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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

BY THE U.S. GENERAL ACCOUNTING OFFICE

# Report To The Secretary Of The Army

AD A108272

① LEVEL II

## The Army Should Improve Its Requirements Determination System

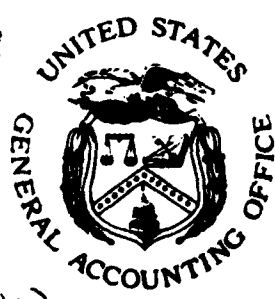
This report discusses needed actions by the U.S. Army to improve its requirements determination system.

GAO found that the Army Missile Command misstated requirements for items in a buy position in August 1980 by \$13 million because of inaccurate, unrealistic, and arbitrary lead-time data.

GAO also identified other requirements areas needing improvement and made specific recommendations to the Secretary of the Army to make the requirements determination system more accurate and credible, make better use of resources, enhance equipment availability, and avoid inventory investments beyond real needs.

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

PROCUREMENT, LOGISTICS,  
AND READINESS DIVISION

B-205309

The Honorable John O. Marsh, Jr.  
The Secretary of the Army

Dear Mr. Secretary:

This report discusses your Department's requirements determination system and recommends ways to make the system more accurate and credible.

We discussed a draft of this report with Army officials and have incorporated their comments, as appropriate, throughout the report.

The report contains recommendations to you on pages 7, 13, and 16. As you know, section 236 of the Legislative Reorganization Act of 1970 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 the 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 the report.

Other specific issues that affect the Army's requirements determination system are discussed in a separate report to the Secretary of Defense, which contrasts and compares the services' requirements determination processes.

We are sending copies of this report to the Director, Office of Management and Budget; the Chairmen, House Committee on Government Operations, Senate Committee on Governmental Affairs, and House and Senate Committees on Appropriations and on Armed Services; and the Secretary of Defense.

Sincerely yours,

A handwritten signature in cursive script that reads "Donald J. Horan".

Donald J. Horan  
Director

D I G E S T

→ The Army Missile Command is the central buyer and supplier of missile equipment and components. The Command manages 56,300 items with an inventory value of about \$436.1 million. In fiscal year 1981, the Command planned to buy about \$274 million of stock items.

WHY THE REVIEW WAS MADE

- ▷ GAO made this review to evaluate the Army's requirements determination system and to determine whether the requirements were based on valid data and needs.
- ▷ In view of the Reagan Administration's plan to increase Defense spending and the expectation that the services will receive full funding in fiscal year 1982, it is imperative that such funds be applied where they are most needed.
- ▷ Some of the information contained in this report is also contained in a separate GAO report to the Secretary of Defense, which contrasts and compares the services' requirements determination processes.

WHAT THE REVIEW SHOWED

GAO found that the Army Missile Command's requirements computations for August 1980 were overstated by \$12.6 million for certain items and understated by about \$400,000 for other items because requirements computations were based on inaccurate delivery, administrative, and production leadtimes. In addition, leadtime requirements were overstated because of the method used to determine requirements for items requiring first article testing.

Although GAO performed the review at only one Army location, the nature of the findings, coupled with the Army's use of a standardized requirements determination system could indicate systemic requirements problems at the other Army inventory management activities.

GAO believes that more accurate requirements would allow the Army to make better use of resources, enhance availability of equipment, and avoid investment in inventory beyond real needs.

#### EXCESSIVE DELIVERY LEADTIME

GAO's review showed that the Missile Command overstated its August 1980 requirements by \$1.3 million because of excessive delivery leadtimes. The Missile Command added 30 days' leadtime to each item for delivery from the manufacturer to the Army when, in fact, delivery leadtime is about 11 days. (See pp. 3 and 4.)

#### DEVIATION FROM PRESCRIBED LEADTIME FORECASTING METHOD

The Missile Command also overstated its August 1980 requirements by about \$1 million because it deviated from prescribed Army procedures for forecasting production leadtime. In computing production leadtimes for certain items, the Missile Command used the larger of production leadtimes for the last representative completed buy or signed, undelivered contract. Instead, it should have used the last procurement action--either a completed buy or undelivered contract--which, in many cases, was shorter than what the Command used. (See p. 4.)

#### REQUIREMENTS FOR FIRST ARTICLE TEST ITEMS ARE OVERSTATED

The August 1980 requirements were overstated about \$8 million because the Missile Command included unnecessary leadtime for items with a first article test requirement. GAO found that the leadtime for these type items is doubled. Although the test requirement normally is waived, the leadtime requirements are not reduced. (See pp. 5 and 6.)

#### USE OF STANDARD LEADTIMES OVERSTATES REQUIREMENTS

In addition to using the larger of the two leadtime values previously discussed, the Missile Command used a standard procurement leadtime for about one-third of its items in a buy position during August 1980. In

most of the cases, the standard leadtime was larger than what it would have been if the leadtimes had been based on actual experience. This resulted in overstated requirements of about \$2.3 million. However, in a few cases, the standard leadtime was less than actual; and in those cases, the requirements were understated about \$400,000. The future effects of this practice may be even more dramatic because the Command plans to use standard leadtimes for all active items. (See pp. 8 to 12.)

OTHER IMPROVEMENTS NEEDED

The Missile Command needs to improve its requirements computations in several other areas. The Command's

- criteria for determining what is a representative buy needs to be more definitive (see pp. 14 and 15),
- criteria for computing production leadtime cause the Command to purchase larger leadtime quantities than the other services (see p. 15), and
- computer-generated requirements are based on invalid data nearly 60 percent of the time (see pp. 15 and 16).

RECOMMENDATIONS

GAO recommends that the Secretary of the Army direct the Department of the Army Materiel Development and Readiness Command to:

- Use actual historical delivery time in computing leadtime requirements or revise its standard delivery leadtime to something more representative. (See p. 7.)
- Use the latest production leadtime value in determining production leadtime. (See p. 7.)
- Restrict the use of standard leadtimes to those instances where it can be shown that the historical data is atypical. (See p. 13.)

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--Revise its method for computing requirements for items requiring first article testing. (See p. 7.)

--Develop definitive criteria as to what constitutes representative procurements. (See p. 16.)

Other specific recommendations to the Secretary of the Army are shown on pages 7 and 16.

#### AGENCY COMMENTS

On October 19, 1981, GAO met with Army officials and obtained their oral comments. The Army agreed with each of the report recommendations except the need for more specific criteria for determining what constitutes representative procurements. The Army believed that a Defense standard definition as to when leadtime begins and ends was required and that this would resolve the matter.

While GAO agrees that a standard definition is needed, the problem of representative procurements will only be resolved if the Defense definition also contains criteria on these procurements.

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## CHAPTER 1

### INTRODUCTION

The basic challenge of inventory management is having the proper amount of stock on hand when required--neither too much nor too little. If inventory levels are too low, the Army cannot satisfy customer demands and must undertake costly and often wasteful efforts to recover from out-of-stock positions. If levels are too high, money is invested on inventories which may never be used. In addition, a whole train of unnecessary expenditures is set in motion for more warehouses, transportation, and personnel; storage and distribution facilities are overcrowded; maintenance workload is increased; and inventory excesses are generated which must eventually be purged from the system, usually at a severe financial loss.

The Army's inventory requirements are enormous in both size and strategic importance, and accurately identifying these requirements is an awesome but essential task.

The U.S. Army Missile Command, where we performed our review, is the Army's central buyer and supplier of missile equipment and components, and as such, is responsible for determining worldwide requirements, initiating procurements, controlling inventories, directing distribution and transportation of its material, managing war mobilization reserves, and identifying and disposing of excess material.

The Command manages approximately 56,300 secondary items--reparables and expendables--and has an inventory of about \$436.1 million. During fiscal year 1981, the Command planned to buy about \$273.7 million of replacement items.

The Missile Command uses the Commodity Command Standard System to determine the item quantities to be purchased, rebuilt, and kept on hand. The system forecasts demand and provides recommendations for procurement, repair, reduction, or disposal actions. Item managers analyze these recommendations and supporting studies and either accept or modify the recommendations.

The system uses an item's average recurring demand over the last 24 months as the primary basis for computing requirements. It projects historical demand considering factors which would alter the demand, such as changes in the number of end items deployed, nonrecurring demands, and program changes.

### OBJECTIVE, SCOPE, AND METHODOLOGY

Our objective was to evaluate selected aspects of the requirements determination process at the U.S. Army Missile Command, Redstone Arsenal, Alabama. We directed our review primarily at

determining the validity and reasonableness of Missile Command procedures and practices for estimating procurement leadtime requirements to include administrative, production, delivery, and first article test leadtimes.

To accomplish the review objective, we randomly selected a statistical sample of 100 items from the universe of 1,948 items in a buy position 1/ for August 1980. The results of our review of these items were projected to the universe (see app. I). Additionally, we interviewed command officials and item managers; reviewed pertinent Army regulations, policies, procedures, and internal studies; and analyzed requirements computations and supporting documentation.

Although we performed the review at only one Army inventory management activity, the nature of our findings, coupled with the Army's use of a standardized requirements determination system, could indicate systemic requirements problems at the other Army inventory management activities.

Some of the information contained in this report is also contained in our report to the Secretary of Defense, which contrasts and compares the services' requirements determination processes.

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1/Where computer-generated data recommended that the item be bought. Subsequently, 53 of the 100 items were sent to procurement for buy action.

## CHAPTER 2

### PROCUREMENT LEADTIME DETERMINATION

#### NEEDS SIGNIFICANT IMPROVEMENT

The Missile Command's procurement leadtime <sup>1/</sup> determination process (1) overstates the leadtime required for delivering material from the manufacturer, (2) does not always use the latest available leadtime estimates, and (3) includes unnecessary leadtime for special tests. As a result, requirements for items in a buy position during August 1980 were overstated about \$10.3 million.

#### DELIVERY LEADTIMES ARE OVERSTATED

The Missile Command overstated the August 1980 secondary items requirements about \$1.3 million because it included excessive amounts of delivery leadtimes from the contractor plant to the storage location in the requirements determination process. The Command adds 30 days' leadtime to each item for delivery from the manufacturer to the Army; however, our review showed that this leadtime should be less than 15 days.

Missile Command officials told us that the Command's higher headquarters directed that 30 days' delivery leadtime be added to every item. According to the officials, the figure has been used in the requirements determination system since about 1958, and they did not know of any attempt to evaluate its validity.

Our analysis of the shipment and receipt dates for 53 sample items which had a total of 228 receipts during the last 2 years showed that the average delivery time was 10.5 days and that about 90 percent of the shipments were received in 15 days or less, as shown below.

<u>No. of receipts</u>	<u>Delivery time from contractor's plant to storage location</u>				
	<u>1-10 days</u>	<u>11-15 days</u>	<u>16-20 days</u>	<u>21-30 days</u>	<u>over 30 days</u>
228	155	52	13	3	5
Percent of total	68.0	90.1	96.5	97.8	100.0

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<sup>1/</sup>Consists of administrative and production leadtimes. Administrative leadtime is the time interval from initiation of a procurement action to contract award, and production leadtime is the interval from contract award to delivery of the items.

Recomputation of the requirements, using a conservative estimate of 15 days' delivery leadtime for 53 of the 100 sample items, showed that the requirements were overstated about \$80,000. Therefore, we estimate that the recommended procurements for August 1980 were overstated by \$1.3 million.

MISSILE COMMAND SHOULD  
USE LATEST AVAILABLE DATA  
TO DETERMINE LEADTIMES

The Missile Command also overstated its August 1980 requirements about \$1 million because it deviated from Army regulations which state that production leadtimes will be determined by using the production leadtime shown in the last representative buy or the estimated leadtime shown in the last signed but undelivered contract. However, the requirements system is programmed to use the larger of the two production leadtime values. Thus, if the leadtime value in the undelivered contract is less, the leadtime for the last representative buy is used; and conversely, if the leadtime value of the last representative buy is less, the leadtime value in the last signed, undelivered contract is used. For example, on one sample item, the Command computed the leadtime as 14 months on the basis of the leadtime value for the last representative buy, even though a later leadtime estimate in a signed, undelivered contract showed it to be 9 months.

Our review of sample items with a leadtime history showed that requirements could have been reduced about \$60,000, as shown below, if the Missile Command had followed prescribed regulations for computing leadtimes.

Value of requirements using the larger leadtime of the last representative buy or latest signed, undelivered contract.

\$176,334

Value of requirements using the last leadtime data--either last representative buy or signed, undelivered contract.

114,306

Difference

\$ 62,028

On the basis of the above, we estimate that the recommended procurements for August 1980 were overstated by \$1 million because of deviations from prescribed forecasting procedures. To determine whether the production leadtime values shown in signed but undelivered contracts were, in fact, typical, we compared the estimated delivery dates with actual deliveries on 110 shipments. Our review showed that the contractor delivered material on or before the estimated delivery dates in 73 percent of the cases, and in many other cases, shipments were only a few days late.

LEADTIME REQUIREMENTS  
FOR FIRST ARTICLE TEST  
ITEMS ARE OVERSTATED

The Missile Command significantly overstated leadtime for items with a first article test requirement. The Missile Command may require first article test and approval to ensure that a contractor can provide a quality product. In such cases, the Missile Command tests and approves the initially produced item(s) before the contractor is authorized to acquire production material and produce the remaining items.

The Missile Command estimates production leadtime for items which may require first article testing by doubling the normal production leadtime and adding about 2 months' test time. Officials told us that this procedure provides the contractor the normal production leadtime to produce the initial item(s), about 2 months to test the initial item(s), and another normal production leadtime to produce the remaining quantities. The August 1980 requirements were overstated \$8 million because the Missile Command included unnecessary leadtime for first article tests and approvals.

Our review of 16 sample items with a first article test requirement showed that in each instance the test requirement was waived after contract award, but the requirements were not reduced to reflect the reduced leadtime. The following table shows the effect of including additional leadtime for first article testing.

<u>Sample item</u>	<u>Leadtime without first article test requirement</u>	<u>Leadtime with first article test requirement</u>	<u>Difference in months (note a)</u>	<u>Value of difference (note b)</u>
4935-01-047-6011	15	28	13	\$ 38,610
1260-01-073-5551	12	22	10	6,258
4935-00-591-0617	12	22	10	1,566
1430-01-064-3226	13	24	11	8,000
4935-00-136-4895	13	24	11	75,475
5895-01-037-0157	14	26	12	3,240
1430-00-998-1715	16	30	14	267
5962-01-087-6730	11	20	9	(c)
1260-01-073-1657	11	20	9	142
4140-00-769-7211	14	30	16	70,026
1430-00-875-0740	16	30	14	251,068
4935-00-019-3028	12	22	10	12,250
1430-01-033-1087	11	20	9	700
1430-00-488-1091	15	28	13	9,212
1430-00-459-3239	17	32	15	15,188
3020-00-455-9362	14	26	12	1,570
				<u>\$493,572</u>

a/Includes 2 months for testing. The balance represents the production leadtime allowed to produce the first article.

b/Unit price times average monthly demand times production leadtime months for first article production and testing.

c/Unit price and average monthly demand were not shown in the source data for the sample item.

On the basis of our analysis, we estimate that 262 of the 1,948 items with recommended procurements in August 1980 had a first article test requirement and that the leadtime requirements for these items may be overstated by as much as \$8 million.

Missile Command officials told us that the leadtime requirements are not reduced because the contracts are awarded before they know whether the first article test requirement can be waived. They also said that first article test and approval time should continue to be included in the production leadtime for these items because future procurement awards may be made to new, unproven suppliers, and the first article test may be required. Our review showed, however, that first article tests were conducted on about 17 items a month. This represents only about 6 percent of the estimated 262 items which included first article leadtime in August 1980.

In our opinion, a 6-percent probability of requiring first article leadtime does not justify including first article leadtime on all of these items. The Missile Command should revise its method for determining first article test leadtime to one that requires less inventory investment but yet also minimizes out-of-stock positions. A better method would be one similar to that of the Air Force. The Air Force does not include additional leadtime for items which may require first article testing, and if the contract is awarded to a new producer, the Air Force closely monitors the item's stock position to determine whether interim support is required before the new producer can deliver. If so, a sole- or selective-source contract is awarded to a prior producer to provide the interim support.

#### CONCLUSIONS

The Missile Command adds 30 days' production leadtime to each item to compensate for delivery from the contractor's plant to the storage location when, in fact, the average delivery time is about 10.5 days. As a result, leadtime requirements were overstated about \$1.3 million.

The Missile Command also overstated its requirements another \$1 million because it did not follow prescribed Army procedures for computing production leadtime. Instead of using the latest leadtime data available, the Command used the larger leadtime value of either the last representative buy or the leadtime estimate shown in the last signed but undelivered contract.

Additionally, the Missile Command further overstated its leadtime requirements about \$8 million for first article test items. The Command doubled the leadtime requirements for these items under the assumption that a new contractor would receive the contract and that a first article test would be needed before the contractor proceeded with production. In fact, however, first article tests generally are waived, but the requirements are not reduced to reflect the reduced leadtime. Better alternatives are

available for determining leadtime requirements for these type items; for example, the Command could revise its current procedure to be similar to the one used by the Air Force.

#### RECOMMENDATIONS

We recommend that the Secretary of the Army direct the Department of the Army Materiel Development and Readiness Command to:

- Use actual historical delivery time in computing leadtime requirements or revise the 30-day standard to something more representative.
- Use the latest available production leadtime be it the last representative buy or the leadtime value in the signed but undelivered contract as the basis for forecasting leadtime.
- Revise its method for computing leadtime associated with items having a first article test requirement to avoid a doubling of the requirements when in all probability the first article testing will be waived. The need for a uniform method among the services is addressed in our overview report to the Secretary of Defense.

#### AGENCY COMMENTS

The Army agreed with each of these recommendations and told us that:

- The Army Inventory Research Office has been tasked to study delivery leadtime to determine a more representative leadtime value.
- No Department of Defense standard exists for determining the end of production leadtime, and the Army is studying the area since the latest available leadtime is in itself an arbitrary choice.
- It is not Army policy to double production leadtime when first article testing is required, and action will be taken to correct this deficiency.

### CHAPTER 3

#### LEADTIMES ARE OFTEN BASED ON A STANDARD

#### RATHER THAN ON ACTUAL EXPERIENCE

The Missile Command used standard 1/ administrative and production leadtimes to compute requirements for about one-third of the items in a buy position during August 1980 rather than permitting the leadtimes to change based on actual experience. In the case of administrative leadtime, the 3-month standard was based on average administrative leadtime for all items. For production leadtime, the standard was based on engineering estimates or some previously established leadtime. As a result, the computed requirements were overstated about \$2.3 million for some items and were understated about \$400,000 for other items. The effects of this practice may become even more significant because the Missile Command plans to use standard leadtimes for all active items.

According to current Army regulations, administrative leadtime will be determined by using the last representative procurement action on an item-by-item basis. The regulations also state that production leadtime will be computed using the last representative procurement action--production leadtime value in a signed contract, or representative production leadtimes for similar items if procurement actions were not available during the last 18 months. 2/

#### ADMINISTRATIVE LEADTIME

The Missile Command used a standard administrative leadtime value for 35 of the 100 sample items we reviewed. These leadtimes differed from the actual leadtime values based on the last representative procurement for 29 of the items. The differences caused (1) overstated requirements of \$79,128 on 14 items and (2) understated requirements of \$17,553 on 7 items, as shown in the following table. Although leadtimes differed on 8 other items, the computed requirements were not affected because of the items' low demand.

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1/The use of standard leadtimes was in addition to the situation described on page 4 where the Missile Command used the larger of the leadtime value shown for the last representative buy or the estimated leadtime shown in the last signed, undelivered contract.

2/Missile Command officials said the system was changed to use representative production leadtimes within the last 36 months, but the Army regulation has not been updated.

No. of sample items with standard leadtimes	35
No. of sample items where standard leadtime was more than leadtime based on historical data	14
No. of sample items where standard leadtime was less than leadtime based on historical data	7
No. of sample items where historical data was not available to make a comparison	5
No. of sample items where standard leadtime and historical leadtime were the same	9
Dollar value of inflated require- ments by using standard leadtimes	\$79,128
Dollar value of understated re- quirements by using standard leadtimes	\$17,553

When the above is projected to the universe of items, we estimate that administrative leadtime requirements were overstated \$1.3 million and understated \$287,000 for items in a buy position in August 1980.

Missile Command officials stated that the leadtime standard of 3 months was the average administrative leadtime for all items and using a leadtime average provided more accurate forecasting than using an item's last representative procurement action. For the 35 sample items, we compared the administrative leadtimes based on the last procurement action at August 1980 and February 1981--the time we selected our sample--with the leadtime standard used in the requirements computation. Our analysis showed that in about 70 percent of the cases, the use of actual administrative leadtime would have given a more accurate forecast than the use of a standard, as shown below.

	<u>No.</u>	<u>Percent of total</u>
Sample items where the last actual leadtime at 8/80 was closer to latest leadtime action as of 2/81 than standard leadtime	20	68.9
Sample items where standard leadtime was closer to latest leadtime as of 2/81 than the last actual leadtime at 8/80	9	31.1
Sample items where historical information was not sufficient to make a comparison	<u>a/6</u>	-
Total	<u>35</u>	<u>100.0</u>

a/Not considered in computing the percent of total.

Command officials told us that the Army plans to revise its regulations to base the administrative leadtime forecast on a 2-year average of an item's procurement actions. We believe that this would be better than using the present prescribed method of standard leadtimes or last representative buy. However, unless the Command changes its policy of using leadtime standards, the proposed changes have no effect on the requirements determination process.

PRODUCTION LEADTIME

The Missile Command used a standard production leadtime for 32 of the 100 sample items, and for 24 of the items, the leadtimes differed from the last representative procurement. These differences caused (1) overstated requirements of \$60,892 for 17 items and (2) understated requirements of \$6,416 for 3 items, as shown in the following table. Production leadtimes differed for 4 other items, but requirements computations were not affected because of the items' low demand:

No. of sample items with standard leadtimes	32
No. of sample items where standard leadtime was more than leadtime based on historical data	17
No. of sample items where standard leadtime was less than leadtime based on historical data	3
No. of sample items where historical data was not available to make a comparison	10
No. of sample items where standard leadtime and historical leadtime were the same	2
Dollar value of inflated requirements by using standard leadtimes	\$60,892
Dollar value of understated requirements by using standard leadtimes	\$ 6,416

We estimate that the use of standard production leadtimes instead of actual leadtimes for the items in a buy position in August 1980 caused overstated requirements of about \$1 million and understated requirements of about \$105,000.

Missile Command officials told us that the use of standard leadtimes results in more accurate forecasting. Our analysis showed, however, that the standard leadtimes resulted in less accurate leadtime forecasts than those based on the last procurement action. Comparison of actual production leadtime for the sample items as of February 1981 with the leadtime standards used in the August 1980 forecasts and the last actual production leadtime at that date showed that the last actual production leadtime as of August 1980 more nearly approximated the leadtime forecast in 73 percent of the cases, as shown below.

	<u>No.</u>	<u>Percent of total</u>
Sample items where the last actual leadtime at 8/80 was closer to latest leadtime action as of 2/81 than standard leadtime	16	72.7
Sample items where standard leadtime was closer to latest leadtime as of 2/81 than the last actual leadtime at 8/80	6	27.3
Sample items where historical information was not sufficient to make a comparison	<u>a/10</u>	<u>-</u>
Total	<u>32</u>	<u>100.0</u>

a/Not included in computing percent of total.

MISSILE COMMAND INTENDS  
TO USE STANDARD LEADTIMES  
FOR ALL ITEMS

Missile Command officials told us the Command's policy is to use standard procurement leadtimes for all active items. We believe this policy is contrary to Army regulations, Army Materiel Development and Readiness Command instructions, and the intent of the requirements computation system. Army Regulation 710-1 makes no provision for using standard leadtimes. Rather, it states that with certain exceptions, administrative and production leadtimes will be based on the leadtime value of the last procurement action. Additionally, the Readiness Command, in 1978, directed its commodity commands to examine all items and justify the use of standard leadtimes. Although the Missile Command informed the Readiness Command that standard administrative and production leadtimes were used only when justified on an item-by-item basis, Missile Command officials told us that they did not justify the use of standard leadtimes for each item. Instead, the officials used the Command's policy to use standard leadtimes for all items as the overall justification.

CONCLUSIONS

The Missile Command used standard procurement leadtimes for about one-third of the items in a buy position in August 1980 and plans to use standard leadtimes for all active items. This practice caused overstated requirements of about \$2.3 million and understated requirements of about \$400,000. We recognize that in certain instances, procurement leadtimes may need to be based on something other than the historical leadtimes; however, the use of

standard leadtimes should not be routine. In those cases where a standard is used, it should be justified and the standard leadtimes should not remain indefinitely in the requirements computation.

#### RECOMMENDATIONS

We recommend that the Secretary of the Army direct the Department of the Army Materiel Development and Readiness Command to rescind its policy of using standard leadtimes for all items and restrict the Command's temporary use to those instances where it can be shown that the historical data is atypical.

#### AGENCY COMMENTS

The Army agreed with the recommendations and told us that each inventory control activity will be permitted enough flexibility to determine the most representative administrative leadtime. However, emphasis will be placed on the use of actual leadtime rather than on a standard leadtime value.

## CHAPTER 4

### OTHER REQUIREMENTS AREAS

#### WHICH NEED IMPROVEMENT

The Missile Command also needs to improve its requirements computations in several other areas to include (1) defining what is a representative buy, (2) determining whether its current criteria for terminating production leadtimes best serve the the Command's purpose, and (3) improving the accuracy of the data base used in the requirements determination process.

#### MISSILE COMMAND HAS NO DEFINITIVE CRITERIA FOR DETERMINING REPRESENTATIVE LEADTIMES

Army regulations direct that only representative procurement actions be used in computing future procurement leadtimes. However, the Missile Command's instruction requires that all procurements be designated as representative if they are made to replenish depot stock. Thus, the lack of definitive criteria for determining which purchases are representative could result in overstated or understated requirements.

Army regulations require that an item's leadtime be based on the last representative procurement. The regulation is silent as to what is representative except that it would exclude expedited procurements and procurements that encountered extended delays due to contract litigation, strikes, natural disasters, urgent bids, direct delivery orders, administrative delays for technical data packages, reproduction work, and funding problems. However, other factors, such as method of procurement and quantity ordered, could affect the representativeness of individual procurements.

Our review showed that the Missile Command designated 88 percent of the administrative leadtimes and 100 percent of the production leadtimes for the 100 sample items as representative. However, several of these actions had been expedited, and in many cases, actions were coded representative even though there were large leadtime variations between the buys of the same item. To illustrate, the production leadtimes for one item ranged from 123 days to 435 days, and the production leadtimes for another item ranged from 168 days to 478 days. Nevertheless, all the buys were coded representative.

We could not determine the exact reasons for the wide variations; however, they could have been due to such factors as the quantity bought or method of procurement. In our opinion, the fact that the procurement action was for replenishment stock to be shipped to a depot does not necessarily mean that it is representative.

We believe that a more definitive definition--which recognizes significant differences in leadtimes, quantities, and procurement method--is needed to ensure that procurement actions are, in fact, representative.

ARMY CRITERIA FOR DETERMINING  
PRODUCTION LEADTIME EXCEED  
AIR FORCE AND NAVY CRITERIA

The Army's method for determining production leadtime results in larger leadtime requirements than the methods used by the other services. The Army terminates production leadtime upon receipt of the first significant contract delivery--a receipt quantity equal to or greater than one-third of the total procurement quantity. In contrast, the Air Force terminates the leadtime when at least 10 percent of the total quantity ordered is received, and the Navy terminates production leadtime upon the average initial receipt of the item by all consignees.

Since orders are often delivered incrementally, these procedural differences could significantly affect the leadtime requirements. To illustrate, when the ordered quantity of 100 is received incrementally, the Navy would terminate the leadtime with the first receipt; the Air Force when 10 items were received; and the Army when 34 items were received. Thus, the production leadtime values used in computing future procurement leadtimes would be different, and the Army would buy more assets to cover the same delivery schedule.

MISSILE COMMAND'S DATA  
BASE IS OFTEN INACCURATE

The Missile Command's computer-generated requirements studies contained invalid or inaccurate data about 60 percent of the time and required extensive manual adjustments to correct the errors.

The Missile Command's data base for its automated requirements determination system includes stockage data, demand history, returns, and disposals and planned use of the items. The system analyzes this data and generates a requirements study recommending procurement, repair, cutback, or disposal actions. As a part of the requirements computation process, item managers analyze the computer-generated studies and supporting information and make recommendations to proceed with or change the study recommendations.

Our review showed that the item managers manually adjusted the computer-generated requirements studies for 63 of the 100 sample items. In 47 of these cases, the item manager canceled recommended procurements because of invalid (1) rebuild requirements, (2) average monthly demands, (3) backorders, and (4) due-ins. Although some changes are necessary to update the data base, we believe that better file maintenance would significantly

reduce the number of these changes and would decrease the risk that errors may remain undetected.

#### CONCLUSIONS

Representative leadtimes for prior procurement actions are to be used in forecasting procurement leadtimes; however, the Missile Command does not have definitive criteria for determining what is a representative procurement action.

Additionally, the Army's method for determining when production leadtime is terminated causes it to purchase larger leadtime quantities than the other services. We also found that the Missile Command's computer-generated requirements studies made invalid recommendations nearly 60 percent of the time because of inaccuracies in the data base.

#### RECOMMENDATIONS

We recommend that the Secretary of the Army direct the Department of the Army Materiel Development and Readiness Command to develop definitive criteria as to what constitutes representative procurements. In addition to the exclusions already provided for, the criteria should recognize and consider variations in leadtimes, methods of procurement, and quantities procured.

Additionally, we recommend that the Secretary of the Army reemphasize to the Department of the Army Materiel Development and Readiness Command the necessity for maintaining an accurate data base to reduce manual adjustments and to make the requirements determination process more reliable.

#### AGENCY COMMENTS

In commenting on our recommendation concerning the need for more specific criteria for determining what constitutes representative procurements, the Army stated that a standard Defense definition of when leadtime begins and ends was required and that that this would resolve the matter. While we agree that a standard definition is required, the problem of representative procurements will only be resolved if the Defense definition also contains criteria on representative procurements.

The Army agreed with our recommendation on the need to maintain an accurate data base to reduce manual adjustments and to make the requirements determination system more reliable.

CATEGORIES OF ESTIMATES AND ASSOCIATED95-PERCENT CONFIDENCE LEVEL INTERVALSAT THE U.S. ARMY MISSILE COMMAND

<u>Category</u>	<u>Estimate</u>	<u>Range</u>	
		<u>Low</u>	<u>High</u>
Overstated requirements as a result of using the larger production leadtime of the last representative buy or latest signed, undelivered contract instead of using the latest leadtime data.	\$1,012,177	\$259,309	\$ 1,983,118
Overstated requirements as a result of using standard administrative leadtimes instead of using leadtimes based on the latest available data.	\$1,295,325	\$ 78,128	\$ 2,984,131
Overstated requirements as a result of using standard production leadtimes instead of using leadtimes based on the latest available data.	\$ 996,802	\$141,051	\$ 1,852,553
Understated requirements as a result of using standard administrative leadtimes instead of using leadtimes based on the latest available data.	\$ 287,343	\$ 17,553	\$ 591,351
Understated requirements as a result of using standard production leadtimes instead of using leadtimes based on the latest available data.	\$ 105,030	\$ 6,416	\$ 246,256
Overstated requirements as a result of using a 30-day delivery leadtime instead of the actual leadtime of 15 days.	\$1,309,662	\$402,820	\$ 2,216,504
Number of items in a buy position in August 1980 that had a first article test requirement.	262	144	380
Overstated requirements for first article test items.	\$8,079,774	\$493,572	\$16,808,762

**DAT  
FILM**