BY THE U.S. GENERAL ACCOUNTING OFFICE

Report To The Secretary Of The Air Force

Air Force Uses Inaccurate Production Leadtime To Compute Spare Parts Requirements

The Air Force needs to improve its procedures and controls to insure that appropriate production leadtimes are used in determining requirements for spare parts. The Air Force also needs to work more closely with contractors and Government representatives at contractor plants to stay abreast of changing conditions that affect these leadtimes.

GAO/PLRD-83-85
JUNE 16, 1983

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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

NATIONAL SECURITY AND
INTERNATIONAL AFFAIRS DIVISION

B-211348

The Honorable Verne Orr
The Secretary of the Air Force

Dear Mr. Secretary:

This report discusses the need for the Air Force to improve its procedures and controls to insure that appropriate production leadtimes are used in determining requirements for spare parts.

We discussed a draft of this report with representatives of the Department of Defense and the Air Force. Their comments have been incorporated, where appropriate, in the report.

This report contains recommendations to you on pages 11 and 20. As you know, 31 U.S.C. § 720 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of this report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of this report.

We are sending copies of this report to the Secretary of Defense; selected committees of the Congress; the Director, Office of Management and Budget; and other interested parties.

Sincerely yours,

D. J. Horan

for Frank C. Conahan
Director

GENERAL ACCOUNTING OFFICE
REPORT TO THE SECRETARY
OF THE AIR FORCE

AIR FORCE USES INACCURATE PRODUCTION LEADTIME TO COMPUTE SPARE PARTS REQUIREMENTS

D I G E S T

The Air Force Logistics Command, through its five air logistics centers, buys and stocks spare parts and supplies to support Air Force weapons systems. The centers compute stock levels and material requirements four times a month for consumable items. Production leadtime is an important factor used to determine when items must be ordered so they will be received before existing stocks are depleted. GAO made this review to determine whether the Air Force was using current and accurate production leadtimes to compute requirements for consumable items and whether long leadtimes could be reduced.

GAO analyzed a random sample of items being managed at the Oklahoma City and San Antonio logistics centers. These items had leadtimes exceeding 360 days and annual demands of $5,000 or more. These were selected because (1) they represent most of the expenditures for consumable items, (2) they receive the most management attention, and (3) their long leadtimes substantially increase requirements. GAO analyzed in detail the production leadtimes used in determining requirements at the two centers and obtained detailed leadtime data from 84 contractors.

OUTDATED AND INACCURATE PRODUCTION LEADTIMES USED TO DETERMINE REQUIREMENTS

The two logistics centers overstated requirements for many consumable parts by an estimated $137.5 million and understated requirements for others by about $12 million. Also, they were unnecessarily stocking an estimated $16.7 million worth of parts as safety level material with annual holding costs of $2.9 million. GAO believes that the primary reason for the invalid requirements determination was the use of outdated leadtime data in computing requirements. (See p. 4.) GAO believes that the centers were not using up-to-date leadtimes because (1) regulations do not require them to periodically obtain timely leadtime data from contractors and (2) management practices encourage the use of long leadtimes as a buffer to avoid shortages.

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Tear Sheet

For example, at one center, officials advised item managers to consider the contractors' revised leadtime data only if it increased the leadtime. Decreases, which would result in stocking fewer items, were to be ignored. (See p. 9.)

The impact of using overstated leadtimes is illustrated by the following examples.

--In August 1982, the contractor's leadtime of 233 days was on file at the San Antonio center. To compute requirements, however, the center used an outdated leadtime of 854 days, which the contractor had provided in August 1979. By not using the latest data available, the center overstated requirements by 153 items, or $1,841,580. (See p. 10.)

--In August 1982, the contractor's leadtime for one of GAO's sample items was 495 days. However, the Oklahoma City center used an outdated leadtime of 901 days, causing requirements to be overstated by 5,389 items, or $206,021. Also, the safety level was overstated by 1,305 items, or $48,890. Annual recurring holding costs for this unnecessary inventory are $7,484. (See p. 5.)

Although the centers recognize that long leadtimes can result in additional inventory investment and readiness problems, only limited efforts have been made to reduce leadtimes. (See p. 14.)

LIMITED ACTIONS TAKEN TO IMPROVE MANAGEMENT OF LONG LEADTIME ITEMS

Several contractors were providing the Air Force with inaccurate data by (1) including in their proposed leadtimes inappropriate standards and contingency factors and (2) not recognizing that many raw materials were already on hand or on order, thus reducing the time required to actually deliver the items. By using these excessive leadtimes to compute requirements, orders are placed early, contractors deliver ahead of schedule, and inventories are increased. For example:

--The San Antonio center ordered 30,020 items using an excessive leadtime provided by one company, which then delivered the parts about 16 months early. Since the parts were added to the San Antonio center's inventory long before they were needed, the center's procurement funds totaling $1.6 million were prematurely spent and holding

costs were increased about $408,000. (See p. 17.)

--One contractor included an unnecessary contingency allowance of 88 days in its 615-day leadtime, increasing the San Antonio center's requirements by about $54,000. (See p. 15.)

--Another contractor included a standard 61 days of administrative leadtime for 11 sample items. The contractor's actual administrative time ranged from 12 to 237 days. (See p. 15.)

In GAO's opinion, logistics center personnel have not made sufficient use of Government representatives who have knowledge of and access to contractor operations and conditions which affect production leadtimes. GAO also believes that logistics center personnel have very little knowledge of the elements making up contractors' proposed leadtimes. (See pp. 16, 18, and 19.)

GAO believes, therefore, that center personnel should be working more closely with contractors and Government representatives at contractors' plants to (1) identify and resolve conditions which result in inaccurate leadtimes and (2) recognize changing conditions which affect these leadtimes. (See p. 20.)

RECOMMENDATIONS

GAO recommends that the Secretary of the Air Force direct the Commander, Air Force Logistics Command, to implement improved procedures and controls to insure that appropriate production leadtimes are maintained at the logistics centers. Such procedures and controls should insure that center personnel:

--Periodically obtain and use leadtime updates from contractors on items with long production leadtimes and high annual demands.

--Limit the use of historical data to forecast leadtimes for items to times when current updates cannot be obtained from contractors.

--Stress the importance of up-to-date and accurate leadtimes and monitor logistics center progress in correcting outdated and inaccurate data.

GAO also recommends that the Secretary direct the Commander to require logistics center personnel to:

--Work more closely with contractors to identify and resolve conditions such as contingency factors and administrative leadtime standards which result in excess production leadtimes being used to compute requirements.

--Coordinate with Air Force plant representatives and Defense Contract Administration Services Management area offices in working with contractors to reduce long production leadtimes used in computing requirements.

--Accept advance deliveries only when advantageous to the Air Force.

AGENCY COMMENTS

The Air Force generally agreed with GAO's position that logistics centers need to improve procedures and controls to insure that appropriate production leadtimes are maintained. However, in GAO's opinion, some Air Force comments on a draft of this report were not responsive to the situations discussed and did not recognize the practices being followed at the logistics centers. (See pp. 11 to 13.)

Contents

ABBREVIATIONS

AFLC	Air Force Logistics Command
EOQ	economic order quantity
GAO	General Accounting Office

CHAPTER 1

INTRODUCTION

The mission of the Air Force Logistics Command (AFLC) is to provide logistics support to insure that Air Force weapons systems are kept at maximum operational capability at the least possible cost. AFLC carries out its responsibilities at its headquarters at Wright-Patterson Air Force Base, Ohio, and at five air logistics centers. These centers have computerized systems for determining requirements for reparable and consumable spare parts. Item managers decide which item to buy, retain, or dispose of based on data provided by these systems.

This report concerns production leadtimes used by AFLC's requirements system for consumable items in the system support stock fund--the Economic Order Quantity (EOQ) Requirements Computation System. As of September 30, 1982, the five centers were managing over 398,000 active consumable items valued at $2.7 billion. The Oklahoma City and San Antonio centers were managing about 97,000 and 157,000 consumable items valued at $753 million and $825 million, respectively.

The Air Force defines "production leadtime" as the time between the date of contract or purchase order award and the receipt of the first significant delivery quantity (under normal delivery conditions). "Significant delivery" is defined as at least 10 percent of the total contract or purchase order quantity. Item managers are responsible for the accuracy of and the use of production leadtimes. Procurement officials also receive production leadtime estimates directly from contractors. In updating the system, item managers are supposed to use the most current information available. This can be in the form of the most recent scheduled delivery, the most recent actual delivery, or the most recent contractor estimate.

The computerized EOQ Requirements Computation System computes stock levels and requirements for all system support stock fund items. It is run four times a month and is supposed to be based on the most current data. Production leadtime for each item is included in the system. Leadtime length determines when items must be ordered so they will be received before existing stocks are depleted.

Overstated production leadtimes result in determining the need for too many items. In such cases, procurement funds could be prematurely obligated and invested in unneeded items. Understated leadtimes result in determining the need for too few items. In such cases, centers wait too long before ordering additional parts. Inventory shortages which result may adversely affect the readiness of units needing the parts.

Production leadtime also affects the amount of safety level stocks the Air Force will carry to cover unexpected requirements and slippage of contractor delivery schedules. Generally, the longer the leadtime, the higher the safety level will be. Therefore, in addition to causing excessive inventory levels, overstated leadtimes increase inventory holding costs and can result in the procurement of parts that will never be used.

OBJECTIVES, SCOPE, AND METHODOLOGY

Our objectives were to determine (1) whether the Air Force was using the most current and accurate production leadtimes available to compute requirements for consumable items and (2) whether long production leadtimes could be reduced.

We reviewed Air Force policies, procedures, and practices used at the Oklahoma City and San Antonio air logistics centers for updating and using production leadtimes. We also interviewed AFLC and center officials responsible for carrying out these activities and made computer analyses to select random samples.

We obtained computer tapes from two centers covering the requirements for all consumable items managed by the Oklahoma City center as of September 30, 1981, and the San Antonio center as of December 31, 1981. We analyzed the tapes and identified 4,928 Oklahoma City items and 3,438 San Antonio items that had production leadtimes exceeding 360 days and annual demands of $5,000 or more. We selected these items as our universe because (1) they account for most of the expenditures made by the centers for consumable items, (2) they receive the most management attention, and (3) their long production leadtimes substantially increase requirements. We randomly selected 146 Oklahoma City items and 111 San Antonio items, or a total of 257 items from the refined universe. The strata from which our sample was selected are shown in appendix I.

The system for computing requirements for system support stock fund items (DO62 system) automatically receives input from several subsystems (AFLC Retail Stocks Control and Distribution Locator System--DO33 system, Acquisition and Due-In System Requirements Computation--JO41 system, etc.). We considered it impractical to analyze each subsystem to determine the reliability of data obtained from the DO62 system. As an alternative, we determined that our universe data generally agreed with Air Force EOQ requirements inventory analysis reports for September 30 and December 31, 1981. For example, the Oklahoma City center tapes showed that the variance between the number and inventory value of consumable items managed and the requirements inventory analysis report for September 30, 1981, was less than one quarter of 1 percent. Also, we interviewed item managers and supervisors responsible for each of the 257 items reviewed, and they confirmed the accuracy of our sample data.

The 257 sample items were supplied by 90 contractors. We visited 48 contractors and telephoned 36 more to obtain a detailed breakdown of the time required in the production process, such as the time required to obtain raw materials, forgings, etc. We did not obtain this breakdown from the remaining six contractors because we deleted the items they had supplied from the sample. The reason for the deletions was that the management of the items had been transferred to the Defense Logistics Agency.

We obtained current production leadtimes from the last contractors based on the purchase of an Air Force EOQ for each sample item and compared them with the production leadtimes used to compute requirements in the EOQ Requirements Computation System on May 7, 1982. If the leadtimes included in the system and used in the requirements computation appeared excessive, we determined the impact on future procurements by multiplying the excess leadtime by the daily demand rate and the unit cost for the item. For items with safety levels, we used the Air Force's CREATE 1/ system to recompute the items' safety level using the corrected production leadtimes. To determine the primary reasons for excess leadtimes, we reviewed item manager and contract files and discussed the sample items with center officials. Where leadtimes appeared to be understated, we used the same methodology to calculate shortages.

The requirements objectives for the 4,928 Oklahoma City items and 3,438 San Antonio items reviewed included production leadtime quantities valued at $574 million and $390 million and safety levels valued at $35 million and $25 million, respectively.

Our review was performed in accordance with generally accepted government audit standards. As noted on page 2, we did not verify the validity of the information being fed into the main system by the various subsystems, but, as also noted on page 2, we took steps to insure that we used the same data that the Air Force uses to manage its affairs.

1/A method whereby one can hold certain requirements data constant and change other requirements data to determine how the changed data affects the requirements computation.

CHAPTER 2

OUTDATED AND INACCURATE PRODUCTION LEADTIMES USED TO DETERMINE REQUIREMENTS

Production leadtimes used by the Oklahoma City and San Antonio Air Logistics Centers to determine requirements for spare parts do not realistically reflect the time required to obtain these items. For the most part, leadtimes were overstated, which results in determining a need for too many items. In such cases, procurement funds could be prematurely obligated and invested in unneeded items and unnecessary costs incurred to hold such items. Also, many leadtimes were understated, which results in determining a need for too few items. In such cases, a sufficient quantity of stocks is not being maintained, which could affect the readiness of units needing the items or could result in costly expedited deliveries. Of the 257 items reviewed, we found inaccurate leadtimes for 197 items (77 percent).

For 173 of the items (67 percent) inaccurate leadtimes were used, which resulted in overstating requirements by about $15.1 million. Projecting our sample results (see app. II), we estimate the use of excessive production leadtimes at the two centers has resulted in overstated requirements of $137.5 million, excessive stock safety levels of $16.7 million, and unnecessary annual holding costs of $2.9 million.

Also, for 24 of the sample items (9 percent), inaccurate leadtimes were used, which understated requirements by about $565,000. Projecting our sample results, we estimate that the two centers could have shortages in spare parts totaling $12 million.

In our opinion, these inaccuracies occur because (1) the centers do not periodically and systematically obtain current leadtime data from contractors and (2) item managers do not always use the most current data even when they have it.

NEED TO OBTAIN UPDATED LEADTIME INFORMATION FROM CONTRACTORS

The two centers generally relied on historical leadtime data to compute requirements. This data was based either on the last buy for which delivery had been made or the last contractor quote or estimate. This data is often outdated, and the approach does not recognize that situations change, such as economic conditions, availability of raw material, and fluctuations in plant workload. Factors affecting vendors' past performance may no longer be present, and our review showed this often to be the case.

Several contractors said production leadtimes had dropped significantly in the past 2 years, essentially because commercial aviation demands were down. For example, one contractor told us that, in a 20-month period, leadtime for titanium forgings had dropped from 124 to 65 weeks. Another contractor pointed out that the Air Force procedure that bases many of its leadtimes on historical data causes the Air Force to constantly lag behind what is happening in the marketplace. The contractor noted that, unless the centers update their leadtimes on a more frequent, periodic basis, they will continue making decisions using outdated information.

Use of current periodic updates of production leadtimes would not only help reduce inflated requirements and excessive inventory levels but would more likely insure that stocks were available in a timely manner during a period of expanding economy when leadtimes might be increasing.

The following examples illustrate the impact of using overstated leadtimes in the requirements computation at each center visited and demonstrate the need for more frequent periodic leadtime updates.

--Stock No. 2840-00-872-1034 CN. A production leadtime of 901 days was used to compute requirements in August 1982. The leadtime was based on data provided by the contractor in February 1982 and was the most current information available to the item manager. Our discussions with the contractor, also in August 1982, disclosed that, because of reduced commercial business, the production leadtime had fallen to 495 days. By using the outdated leadtime, the Oklahoma City center's requirements were overstated by 5,389 items valued at $206,021. Also, the center's safety level for this item was excessive by 1,305 items, or $48,890. Annual recurring holding costs for this excess inventory are $7,484. The contractor, which provides leadtime data semiannually to the center, told us that it has offered to give the center leadtime data every 2 months but that center officials said they did not want it more often than twice a year. Center officials did not take corrective action and stated that the 901-day leadtime would be used until the contractor provided a later update.

--Stock No. 1670-00-529-8712. A production leadtime of 455 days was used to compute requirements in August 1982. The leadtime was based on a contract delivery schedule established on March 16, 1982, and was the most current information available to the item manager. Our discussion with the contractor, also in August 1982, disclosed that the 455-day leadtime was based on the first Government contract the company ever had and required first article approval by the San Antonio

center. The official said the current production leadtime was only 235 days. By using the outdated leadtime, the center's requirements were overstated by 2,586 items valued at $74,244. Also, its safety level stock was excessive by 389 items, or $11,168. Annual recurring holding costs for this excess inventory are $2,010. San Antonio officials did not take corrective action and said they would continue to use the 455-day leadtime. A contractor official said the company would give the Air Force current leadtimes if asked.

To a limited extent, logistics centers recognize that historical leadtime data may be outdated and, therefore, not reliable for computing requirements. Accordingly, the centers try to obtain current data either through annual surveys initiated by the centers or periodic updates which may be initiated by centers or contractors. In our opinion, the annual surveys are ineffective and do not provide credible data. We believe, therefore, that the centers should concentrate more on the periodic updates rather than annual surveys, as discussed in more detail below.

Annual leadtime surveys are ineffective

AFLC Regulation 84-4 provides guidelines to logistics centers for identifying current production leadtimes in requirements computations. The regulation notes that the primary means of determining current production leadtime is by direct written or verbal contact with the sole source or most recent contractor. Logistics center criteria provide for annual leadtime updates for items having over $500 in yearly demands, regardless of production leadtime length, and each center conducts these surveys. In our opinion, the criteria for updating leadtime data need to provide for more frequent, periodic updates, especially for items with long leadtimes and high annual demands. In an earlier report 1/ we concluded that the annual surveys do not result in credible information due to the infrequency of the survey requests and the time it takes the contractors to respond. By the time contractors receive and research the requests and deliver updated leadtimes to the centers, over 6 months may have elapsed and the data may be outdated.

Another problem with annual surveys stems from the quantity of items included in the survey requests and the fact that centers do not always use the data provided. This has resulted in a somewhat less than cooperative attitude on the part of contractors.

1/"Requirements and Production Capabilities Are Uncertain for Some Air Force, Navy, and Marine Corps Aircraft Spares and Repair Parts" (GAO/PLRD-82-77, July 22, 1982).

Some contractors expressed concern that the updates they provide are not used. Officials from one company, for example, stated that they annually provide the centers with production leadtime updates but believe the data is not used because desired Air Force delivery schedules vary sharply with the leadtimes previously provided. Another contractor stated that it provided the Oklahoma City center with updated information for a number of items in June 1982, including three of our sample items. However, the item manager's records showed that the updates had not been used for two of the three sample items.

Two contractors also stated that the centers request updates for too many items which they never buy. Officials at one contractor's plant stated that at one time the Air Force had asked them to supply leadtimes for over 1,200 items, which they did at considerable expense. They said they had tracked these items and found the Air Force had bought only 300 of them during the next year. The officials said the next time the Air force asked for updated leadtimes, they had refused, due to the cost involved.

The difficulties the centers have in obtaining updates for so many items are demonstrated by the results of the annual surveys at the San Antonio center during the last 3 years. As shown below, the center received responses for only a little over half of the items requested. Of equal importance is that the center did not use the data received. As shown below, only 13 to 22 percent of the requested leadtimes were actually updated.

Contractor Responses to San Antonio Production Leadtime Surveys

Year	No. of items sent to contractors	No. of responses	Percent	No. used to update system	Percent
1980	14,421	7,650	53	3,144	22
1981	15,620	8,263	53	2,107	19
1982	12,637	6,712	53	1,695	13

As a supplement to the annual surveys, the centers obtain periodic updates from several major contractors annually, semiannually, quarterly, or monthly. These contractors voluntarily provide leadtime updates, without formal agreements, and sometimes without specific requests from the Air Force. In our view, this approach would provide more timely data and would minimize the impact of inflated requirements and inventory shortages, particularly for items with long production leadtimes and high annual demands. The potential adverse effect of outdated leadtimes is most significant on such items.

More periodic updates are needed and should be used

Many of the larger contractors said they update production leadtimes on their items frequently--weekly, monthly, quarterly, or as changes occur. They stressed the importance of accurate leadtimes and said that frequent updating improves efficiency in scheduling plant workload and minimizes inventory investment. They further stated that frequent updating is a normal industry practice.

Officials for one company told us that while they give logistics centers updates annually, they update their own system weekly. They also stated that they provide quarterly updates to the Navy and semiannual updates to the Army. They said they would provide the air logistics centers more frequent updates if needed.

These officials further told us that at one time they gave centers annual updates on 16,000 engine parts. Since this required considerable effort, the contractor surveyed its Government customers to determine whether these updates were being used. There was no response from the air logistics centers, so the company reduced the number of updates to the 900 items now provided.

Several contractors told us they do not provide regular periodic updates simply because they have not been asked to. Officials at one company said they do business with both the San Antonio and Warner Robins centers. They said that they provide quarterly updates to the Warner Robins center and that they could readily provide quarterly updates to the San Antonio center but have not been asked to.

MANAGEMENT PRACTICES ENCOURAGE USE OF OVERSTATED LEADTIMES

As previously noted, item managers often do not always use current data, even when they have it. The type of data generally ignored by item managers is that which shows a reduction in production leadtime and which would result in computing requirements for fewer items and maintenance of lower stock levels. Comments generally expressed by item managers were that they would rather have too much stock on hand than take the chance of running out. As noted on page 4, in 173 of the 257 sample items (67 percent), they were stocking too much--over $15 million too much.

In our opinion, this situation has resulted from a general lack of emphasis on the part of the logistics centers' management to insure that optimum stock levels are maintained at the lowest possible cost. Officials at both centers stated that they rely on item managers to use good judgment in determining when production leadtime--shown in the system--should be changed

to reflect contractor-provided updates. They also echoed the item managers' philosophy of stocking to make sure they do not run out.

The practice of not reducing production leadtime is also recognized by the centers' management and is the stated policy of the San Antonio center. For example, in an October 8, 1982, memorandum, in which the Director of Materiel Management commented on the results of a review of some of our sample items, he stated that:

> "The GAO survey parallels the annual production lead time survey prescribed by AFLCR 84-4, which historically has produced meager results. The total number of production lead time changes filed maintained [sic] in 1981 represented only 20% while only 13% were used from the 1982 survey. This is a very poor success rate. An analysis of past two years survey revealed that vendors tend to decrease leadtimes because they think it would enhance their opportunity for a further contract award. Our policy in the past, therefore, has been to advise IMs [item managers] to use only increased leadtimes, if appropriate." (Underscoring added.)

In our opinion, the percentages provided here, and the comment that they indicate a poor success rate, do not adequately address the situation and are misleading. As shown on page 7, these percentages refer to the number of items for which the system was updated, in relation to the number of items for which updates were requested. In our view, a more appropriate approach would have been to determine what percentage of responses received were actually used to update the system. For example, in 1982, 6,712 responses were received. (See p. 7.) Of these,

--3,933 indicated a need to increase the leadtimes,
--1,965 indicated a need to decrease the leadtimes, and
--814 indicated no change was required.

Thus, the responses received indicated the need to update the system for 5,898 items. But only 1,695 items (29 percent) were updated. The comment that vendors may be reducing their leadtimes to enhance their opportunity for a future award also does not adequately address the situation. Of the 111 sample items selected from the San Antonio center, 87 (78 percent) were purchased from sole-source contractors. Such a situation does not, in our opinion, support the position that vendors reduce leadtimes to get future awards.

While the centers' policies and practices may do well to preclude running out of stock, they do not insure optimum stockage at the least possible cost. For example, on just two items, application of this philosophy resulted in over $3.2 million of overstated requirements.

--Stock No. 5841-00-415-2934 LH. A production leadtime of 854 days was used to compute requirements on August 12, 1982. This leadtime was based on the actual delivery time of an August 1979 contract. On a later contract, dated August 25, 1981, the contractor advised San Antonio officials that the production leadtime was only 233 days. In August 1982, the contractor told us that leadtime for this item was still 233 days. Had the item manager used the most recent data available, the leadtime would have been accurate. However, the outdated longer leadtime was used and the requirements were overstated by 153 items, valued at $1,841,580. In November 1982, we discussed this with the item manager, who agreed to change the production leadtime in the system to 233 days. However, our followup on January 19, 1983, disclosed that no change had been made.

--Stock No. 2840-00-867-6279 RX. The contractor for this item gave the San Antonio center a production leadtime estimate of 1,110 days in January 1981 and updated it to 708 days in January 1982. The item manager chose not to use the update because the leadtime had decreased. The 1,110-day leadtime was still being used as of August 7, 1982. In August 1982, the contractor told us the leadtime was still 708 days. As a result, requirements were overstated by $1,364,183. Center officials agreed that they should have used the more current data and advised us by letter dated October 28, 1982, that the item manager had revised the leadtime to 708 days. However, our followup on January 19, 1983, disclosed that no change had been made.

OTHER EFFECTS OF OUTDATED PRODUCTION LEADTIMES

The effect of outdated and inaccurate leadtimes is not restricted just to the requirements determination process. It also extends to the budget formulation process. Each year, the centers use the March 31 computation of requirements to prepare their budget requests for the system support stock fund. Therefore, the entire $137.5 million of inflated requirements from the Oklahoma City and San Antonio centers were included in the request for apportionment of obligational authority, which was granted. For fiscal year 1982, however, AFLC reduced the two centers' system support stock fund obligational authority by $199 million and notified them that they would receive a similar reduction for fiscal year 1983. These reductions were made because there was an overall shortage of funds in the system support stock fund and not because AFLC or either center had recognized the overstated requirements. Use of updated production leadtimes at these centers, however, could significantly reduce the impact of the reduction.

All air logistics centers are supposed to be guided by uniform policies issued by AFLC and all centers use the same supply management computer systems. If the conditions at the Oklahoma City and San Antonio centers exist at the other three centers, the requests for fiscal year 1984 funds could be inflated by many millions of dollars.

CONCLUSIONS

The Air Force can substantially reduce inventories and obligations by using up-to-date accurate producion leadtime data to compute requirements. In most cases, problems occur because the air logistics centers do not obtain and use frequent, periodic production leadtime updates from contractors. In other cases, item managers ignore data at hand which would help correct the problems. More aggressive management action is needed at all levels in the AFLC to insure that the centers and, in turn, the item managers obtain and use the most accurate and current leadtimes available.

AFLC should use up-to-date and accurate production leadtimes at the Oklahoma City and San Antonio centers to insure that inventory investment is limited to the level needed to support mission requirements. AFLC should determine whether outdated and inaccurate leadtimes are being used at the other three centers and, if so, take corrective action.

RECOMMENDATIONS

We recommend that the Secretary of the Air Force direct the Commander, AFLC, to implement improved procedures and controls to insure that appropriate production leadtimes are maintained at the air logistics centers. Such procedures and controls should insure that center personnel:

--Frequently and periodically obtain and use leadtime updates from contractors on items with long production leadtimes and high annual demands.

--Limit the use of historical data to forecast leadtimes for items to times when current updates cannot be obtained from contractors.

--Stress the importance of up-to-date and accurate leadtimes and monitor logistics center progress in correcting outdated and inaccurate data.

AGENCY COMMENTS AND OUR EVALUATION

The Air Force agreed that it has not requested updated leadtime data more frequently than annually and that the quotes should be obtained more frequently. It agreed that annual leadtime surveys are ineffective and stated that it plans to revise its leadtime survey system.

The Air Force also agreed that the centers (1) rely on production leadtime which is often outdated and (2) do not recognize changes resulting from raw material availability or changes in plant workload. The Air Force stated that it plans to develop a coding procedure to identify items for which leadtime is subject to change because of material content or specialized manufacturing process.

In commenting on our conclusion that management practices encourage the use of overstated leadtimes, the Air Force did not concur, stating that Air Force policy does not encourage the use of overstated leadtimes. In our opinion, this statement is not responsive to the situation described in the report. As noted throughout this chapter, actual practices at the logistics centers differ from the Air Force stated policy. Also, as noted on page 9, the Director of Materiel Management at the San Antonio center described that center's policy as having item managers recognize contractor input only if it results in increased leadtimes.

Concerning leadtime data we obtained from contractors and contractors' statements on leadtimes, the Air Force merely noted them, stating that they could not be verified. In our opinion, this is not responsive and we do not agree that such data could not be verified. After our visits to the contractors, we provided the logistics centers with data we obtained for all sample items. The centers could verify this data simply by contacting the contractors. Personnel at the Oklahoma City center did that on 40 of our sample items. Of these, five leadtimes were the same as that which we had obtained. For the other 35, the leadtimes had changed since our visit. For 33 items, the leadtimes were even less than what we had obtained, and two were greater. In our opinion, this further demonstrates that leadtimes can and do change rather quickly and further supports our position that the centers should frequently update them.

It should be noted that in all 40 cases, the leadtimes provided by the contractors were less than those being used by the center to compute requirements. However, the center updated its files for only 28 of these, including the 2 for which leadtimes had increased.

In commenting on our general position that the centers use inaccurate production leadtime to compute requirements, the Air Force only partially agreed. It stated that logistics centers use the most current recent available leadtime, providing it is realistic. The basic problem then is, "What do center personnel consider realistic?" For the most part, it appears that current data is viewed as being unrealistic if it should result in shorter leadtimes than is currently being used by the centers. As noted above, Oklahoma City center personnel did not completely update their files after having been provided more current data and, as noted earlier, San Antonio center personnel follow a similar practice.

The Air Force concurred with our recommendation to improve procedures and controls to insure that appropriate production leadtimes are maintained at the logistics centers. However, it did not agree that such procedures should include using historical data only when current updates could not be obtained. In disagreeing with this, the Air Force merely noted that quotes should not be used unless they are realistic. This comment appears out of place because we are not recommending the use of unrealistic data. Rather, we are recommending that the centers obtain, and use, current data. We found that historical information will always lag behind what is happening in the marketplace. Thus, we recommend more frequent updates. To amplify this, we believe the updates should be at least quarterly for items with long production leadtimes (over 1 year) and with annual demands of $5,000 or more.

CHAPTER 3

LIMITED ACTIONS TAKEN TO IMPROVE MANAGEMENT OF LONG PRODUCTION LEADTIME ITEMS

Despite the ineffective practices discussed in chapter 2, the logistics centers recognize that long production leadtimes result in excessive inventory levels and can cause premature obligation of funds. The Air Force has taken some action in an attempt to reduce leadtimes, including buying some parts in a semifinished state and concentrating on critical items for which the contractors are delinquent. While these actions may help reduce leadtimes for some items, we believe the centers should also be working more closely with

--contractors to identify and resolve conditions which result in unrealistic leadtimes and

--Government representatives at contractor plants to stay abreast of leadtime experience and to identify changing leadtime conditions.

NEED TO IDENTIFY AND RESOLVE CONDITIONS WHICH RESULT IN UNREALISTIC PRODUCTION LEADTIMES

Contractors' leadtimes are made up of several factors, such as time required for obtaining raw materials and for machining and assemblying. A determination of whether proposed leadtimes are realistic would, in our opinion, require some knowledge of the time needed for these elements. Item managers at the Oklahoma City and San Antonio centers do not have such information and do not have procedures for working with contractors to obtain it.

In discussions with contractors on selected items, we obtained leadtime data on these elements and identified questionable practices which, in our opinion, item managers should be aware of. We found, for example, that (1) contractors proposed leadtimes that included standards and contingency factors which were inappropriate and (2) contractors have material on hand or on order before award of the contracts, but do not give the Air Force benefit of the resultant reduced leadtimes.

While conditions identified are not purported to exist at all contractors' plants, we believe they indicate item managers' general lack of knowledge of leadtimes required for the elements and demonstrate the need for centers to work more closely with contractors to obtain realistic leadtimes.

Inappropriate standards and contingency factors included in contractor leadtimes

Production leadtimes proposed by many contractors include a standard number of days as administrative leadtime and additional days for contingencies. Leadtime for 124 of the 257 items in our sample (48 percent) included either a standard for contractor administrative leadtime or a contingency factor. In many cases, the number of days included for these factors is inappropriate and the centers should be assessing their validity because of their impact on the quantity of items stocked.

Standard administative leadtime

Contractor administrative leadtime is the time required by the contractor to either start production or subcontract for the item. Contractors generally agreed that actual administrative leadtimes varied for different items, depending on whether an item is produced in-house or production of it is subcontracted. Contractors also stated that actual administrative leadtimes for some items were consistently less than the standard while others were greater.

We did not try to analyze the contractors' administrative leadtimes. However, we did identify instances at one contractor's plant when actual time varied significantly from the standard time. At this plant, the contractor had provided 11 of the items in our sample and had included, in the total leadtime, 61 days as standard administrative leadtime. Actual time ranged from 12 to 237 days.

By merely accepting the standard number of days as part of the total producion leadtime, the Air Force runs the risk of not only overstocking items if the standard is too high but also understocking items if it is too low.

Contingency factors

Several contractors that supplied items selected as our sample included a contingency factor to cover unexpected delays. For example, one contractor's leadtime of 615 days (for item stock number 2835-00-133-0245) included 88 days for contingencies. This increased the San Antonio center's computed requirements by $54,000. Another contractor's leadtime of 405 days (for item stock number 1650-00-187-1371) included 60 days for contingencies and increased the computed requirements by $4,800.

The reason for the contingency factors, as noted above, is to cover unexpected delays. In our opinion, this is not necessary because delays in contractor delivery schedules are one of the principal reasons that the logistics centers compute and

maintain safety levels of spare parts. Safety levels are generally computed for items with fluctuating demands, long leadtimes, and low unit costs (usually under $100). Of the 275 items sampled, 86 (33.5 percent) had computed safety levels. As of September 30, 1982, the two centers reviewed were maintaining safety level stocks of over $130 million.

Another reason contingency factors should not be included as part of production leadtime is the provisions of AFLC Regulation 57-6. This regulation defines "production leadtime" as the period between the date of contract and delivery under normal delivery conditions and notes that unusual circumstances of a one-time nature should be disregarded. In our opinion, unexpected delays would be other than normal delivery conditions, and including contingency factors for such delays conflicts with the regulation. We believe, therefore, that the logistics centers should neither accept nor use in the requirements computation the time included in production leadtimes for contingencies.

However, as noted earlier, we also believe that center personnel have very little knowledge of the elements making up the production leadtime and, therefore, probably were not aware of these contingencies. Working more closely with the contractors would, in our opinion, enable them to obtain that knowledge.

Need to recognize leadtime reduction when components are on hand or on order

For many of our sample items, the principal factor contributing to long production leadtime was the time required to obtain raw materials or semifinished components, such as forgings or castings. Some contractors visited make their own forecasts of Air Force procurements and, in some cases, advance order long leadtime materials and components. When the Air Force orders the item, the contractor can then deliver more quickly than if it had waited until the order was received before ordering the raw material or semifinished component.

Advance ordering reduces the time between the Air Force contract date and the item's delivery date. Contractor reaction was mixed on whether the Air Force should benefit from the reduced leadtime. Some contractors advise the Air Force of the reduced leadtime; others do not. One contractor, for example, had reduced the production leadtime by 28 weeks--from 94 to 66 weeks--on stock number 2915-00-242-9600 PQ by ordering in advance the bearing needed to make the part. The contractor gave the logistics center the reduced leadtime for use in computing requirements.

At another major contractor's plant, officials stated that it was company policy to stock long leadtime raw materials and that this resulted in shorter production leadtime. However, the

contractor does not give the centers the reduced leadtime because it said company policy could change. Under these circumstances, the actual leadtime is much less than that anticipated by the Air Force and has resulted in the centers getting delivery of the items much faster than needed. For example, company officials said they gave the San Antonio center a 70-week production leadtime estimate for spare parts even though by advance ordering raw materials, they are able to deliver the parts in 35 weeks. For the items in our sample, this company generally delivered early, often several months to more than 2 years early. Consequently, the centers were carrying excessive inventories.

This company was the contractor for 16 of our sample items. Inventory on hand for the 16 items totaled nearly $34 million. In May 1982, the centers had $17.8 million of these items in excess of the optimal stockage level. 1/ Annual holding costs for this excessive inventory are about $2.9 million.

Following are examples of the increased costs that resulted because the centers did not recognize that the contractors had advance ordered materials and components and would deliver the parts early.

--Stock No. 2840-00-908-0567 RX. A contract for 30,020 items, awarded in October 1980, specified delivery dates from April through December 1982. However, the contractor's policy of advance ordering the raw materials and components enabled delivery to be completed in August 1981, about 16 months early and about 8 months before the first shipment was due. Also, the company delivered over 1 year ahead of schedule on the most recent contract for this item awarded in April 1981. Since the items were added to the San Antonio center's inventory long before they were needed, the center's procurement funds totaling $1.6 million were prematurely spent and holding costs were increased by about $408,000.

--Stock No. 2840-00-239-1253 RX. A contract for 777 items, awarded in October 1980, specified monthly deliveries from October 1982 through March 1983. However, the contractor's policy of advance ordering the raw materials and components enabled the contractor to deliver all 777 between December 1980 and June 1981, about 21 months ahead of schedule and 16 months before the first shipment was due. Since the items were added to the San Antonio center's inventory long before they were needed, the center's procurement funds of $769,463 were prematurely spent and holding costs were increased by about $256,000.

1/We computed this level using the logistics centers' requirements for war reserve material, depot supply levels, safety levels, quantitative requirements, and EOQs.

As evidenced by the fact that some contractors advise the Air Force of reduced leadtimes resulting from advance ordering, we believe it reasonable that the Air Force try to work with other contractors to obtain similar benefits. Some contractors stated they would be willing to make advance purchases and give the Air Force the reduced leadtimes, if the Air Force would give them procurement forecast information. If this approach is unsuccessful, the Air Force should refuse early deliveries.

AFLC procurement regulations provide that contracts may specify whether early delivery is acceptable. This determination is supposed to be based on whether early delivery is advantageous to the Government. The policy at the two centers is to routinely specify that early delivery is acceptable.

Our review of the most recent contracts, on which delivries had been made for the 257 items selected as our sample, disclosed that 148 (58 percent) had been delivered early.

Some contractors said their commercial customers generally did not accept early deliveries, and one contractor official said his company would not accept early delivery from its vendors. He said that since vendors knew they would not be allowed to deliver early, they quoted realistic leadtimes rather than leadtimes that included a lot of padding.

We believe the logistics centers should adopt a similar policy.

NEED TO WORK MORE CLOSELY WITH GOVERNMENT REPRESENTATIVES AT CONTRACTOR PLANTS

For most major contractors doing business with the Federal Government, the Department of Defense has representatives assigned who have knowledge of the contractors' operations and are responsible for protecting the Government's interests. While much of the information available to these representatives would benefit the Air Force, logistics center personnel have not taken advantage of it.

Defense Contract Administration Services area offices perform contract administration services within designated geographic areas and at specified contractor plants. These services include preaward surveys, quality assurance, engineering support, financial services, production surveillance, and contract administration. Area offices are responsible to the contracting military service for insuring that products and services ordered are provided when and where needed and at the agreed-upon price.

At those plants producing major weapons systems, such as aircraft, tanks, and ships, this function is performed by a plant representative of one of the services. These representatives have knowledge of and access to contractor operations and

conditions which affect production leadtimes and, therefore, are in a position to assist air logistics centers.

For example, during our visits to contractor plants, these representatives directed us to the appropriate contractor personnel and later provided detailed data not available at the time of our visit. In one instance, the representative monitored contractor progress in obtaining a breakout of leadtime components and summarized this information in a letter for our use. Contract administration officials told us that although they had access to leadtime information, they generally did not provide it to the logistics centers.

Contract administration officials knew about the shorter leadtime for titanium forgings discussed in chapter 2, but had not passed this information to the centers. These officials further told us they generally did not report leadtime information to the centers unless there was a contract delinquency or the item was critically needed.

In our opinion, the duties of contract administration agencies include monitoring production leadtimes and providing feedback to the logistics centers. However, these agencies cannot do this effectively unless the centers work more closely with them. Contract administration services officials agreed that they were in a position to help centers identify conditions that enable contractors to deliver early or cause them to be late. They further agreed that better coordination between their agencies and centers could help improve the management of long leadtime items.

CONCLUSIONS

Although the Air Force recognizes that long production leadtimes can adversely affect inventory management, it has done little to improve the situation. Contractors include in their proposed leadtimes unrealistic standards for administrative functions and unnecessary contingency factors, both of which affect the accuracy of requirements computation.

Also, some contractors have raw materials on hand or on order when the Air Force awards a contract. This results in shorter production leadtime than would be required if the contractor ordered the material after receiving the contract. But the Air Force does not benefit from this reduced leadtime. To the contrary, this situation had worked to the detriment of the Air Force in that these contractors deliver the items long before they are needed--some as much as 2 years early. This results in excessive stockage levels and unnecessary holding costs.

The centers should be working more closely with contractors to recognize the makeup of proposed leadtimes and to insure that the total proposed leadtimes are realistic. When contractors

already have raw materials on hand, the Air Force should try to obtain reduced leadtime. If this approach is unsuccessful, the Air Force should not accept early delivery when this practice results in stocks on hand exceeding optimum stockage levels.

The centers should also be working more closely with Government representatives at contractors' plants to stay abreast of changing leadtime conditions. While these representatives may be aware of changing conditions, the data is not routinely provided to the logistics centers.

RECOMMENDATIONS

We recommend that the Secretary of the Air Force direct the Commander, AFLC, to require the air logistics centers to:

--Work more closely with contractors to identify and resolve conditions such as contingency factors and administrative leadtime standards that result in excessive leadtimes being used in requirements computations.

--Coordinate with Air Force plant representatives and Defense Contract Administration Services Management area offices in working with contractors to reduce long production leadtimes in the requirements computation when possible.

--Accept advance deliveries only when advantageous to the Air Force.

AGENCY COMMENTS

On discussions relating to contractor statements and elements making up production leadtime, the Air Force merely noted them, stating they could not be verified. In our opinion, this is not responsive and we do not agree that the information could not be verified. As previously noted, the centers could verify this information simply by contacting the contractors.

The Air Force agreed with our conclusions and recommendation on accepting advance deliveries and on the need to work more closely with contractors and Government representatives at contractors' plants. However, the Air Force did not provide specifics on its plans to do this.

STRATIFICATION USED IN SAMPLES OF LONG LEADTIME CONSUMABLE ITEMS AT OKLAHOMA CITY AND SAN ANTONIO AIR LOGISTICS CENTERS

	Oklahoma City center		San Antonio center	
Total consumable items in EOQ Requirements Computation System	97,650		157,168	
GAO universe (production leadtime exceeding 360 days and annual demands exceeding $5,000)	4,928		3,438	
GAO sample strata:	Universe	Sample	Universe	Sample
Production leadtime of 361 to 720 days and $1 million or more in inventory	33	17	[a]/22	11
Production leadtime of 361 to 720 days and inventory of less than $1 million	4,521	60	3,052	50
Production leadtime of 721 to 1,080 days	365	60	[b]/324	30
Production leadtime exceeding 1,080 days	9	9	40	20
Total	4,928	146	3,438	111

[a]/In the samples for the San Antonio center, the first strata also included the items with production leadtimes of 721 to 1,080 days if the items had $1 million or more in inventory.

[b]/Excludes San Antonio items with over $1 million in inventory which were included in the first strata. (See note a.)

ESTIMATED EFFECT OF USING OUTDATED PRODUCTION LEADTIMES

Type of effect	Sample	Projected to universe	Estimated range at 95-percent confidence level Low	High
Inflated requirements	$15,076,774	$137,496,621	$59,230,144	$215,763,098
Excessive safety level stock (note a)	584,383	16,654,940	2,792,224	30,517,656
Excessive holding costs for safety level stock (note b)	99,236	2,922,763	462,802	5,382,724
Inventory shortages	564,860	12,025,981	1,564,392	23,789,513

a/Based on the safety levels used at the two logistics centers, less the revised safety levels using updated production leadtimes. See p. 3 for further discussion on computation.

b/Holding costs were computed based on the application of an AFLC-provided factor (percent of inventory costs). These factors vary by logistics center. At the Oklahoma City center, the factor was 16 percent; at the San Antonio Center, 18 percent.

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