GAO

United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

B-222859

November 10, 1992

The Honorable Richard B. Cheney
The Secretary of Defense

Dear Mr. Secretary:

This letter presents the results of our review of the inventory manager position at the Defense Logistics Agency (DLA). Our objective was to obtain information on inventory managers' practices in selected DLA Inventory Control Points[1] and selected private sector companies: Ford Motor Company, International Business Machines, Delta Air Lines, Boeing Company, and United Air Lines. The private sector operated differently than DLA in three areas: (1) the use of forecasting tools, (2) the emphasis on expediting deliveries of material on order, and (3) visibility of assets below the wholesale level.

BACKGROUND

As of November 1992, DLA had about 800 inventory managers, who manage more than 3 million items. These managers are responsible for many aspects of defense supply, including requirements validation, demand forecast review, procurement activity initiation, requisition processing, and management of excess assets on hand and on order. The inventory managers use an automated inventory management system that periodically compares inventory requirements with assets and forecasts demands. This system is also used to recommend actions to increase or reduce stock levels to meet projected requirements.

[1]Defense Personnel Support Center, Defense Industrial Supply Center, Defense General Supply Center, and Defense Electronics Supply Center.

FORECASTING IS A MAJOR DIFFERENCE BETWEEN DLA AND THE PRIVATE SECTOR

A major difference exists between DLA and the private sector in how demand is forecasted. DLA currently uses a single forecasting model (double exponential smoothing)[2] to predict demand for all of its replenishment items. However, an analysis by DLA's Operations Research and Economic Analysis Office (DORO) showed that this model used at DLA centers could be improved to reduce long-term forecasting errors and reduce safety levels.

Unlike DLA, the private sector companies we visited utilized automated multiple forecasting models that used different techniques to forecast demand for each item. For example, one company's model provided a total of five forecasting techniques capable of responding to a variety of demand scenarios, such as seasonal demand. As a result of using multiple forecasting models, company officials said they have maintained lower inventory levels and have a reduced forecasting error.

DLA Evaluating Two Multiple Forecasting Models

DLA plans to evaluate two different multiple forecast models: a statistical demand forecast (SDF) developed by the Navy's Aviation Supply Office in 1989 and a multiple demand forecast developed by DORO in 1990. DLA plans to test these models simultaneously at the Defense Industrial Supply Center in 1993.

The SDF model uses multiple forecast techniques and is based on two key assumptions: (1) inventory managers are more aware of the demand patterns for their items and therefore should establish the forecasts for the items and (2) once established, the demand forecast should not be changed unless it can be clearly demonstrated that there is significant change in the demand data. The SDF model requires an initial investment of the inventory manager's time to set up the forecast. However, it should reduce the

---

[2]Double exponential smoothing is a forecasting process in which the most recent demand periods have the greatest influence on the forecast. This influence diminishes exponentially as the demand ages to the point where demand more than 2 years old has no effect on the results.

number of work products the manager needs to review after the forecast is established.

The SDF model has recently been implemented by the Navy's Aviation Supply Office. Navy officials told us that SDF should help keep inventory levels low and result in accurate and more stable forecasts. An independent study done for the Navy showed that SDF could increase supply availability while reducing investment in inventory.

DLA's automated multiple forecasting model utilizes four basic forecast techniques. The model can also forecast demand using any two combinations of these techniques. Unlike SDF, multiple demand forecasting automatically selects the most appropriate technique and requires little, if any, involvement by inventory managers. The forecast is updated each quarter when new demand data becomes available.

PRIVATE SECTOR COMPANIES PLACE GREATER EMPHASIS ON EXPEDITING MATERIAL

In two of the private sector companies we visited, inventory managers spend most of their time ensuring that material on order flows into the supply system. For example, inventory managers at one company process all of their recommended buys during the first week of each month. The managers then spend the remaining 3 weeks ensuring that vendors have accepted purchase requests and that the distribution system is receiving vendor shipments in the correct quantity. At another company, supply management officials characterized their inventory managers as "parts chasers," who spend a majority of their time expediting shipments into the distribution system.

According to DLA inventory managers and supply operations officials we interviewed, inventory managers spend very little time expediting the flow of material into the supply system. Instead, they spend most of their time processing computer-generated work products, including recommended buy studies, requisition violations, and stratification reports. With DLA's present structure, inventory managers must coordinate with separate contract management units (who deal with government procurement regulations) to facilitate the flow of material into the supply system.

Although DLA is not placing as much emphasis on expediting material as the private sector, it has several initiatives underway to improve the coordination between inventory

managers and contract management personnel. For example, two DLA hardware centers we visited were implementing one of these initiatives--collocation--where procurement and inventory management personnel work together in common organizational units.

PRIVATE SECTOR COMPANIES HAVE GREATER VISIBILITY OF ASSETS BELOW THE WHOLESALE LEVEL

Unlike some private sector firms, DLA does not have visibility of inventory at lower levels of the supply system, such as the retail or the end user level. Requirements computation systems at several of the firms we visited had visibility of parts inventories, down to the actual maintenance locations where repairs are performed. One firm considered this visibility to be a factor in reducing overall inventory levels. This firm can respond to local shortages by transshipping excesses held at other end-use locations, rather than procuring additional stock. DLA's requirements computation system, on the other hand, only has visibility of inventory at the wholesale depot level. The lack of complete asset visibility hampers DLA inventory managers in their management of excess assets at lower levels of the supply system. DOD has plans to improve visibility of retail level inventories.

- - - -

While we are not making any recommendations, we believe it is important that DOD closely monitor the forecasting model test results and the collocation initiatives in DLA as well as DLA's efforts to establish retail level asset visibility. We would appreciate DOD apprising GAO of the results of these initiatives and your plans for implementation. We appreciate the cooperation and assistance provided by DLA officials. Should you or your staff have any questions concerning this assignment, please call me on (202) 275-8412.

Sincerely yours,

Donna M. Heivilin
Director, Logistics Issues

(398082)