. One method that companies adopted in this changed business environment was integrated logistics management. Integrated logistics management involves integrating such basic logistics functions as transportation, warehousing, inventory management, and customer service. Generally, the companies we visited made cost-effective trade-offs among the various logistics functions.

Total Cost Analysis

Total cost analysis emphasizes (1) developing complete and accurate cost information for all logistics functions and operations and (2) using this information to make cost trade-offs among logistics functions. For example, once the total logistics costs, such as transportation, warehousing, inventory, maintenance, and order processing and information systems, are identified they can be analyzed to determine how to minimize the total cost.[1] The benefits of such trade-offs include reductions in excess inventories, decreased logistics costs, and increased customer satisfaction.

According to Ernst and Whinney,[2] management generally underestimates the impact that logistics has on costs, and total cost analysis often provides management with its first real glimpse of total logistics costs. They pointed out that management was surprised to learn that logistics costs could represent up to 40 percent of the cost of sales. One company we visited said its logistics costs amounted to about 50 percent of the corporate budget.

The benefits of total cost analysis are most clearly demonstrated by the trade-offs that it makes possible among logistics functions. For example, one company used a higher cost transportation service to respond to decreasing customer satisfaction and a build-to-order manufacturing method. Officials told us that their inventory and warehousing cost reductions more than compensated for the increased transportation costs, and they were able to meet their customer satisfaction goals.

[1]Douglas Lambert and James Stock, Strategic Logistics Management (Homewood, IL: Irwin, 1987).

[2]Ernst & Whinney National Distribution/Logistics Group, Corporate Profitability & Logistics Innovative Guidelines for Executives (Council of Logistics Management and National Association of Accountants, 1987).

Most of the companies we visited said while implementing total cost analysis is important, it is an evolutionary process. In fact, one company still has not fully implemented and refined its cost collection and analysis capabilities. The firm's representatives stated that the lack of adequate accounting did not deter them from moving towards total cost analysis. Another company's accounting system could not provide the necessary cost data, so the company manually collected these costs. The logistics group then manually made the necessary cost trade-offs among logistics functions. The company has since developed a computer model to help make the trade-offs.

Top Management Support

The seven companies we visited said that top management support was essential to successfully integrate the logistics functions. Top management officials first had to recognize that a logistics problem existed. They generally only took action after mid-level logistics managers showed them just how much money they could save by increasing logistical efficiency. These logistics managers had learned about integrated logistics management through trade publications, trade associations, and the academic community.

When integrating its logistics functions, a company sometimes changes its organizational structure. We noted two types of organizational changes that took place. Some companies promoted their logistics managers to a higher organizational level. In most cases, top logistics managers have risen to the same level as the managers of such traditionally powerful areas as marketing, manufacturing, and finance.

At some companies, the traditional logistics functions, such as transportation, warehousing, and inventory control, were combined into one logistics organization. This process of streamlining logistics functions also resulted in nontraditional functions being moved under the logistics umbrella. In some of the companies we visited, these functions included customer service, purchasing, and order processing. For example, one company integrated its transportation and warehousing divisions to form a logistics division. Eventually, other functions such as inventory management, production planning, inbound and outbound transportation, forecasting, and customer service were added to the division. The vice president in charge of this division was placed at the same level as the vice presidents of sales and marketing.

An Ernst and Whinney study[3] discusses Xerox Corporation's success story to illustrate the value of change to integrated logistics management. The logistics executives at Xerox's Business Systems Group transformed a typical logistics center that simply incurs costs into a department that functions as a profit center to better meet its strategic objectives. The Business Systems Group employed some 1,200 people in the logistics/distribution area and managed over $250 million in parts and consumable inventories throughout the logistics pipeline. To change its focus, the logistics department followed four key steps:

- Establish benchmarks. Available industry data was used to create benchmarks for expenses, inventory turnover, and service levels. Then, a "market value" was established for functions performed by logistics.
- Negotiate service levels. The department set up a "fee schedule" based on expenses and service degrees and negotiated level-of-service contracts with its internal customers (other Xerox units).
- Bid for business. The department solicited business from other Xerox divisions, bidding against competing logistics units or outside service contractors. In this way, the company obtained good service at competitive rates.
- Sell to outsiders. The logistics department contracts to provide the full complement of distribution services to non-Xerox companies. Also, it can supply individual distribution services such as warehousing for outside clients.

According to the study, the benefits to Xerox of this "profit center" approach far exceeded those of more direct efforts at improvements in the company's logistics operations. The system forced other divisions (customers) to define their true service needs, recognizing the costs involved. As a result, they purchased only the level of service they needed. That, in turn, allowed logistics managers to structure their operations to provide the scope and levels of service truly needed to support the overall business plan. As a result, the company recorded unprecedented logistics productivity improvements averaging 12 percent for 3 years. At the same time, service satisfaction became evident among customers and the other Xerox business units they support.

[3]Ernst & Whinney National Distribution/Logistics Group, Corporate Profitability & Logistics Innovative Guidelines for Executives (Council of Logistics Management and National Association of Accountants, 1987).

The Benefits of Integrated Logistics

Officials at all seven companies we visited said their companies had realized significant benefits from implementing integrated logistics. This was true even of those companies that had not completely implemented an integrated logistics system. Most of the companies experienced notable inventory reductions. One company reduced its inventory by $1.6 billion, another by $400 million. A third company reduced its inventory from $1 billion to $569 million.

Another benefit realized by several companies was an increase in their inventory turnover rates. As inventory turnovers increase, both levels of inventory and associated carrying costs decrease, resulting in cost savings. One company's inventory turnovers increased from 13 to 17 per year, while another reported an increase from 1.8 to 2.5 per year.

Several companies also reduced the number of their warehouses and distribution centers. One company reduced its number of warehouses from 27 to 6; another assimilated several hundred warehouses into 6 distribution centers. Another company reduced the number of its warehouses from 5 to 1, with the last one scheduled to be closed in 1991.

Another area where companies realized cost savings was transportation. At one company, inbound and outbound transportation costs were reduced by $310 million. Another company realized a 5-percent reduction in transportation costs. A third company was able to totally eliminate its trucking fleet by centralizing the transportation function under the logistics operation and using commercial trucking.

Applications to DOD

Historically, the defense budget has experienced periodic upswings and downswings. During the upswing of the 1980s, the Reagan administration spent over $2 trillion on defense. DOD now faces significant reductions in defense appropriations for the foreseeable future. The estimated 1995 defense budget is $10 billion less than the 1991 budget.

As a result, DOD faces the difficult task of maintaining readiness despite fiscal constraints. The more DOD can cut its operating costs without sacrificing readiness, the less it will have to shrink the size and scope of its other activities. Faced with similar problems, many private sector companies changed their logistics practices and reduced their costs substantially.

The problems DOD is facing include substantial growth in inventories, reduced budgets, and problems with its accounting and financial management systems. Some of this inventory growth can be attributed to several factors, including inflation, force structure expansion and modernization, and long-needed readiness enhancements based on life-cycle equipment support costs. However, a study by the Logistics Management Institute attributed much of the growth in DOD inventories to specific management policies and procedures.[4]

As we reported, the Air Force does not have accurate cost data for almost all of its non-cash assets, such as inventory, equipment, aircraft, and missiles.[5] Today's environment requires greater emphasis on costs and how to control them. We have found that federal agencies' accounting systems do not routinely accumulate and report on costs associated with their various operations. Until they do, meaningful efforts to control costs and achieve financial efficiency cannot occur.[6] The DOD Comptroller stated that he believed a GAO audit of the Army and Navy similar to the Air Force financial audit would reveal many of the same conditions.[7]

DOD's inventories have grown significantly. DOD's inventory of secondary items[8] grew from $43 billion as of September 30, 1980, to $101.9 billion as of September 30, 1990. As we reported in March 1990,[9] the key to resolving long-standing logistics problems rests with top management in the services and DOD. To cure its inventory management problems, DOD needs to change its corporate culture and streamline its organizational structure. A change in management's mindset is also needed.

DOD has several ongoing initiatives intended to increase emphasis on economy and efficiency in logistics operations and lead to changes in the

[4]Inventory Management: Beneficial Practices from the Private Sector (Feb. 1985).

[5]Financial Audit: Air Force Does Not Effectively Account for Billions of Dollars of Resources (GAO/AFMD-90-23, Feb. 23, 1990).

[6]Financial Audit: Air Force Does Not Effectively Account for Billions of Dollars of Resources (GAO/T-AFMD-90-11, Mar. 8, 1990).

[7]Improving Financial Management (Testimony by the DOD Comptroller, Mar. 8, 1990).

[8]DOD defines secondary items as minor end items; replacement, spare, and repair components; and personnel support and consumable items. Examples of secondary items include aircraft, tank, and ship components; construction, medical, and dental supplies; and food, clothing, and fuel.

[9]Defense Inventory: Top Management Attention Is Crucial (GAO/NSIAD-90-145, Mar. 26, 1990).

logistics culture. These initiatives include its Inventory Reduction Program, Unit Cost Initiative, Corporate Information Management effort, Total Quality Management effort, and certain Defense Management Report initiatives. DOD's March 1991 progress report on implementation of the Inventory Reduction Plan describes favorable results regarding its efforts to address overall inventory management. However, as DOD acknowledges, further improvements are needed.

Benchmarking as a Technique for Inventory Management

Benchmarking is the search for industry's best practices that lead to superior performance.[1] It enables private sector companies to identify and adopt practices that improve operations, increase efficiency, and reduce costs. DOD and private industry have similar basic logistics functions. Some of DOD's problem areas that we have identified in the past could be good candidates for benchmarking, such as procedures to prevent purchases of excess material and controls over shipments, including an accountability system for items while in transit. All but one of the companies we visited used benchmarking.

Benchmarking

Benchmarking involves taking a systematic look at other organizations to identify methods, practices, and processes that can help them attain superiority. It is designed to allow managers to understand how their functional performance compares with other companies, particularly those companies that excel in that function, and to identify why their performance differs. Benchmarking can be defined as:

- measuring performance against "best-in-class" companies;
- determining how those companies achieve high performance levels; and
- using the information as the basis for a company's targets, strategies, and implementation.[2]

A direct competitor that is exceptionally efficient might be a logical candidate for benchmarking but may be unwilling to participate. The most preferred benchmark may well be in an entirely different industry. The choice of a benchmark should be made on the basis of how well a company performs the function under scrutiny.

Benchmarking focuses on practices and processes. Adopting a systematic approach to changing current practices or methods of performing a process is the key to improving the effectiveness of the process.

Basic Steps

The first step in the benchmarking process is to identify the function to benchmark, such as warehousing, transportation, or inventory management. Benchmarking can be applied to virtually any or all areas of an

[1]Information for this chapter was primarily derived from: Robert C. Camp, Benchmarking: The Search for Industry Best Practices that Lead to Superior Performance (Milwaukee, WI: American Society for Quality Control, 1989).

[2]Lawrence S. Pryor, "Benchmarking: A Self-Improvement Strategy," The Journal of Business Strategy (Nov.-Dec. 1989), p. 28.

organization. The next step is to pinpoint the areas that require improvement. Once these initial steps have been taken, the company should:

- Decide who will do the benchmarking. Probably a mix of line and staff personnel concerned with the function(s) is the best solution, because of concerns for quality, continuity, and implementation of the adopted practices.
- Determine which companies will be selected for benchmarking. The key here is to select organizations that have achieved excellence in the functions to be benchmarked and that are willing to cooperate with the benchmarking effort. Published materials and communication networks, among other sources, can help identify candidates.
- Perform the benchmark investigation. The benchmark team must possess a thorough understanding of internal functions before visiting other companies to compare and assess their respective practices. During a visit, the team seeks quantitative measures of the performance of the organization visited and attempts to understand the methods used to achieve that level of performance.
- Develop improvement initiatives. In some cases, the methods observed in the benchmarking visit may be candidates for direct imitation. Frequently, however, some effort will be required to adapt those methods to the special circumstances of the home organization.
- Implement the initiatives. Whether benchmarking spurs strategic redirection of the function or relatively minor adjustment to an operating method, executing change often takes much time and effort. When implementation is a protracted process, milestones or other performance indicators should be established to measure progress.

Company officials said that successful benchmarking requires changing traditional ways of thinking by personnel at all levels of the organization. Benchmarking requires management to be willing to commit itself to the seemingly radical proposition that the logical way to develop internal operational goals is to look outside of the organization.

A Case Study in Benchmarking

The rewards of persistently using benchmarking processes and applying the lessons learned are attested to by several of the companies we visited. One of the most commonly cited benchmarking "success stories" in logistics literature concerns Xerox and L.L. Bean.[3] Xerox is the world's

[3]Frances Gaither Tucker, Seymour M. Zivan, and Robert C. Camp, "How to Measure Yourself Against The Best," Harvard Business Review (Jan./Feb. 1987), p. 8.

largest provider of copiers, duplicators, and electronic printers. L.L. Bean is an outdoor sporting goods retailer and mail-order house. Yet when Xerox's logistics and distribution unit identified its picking process[4] as the worst bottleneck in the receiving-through-shipping sequence, it looked for a suitable noncompetitor to benchmark in this area.

Xerox searched trade journals and held conferences with professional associations and consultants to find the companies with the best reputations in the distribution business. L.L. Bean was singled out as the best candidate for benchmarking because of the great importance placed upon, and remarkable effectiveness of, its warehousing and shipping function. Both companies required warehousing and distribution systems that could handle products that are diverse in size, shape, and weight. Of all the functional areas that L.L. Bean depends on, the warehousing and shipping function is among the largest and most important.

When Xerox personnel conducted the benchmarking process, they discovered that they were less efficient in picking orders than L.L. Bean. As a result of their benchmarking efforts, Xerox incorporated some of L.L. Bean's practices in a program to modernize its warehouses. After Xerox incorporated these practices, the unit's annual productivity gains increased to 10 percent from an average of 3 to 5 percent. In addition, participants in the benchmarking process discovered that the experience served to enhance their professional growth.

Other Uses of Benchmarking

One company official said that benchmarking has been "not just mildly successful, but enormously successful." This company had changed its business strategy and had moved inventory management responsibility for certain products to the business unit. The business unit, besides being required to take over inventory management, was directed to make cost reductions. It was uncertain how to handle this new function and concerned how these changes would affect customer service and decided to use benchmarking to achieve these objectives.

The actual process proceeded in several stages. First, the business unit conducted internal benchmarking to precisely define the company's current processes. Next, it searched trade journals and held conferences with consultants to find a company to benchmark. It sought a company that was using an inventory management information system that could be implemented in a year or less, required few resources (two or three

[4]The picking process involves assembling a customer's order from items in inventory.

employees and a consultant), had a sales channel similar to its own, and had a management measurement system implemented.

The business unit finally selected a company for benchmarking because this company had improved its inventory turnover rate from 4 turnovers per year (the benchmarking company's current rate) to 12 turnovers per year. Benchmarking provided them with a management strategy for how to organize, distribute inventory between the factory and business unit, and manage the interactions between information system personnel and inventory management personnel. As a result, the company expects to achieve a turnover rate of 6 or 7 turnovers per year under the current manual system. After it implements a mechanized system, it expects to increase to 10 to 12 turnovers per year.

Another company used benchmarking to correct inefficiencies in its transportation network. Even though these problems had previously been identified, management was uncertain as to how to approach them. Practices that were identified during benchmarking were initially implemented only at several facilities and then nationally. These new practices allowed the company to reduce overall transportation costs by 5 percent per year, improve the on-time delivery rate to 95 percent, and reduce the number of carriers from 100 to 50.

Use of Benchmarking in DOD

Even though DOD has long maintained that its inventory size and mission are unique, others and we have reported on logistics problems that indicate that DOD could benefit from benchmarking. The point of benchmarking is not to identify a duplicate company, but rather to find a company that has mastered a particular type of process or practice. DOD and private industry have similar basic logistics functions that involve the same processes (e.g., warehousing function). The two basic operations of a warehouse are movement and storage. Movement entails receiving goods into the warehouse, placing material in the warehouse, picking material to fill orders, and loading the material for shipment. Storage is the holding of material until needed.

We have reported on a number of DOD inventory management areas that might be good candidates for benchmarking. We have identified DOD's inventory management as an area of particular risk for mismanagement, fraud, and abuse. In March 1990, we summarized our past reports on DOD inventory management.[5] Some specific areas needing improvement

[5]Defense Inventory: Top Management Attention is Crucial (GAO/NSIAD-90-145, Mar. 26, 1990).

include procedures to prevent purchases of excess materials and controls over shipments, including an accountability system for items while in transit. Most recently we found the following:

- In March 1990,[6] we reported that the Defense Logistics Agency had established relatively high thresholds for considering the cancellation of excess material on order. For example, at the Construction Supply Center contracts falling below $25,000 were not considered for termination, which excluded 98.5 percent of the Center's contracts. Also, item managers were incorrectly recomputing requirements or arbitrarily increasing requirements to avoid recommending terminations.
- In July 1988,[7] we reported that supply depots did not accurately report receipts, and DOD could not confirm receipt for 87 of 453 shipments in our sample. DOD could not determine whether the shipments were stolen or were received at depots but misplaced. Also, material in transit was not being effectively controlled. In January 1991,[8] we reported on the lack of an adequate accountability system for property being transferred from units to disposal offices.

[6]Defense Inventory: Defense Logistics Agency's Excess Materiel on Order (GAO/NSIAD-90-105, Mar. 6, 1990).

[7]Inventory Management: Receipt Confirmations Problems (GAO/NSIAD- 88-179, July 14, 1988).

[8]Property Disposal: Controls Needed to Preclude DOD Release of Unsafe Surplus M151 Jeeps (GAO/NSIAD-91-10, Jan. 2, 1991).

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