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ARMY INVENTORY MANAGEMENT: INVENTORY AND PHYSICAL
SECURITY PROBLEMS CONTINUE(U) GENERAL ACCOUNTING OFFICE
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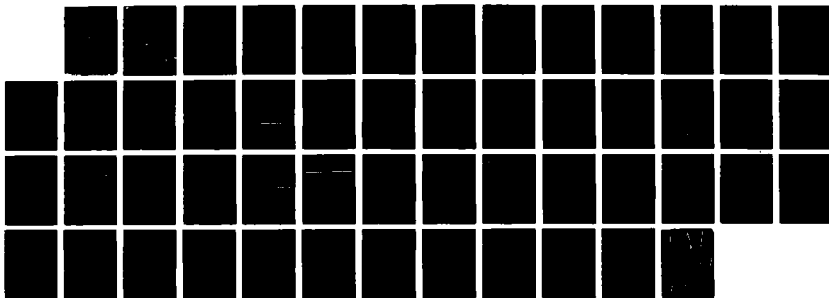
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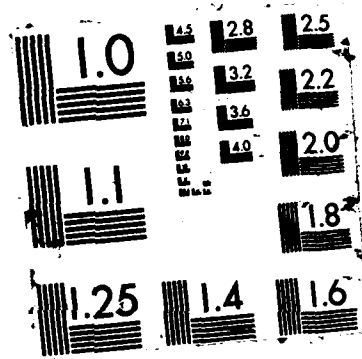
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Report to Congressional Requesters

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October 1987

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ARMY INVENTORY MANAGEMENT

Inventory and Physical Security Problems Continue



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

National Security and
International Affairs Division

B-222859

October 9, 1987

The Honorable John Glenn
Chairman, Committee on Governmental Affairs
United States Senate

The Honorable Pete Wilson
United States Senate

As requested in Senator Wilson's letter of April 15, 1986, we reviewed the Department of the Army's inventory management. This is one in a series of reports related to the effectiveness of defense logistics.

As arranged with your Offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from its issue date. At that time, we will send copies to interested committees and other members of Congress; the Secretaries of Defense and the Army; and the Director, Office of Management and Budget. Copies will also be made available to other parties upon request.

Frank C. Conahan

Frank C. Conahan
Assistant Comptroller General



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Executive Summary

Purpose

The Department of the Army maintains wholesale and retail inventories valued in the billions of dollars to meet the needs of its forces throughout the world. To ensure economic and effective supply support, it is essential that Army wholesale and retail inventory managers maintain sufficient but not excessive inventories. Accurate inventory records and adequate physical security over the inventories are integral elements in providing this assurance.

GAO evaluated the accuracy and completeness of the various indicators used by management to assess the effectiveness of its inventory management. GAO also assessed the adequacy of the physical security over the inventories at several locations.

Background

The Army wholesale system is comprised of six inventory control points which determine inventory requirements and procure the items, and three major wholesale distribution depots which receive, store, and issue stock to retail activities. In fiscal year 1986, the wholesale system had inventories of over \$22 billion.

The Army retail system is decentralized, and is comprised of numerous supply support activities at Army bases and installations located throughout the world. The amount of inventory managed at the retail level is not readily available, but it has been estimated in the tens of billions of dollars.

Because the Army's effectiveness indicators do not provide a representative view of how well the inventory is being managed, GAO took a statistical sample of items managed by the Tank-Automotive Command (one of the larger inventory control points that manages about \$4 billion of inventory) and stored at the New Cumberland Army Depot (one of the three major wholesale distribution depots). The sample results were projected to the universe of items stored at that depot and were compared to what was being reported to the Army and the Department of Defense (DOD).

Results in Brief

The inventory effectiveness indicators, while generally complying with DOD policy, are misleading and do not reflect the degree of inventory inaccuracies that exist at the wholesale and retail levels. As a result, Army and DOD management may not have complete and accurate information for making many important inventory decisions.

Physical security over sensitive munitions also is a problem. The lack of proper storage facilities, insufficient serial number control over the munitions, and guard personnel problems all add up to increased vulnerability of these type of weapons.

Many of the same inventory management problems have been previously reported by GAO and others over the past several years, and promised corrective actions have either not been taken or have not proven effective.

Principal Findings

Inventory Adjustment Indicator

Improper handling of inventory adjustments has masked the degree of inventory inaccuracies that exist at the wholesale and retail inventory levels. In fiscal year 1986, the Tank-Automotive Command reported inventory adjustments of \$24 million when, in fact, its inventory adjustments totaled about \$390 million. The \$366 million difference represents reversals of earlier transactions and are not counted as adjustments for reporting purposes. GAO believes that all adjustments should be reported.

GAO found instances where the Army did not make necessary and required physical inventories before making record adjustments when variances were found between custodial and accountable records.

The problem of underreported adjustments is compounded because the Army's research of the variances between its physical inventories and its records have focused primarily on reconciling the variances rather than identifying why the variances occurred.

Record Accuracy Indicator

GAO inventoried a statistical sample of 330 items and found that the inventory records for about 56 percent of the items were inaccurate. These inaccuracies, when projected to the universe, represent about 13,400 of the 23,800 Tank-Automotive Command items stored at the depot. For fiscal year 1986, the Tank-Automotive Command reported a record accuracy rate of 91 percent. This percentage was arrived at by excluding all inventory variances of \$800 or less which is in accordance with DOD policy. GAO considered a record to be inaccurate regardless of the dollar amount of the variance.

GAO's sample results also showed significant dollar and unit variances between the value of items inventoried and the value recorded. In addition to record accuracy, GAO believes that unit and dollar variance could provide management with an added perspective on inventory management effectiveness.

Physical Security

Adding to the problem of inventory inaccuracy is the need for better physical security over items—particularly at overseas locations. The physical security deficiencies GAO found included storing sensitive munitions in improper facilities which were not properly protected by intrusion detection sensors, and failure to follow prescribed procedures for maintaining serial number control over the munitions.

Collectively, the problems of inaccurate inventories, not knowing the cause of the inaccuracies, and poor physical security make Army inventories highly vulnerable to theft, diversions, or other abuses. None of these areas were reported as part of the Army's annual assessment of inventory management of internal controls.

Recommendations

GAO recommends that the Secretary of the Army direct the inventory managers to:

- Perform a physical inventory of all variances disclosed by comparing the accountable and custodial records, and use the results of the inventory as the basis for making inventory adjustments.
- Report all inventory variances between the physical inventories and accountable records and use the variances in determining inventory management effectiveness.
- Develop an inventory methodology to obtain a more representative and realistic view of its inventory management effectiveness.
- Reemphasize the need for effective research that identifies the reasons for the variances and track these reasons over a period of time to identify any systemic problem areas.

GAO is also making other recommendations which are discussed in chapter 6.

Agency Comments and GAO's Evaluation

DOD generally agreed with all of GAO's recommendations and identified specific actions they plan to implement.

GAO considers DOD's proposed actions to be a step in the right direction and plans to monitor DOD's implementation actions.

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Abbreviations

ALMSA	Automated Logistics Management Systems Activity
AMC	Army Materiel Command
DOD	Department of Defense
GAO	General Accounting Office
ICP	inventory control point
OSD	Office of the Secretary of Defense
SAILS	Standard Army Intermediate Level Supply
TACOM	U.S. Army Tank-Automotive Command

Introduction

Army inventories are managed at two supply levels: (1) the wholesale supply level, comprised primarily of six inventory control points (ICPs) and three major wholesale distribution depots and (2) the retail supply level, made up of units, posts, camps, and stations. The Army wholesale system is centrally managed by the Army Materiel Command (AMC). The ICPs compute item requirements and procure the items and the depots receive, store, and issue stock to retail activities. During fiscal year 1986, the Army managed wholesale inventories valued at about \$22 billion.

The Army retail system is decentralized. It consists of hundreds of supply support activities at Army bases and installations located in the United States and overseas. These activities range from small forward support units to large installation and division support organizations. The value of inventory at these locations is not readily available; however, the Army estimates the value in the tens of billions of dollars.

Importance of Accurate Inventory Records

Inventory records are the basis for many management decisions that directly affect what items to buy, when to buy, and how many to buy. Accurate inventory records are essential if management is to meet the needs of the operating units it supports. Inaccurate inventory records can result in unnecessary procurements, critical supply shortages, or accumulations of excess stock. All of these can have an adverse effect on the readiness and capability of U.S. forces.

The Army maintains two types of inventory records for each item. The ICPs maintain the official inventory record called the accountable record and the depots maintain the custodial record. Periodically, these two records are reconciled to determine if they accurately and consistently reflect the availability of items in the wholesale system.

At the wholesale level, the Army uses two key indicators to measure the effectiveness of its inventory management—record accuracy rate and the gross adjustment rate. Both of these indicators are calculated after the inventory records are compared to the physical count for the same items. The record accuracy rate is computed based on the number of inventory records not requiring major adjustments divided by the number of inventory records represented by the items inventoried. The gross adjustment rate, used by the Army as an indicator of inventory management effectiveness, is the value of all adjustments—gains and losses—compared to the average dollar value of the inventory. The

Army has established a goal of 90 percent for record accuracy and 6 percent per year for the gross adjustment rate.

At the retail level, record accuracy is computed based on the number of inventoried items not requiring adjustment of \$25 or more compared to the total number of items inventoried. The Army's record accuracy goal at the retail level is 90 percent.

Prior Audits

Problems with Army supply management and record inaccuracies are well documented. Numerous reviews by us, the Army Audit Agency, and other audit groups have highlighted problems in the inventory management area for a number of years.

In a 1981 report,¹ we examined Army policy, procedures, and automated logistics programs relative to the management of inventories at the retail level. We reported that retail activities overstated stock requirements and inflated budget requests for procurement funds and spending authority by millions of dollars annually because of inaccurate order ship time, inventory records, and demand data used in requirements computations. These problems existed because prescribed policies and procedures were either inadequate or were not being properly implemented.

In a November 1983 report,² we noted that the inaccuracy of the Army, Air Force, and Defense Logistics Agency inventory records was much greater than reported to the Department of Defense (DOD). This was because a large percentage of inventory adjustments was improperly excluded from statistics reported to DOD. Also, in many cases, physical inventory adjustments were not made because of arbitrary and erroneous reconciliations of physical inventory variances.

We attributed many of the problems to inadequate management emphasis and priority on maintaining accurate inventories, the need for more effective quality control review, noncompliance with DOD's policy, shortage of qualified personnel, and lack of individual accountability for

¹Opportunities Still Exist For the Army to Save Millions Annually Through Improved Retail Inventory Management (LCD-81-16, Jan. 19, 1981).

²Navy's Progress in Improving Physical Inventory Controls and the Magnitude, Causes, and Impact of Inventory Record Inaccuracies in the Army, Air Force, and Defense Logistics Agency (NSIAD-84-9, Nov. 4, 1983).

actions affecting inventory record accuracy. The Army and DOD generally concurred with our findings and proposed certain actions to correct these problems.

As discussed throughout this report, corrective actions were either not taken or if taken, the results have not proven effective. The lack of effective corrective actions can be attributed, in part, to the fact that many of the inventory management weaknesses are masked by the reported statistics which show the Army is doing a good job in managing its inventory. However, as demonstrated by this report, the reported statistics, while generally complying with DOD policy, are extremely misleading for gauging the effectiveness of inventory management. The current status of the Army's actions and our evaluation of these actions is shown in appendix I.

In November 1984, as part of a DOD-wide audit of physical inventory adjustments, the Army Audit Agency reported problems with the Army's inventory controls and inventory record accuracy, including

- inventory adjustments not being accurately recorded and reported,
- accountable records not being properly adjusted,
- causative research³ to determine the underlying reasons for inventory variances not being adequately performed, and
- quality control program reviews not being of sufficient depth and scope to identify specific causes for inventory inaccuracies.

In May 1986, we again reported⁴ on the results of inventory management practices in the services and Defense Logistics Agency. Our report identified significant supply-management problems in the areas of receipt confirmation, records accuracy, inventory taking, reconciliation and research of inventory discrepancies, retail activity controls over inventory, and physical security.

Although the services and Defense Logistics Agency had taken some corrective actions in response to the prior reports, they continued to experience significant inaccuracies in inventory records and physical inventory adjustments, and in many cases, causative research was ineffective.

³Causative research is an in-depth investigation of inventory adjustments to determine why they occurred.

⁴Inventory Management: Problems in Accountability and Security of DOD Supply Inventories (NSIAD-86-106BR, May 23, 1986).

Objectives, Scope, and Methodology

→ The objectives of this review were to assess in greater detail the problems identified in our May 1986 report, and the Army's actions to address these problems. More specifically, our objectives were to determine and evaluate the (1) effectiveness of Army inventory control procedures, including inventory management and reporting practices, (2) reported accuracy of inventory records, (3) effectiveness of physical security being provided to control and safeguard inventories, (4) corrective actions needed to improve inventory management effectiveness, and (5) adequacy of internal controls in the inventory management area.

← This → Our review, at the wholesale level, was performed at the Army's Tank-Automotive Command (TACOM), one of six Army ICPS, and the New Cumberland Army Depot, one of three major wholesale distribution depots. As of May 1987, TACOM-managed items were valued at about \$4 billion. Of this total, we estimate about 23,800 items valued at about \$453 million were stored at New Cumberland. Our review at the retail level was performed at selected inventory activities at the 4th Infantry Division and the Installation Supply Activity at Fort Carson, Colorado; the 25th Infantry Division at Schofield Barracks, Hawaii; and the 3d Armored Division in the Federal Republic of Germany. (See app. II for a complete list of the activities we visited.)

To assess inventory record accuracy and other measures of effectiveness, we inventoried a statistical sample of 330 TACOM-managed items stored at the New Cumberland Army Depot. We compared our inventory results to what was shown on the custodial records and the accountable records. We projected the results of our physical inventory at a 95-percent confidence level to the universe of all TACOM-managed items stored at New Cumberland. Using this information, we computed various inventory effectiveness measures and compared these to the effectiveness measures reported by TACOM to higher headquarters and DOD.

Our review was performed in accordance with generally accepted government auditing standards from June 1986 through May 1987.

The Extent of Wholesale Inventory Record Inaccuracy Is Not Being Reported

Inventory effectiveness indicators used by the Army are misleading and do not accurately reflect the extent of inventory record inaccuracies. The principal reasons are (1) inappropriate physical inventory adjustment procedures and practices which result in underreporting inventory adjustments and (2) computer processing problems which result in overstatements of average inventory balances and erroneous inventory adjustments.

The statistics reported by the Army to DOD on the Inventory Control Effectiveness report and to Army headquarters on its Report of Physical Inventory showed that inventory accuracy goals are being achieved. However, the reported inventory adjustments are significantly understated because hundreds of millions of dollars of inventory adjustments are treated as accounting reversals and accounting errors and are not required to be reported as adjustments or used in determining the inventory adjustment rate. Also, the record accuracy rate is significantly overstated because DOD and the Army exclude any inventory variance of \$800 or less from their computations. Furthermore, the causes of the inventory variances are not being effectively researched to identify the systemic problem areas. Additionally, we found inventory accuracy to be a major area of vulnerability even though TACOM had reported it as a low risk area in its annual assessment of internal controls.

Reported Inventory Accuracy Is Misleading

On an Army-wide basis during fiscal year 1986, the Army reported physical inventory adjustments totaling \$413.5 million and a gross adjustment rate of 1.87 percent as compared to the Army's goal of 6 percent or less. Also, its reported record accuracy rate was 89.6 percent as compared to its goal of 90 percent or better. However, these statistics are misleading and do not reflect the extent of inventory inaccuracies as demonstrated by our review at TACOM.

Physical inventory adjustments at TACOM are significantly understated because inventory variances are resolved by reversing previous gain or loss transactions, rather than being reported as inventory adjustments. In fiscal year 1986, TACOM reported physical inventory adjustments totaling \$24 million and a gross adjustment rate of zero. However, its adjustments actually totaled about \$390 million which consisted of

reversals of \$37 million, accounting errors of \$329 million,¹ and adjustments of \$24 million. TACOM adjusted its accountable records to reflect the \$390 million of adjustments, accounting errors, and reversals. However, for reporting purposes, it does not consider reversals and accounting errors as inventory adjustments.

According to the Army inventory management policy for computing the gross adjustment rate, physical inventory adjustments can be offset by reversing erroneous transactions as long as the previous transaction is not more than 1 year old and a physical inventory has not been performed in the interim. We found that TACOM is not adhering to this policy. It is permitting reversals of transactions that occurred months and even years prior to the last inventory.

TACOM's reported gross adjustment rate of zero was based on \$24 million of reported inventory adjustments offset by \$37 million of reversals. This resulted in a negative \$13 million which equals a zero adjustment rate. The gross adjustment rate also excluded \$329 million of accounting errors. If TACOM had considered all of its reversals, accounting errors, and adjustments, it would have reported an adjustment rate of about 6.6 percent.

After discussing these matters with the AMC Chief of the Inventory Control Effectiveness team, the AMC Chief agreed that TACOM was not following DOD's policy on some of its reversals. They plan to issue a policy statement emphasizing that reversals should not be made to transactions that occurred before the last inventory.

Not only does the use of the reversal method result in understating the gross adjustment rate, it also results in overstatement of record accuracy. This is because under current reporting procedures, these types of transactions are not considered as inventory adjustments, and therefore, are not included in the record accuracy computation. Furthermore, the use of the improper reversals masks the inventory management problems by making it appear that inventory adjustments are minimal.

During fiscal year 1986, TACOM reported that inventory adjustments of \$24 million was based on inventories of 24,159 items, and that the inventory records for 13,724 of these items required correction. This

¹ As interpreted by TACOM, the major difference between a reversal and an accounting error is the age of the transaction being reversed. Normally if the transaction is less than 1 year old, the adjustment is classified as a reversal and if over a year it is classified as an accounting error.

represents an initial record accuracy rate of 43.2 percent. Under current reporting procedures, adjustments under \$800 are excluded from the computation of record accuracy. By following this procedure, TACOM reported an accuracy rate of 91 percent.

As discussed below, in certain cases, inventory adjustments were not based on a physical inventory, and in other cases where physical inventories were performed, the variances were not reflected as inventory adjustments.

Examples of Improper Inventory Adjustments

We selected 15 inventory variances valued at \$20,000 or more that were processed by TACOM in October 1986. Eight of these were improperly resolved by reversing transactions that occurred before the last inventory date. For example, an October 1986 physical inventory at New Cumberland revealed a shortage of 11 axle assemblies (stock number 2520-01-085-6982) with a unit price of \$11,066. This shortage was resolved by partially reversing a June 20, 1980, gain of 25 axles rather than making an inventory adjustment. TACOM's accountable records were adjusted to bring them into agreement with the custodial records, and the transaction was classified as an accounting error.

As shown in table 2.1, the eight improper inventory reversals were made against transactions that occurred before the recorded date of the last inventory.

Table 2.1: Reversal Transactions and Dates of Latest Inventory

Item	Date of last inventory	Date of transaction reversed	Effect on inventory gain or (loss)
Axle assembly	10-07-86	06-20-80	\$(121,726)
Track shoe	09-15-86	07-24-81	(100,350)
Brake shoe	10-21-86	12-01-83	(255,675)
Dust boot parts kit	09-26-86	09-16-84	(20,850)
Shaft assembly	08-05-86	06-25-85	27,604
Oil seal retainer	09-16-86	07-02-85	31,330
Engine with container	10-03-86	08-29-85	63,910
Elevator control	09-26-86	03-11-86	24,730
Total			\$646,175

We also reviewed 16 adjustments that resulted from TACOM's attempt to match the accountable records with the custodial records. Eleven of

these adjustments were resolved by making physical inventory adjustments, totaling \$477,862, even though physical inventories had not been taken. In one case, comparison of the two records showed a difference of four cylinder assemblies (stock number 2530-00-999-4772) with a unit price of \$9,792. Rather than verify the loss by taking a physical inventory, TACOM processed a physical inventory adjustment of \$39,168 for the four cylinders to bring the accountable and custodial records into agreement. The correct way to handle the variances would have been to take a physical inventory to validate the variances and then use the results of the inventory for making an inventory adjustment. The remaining five variances were resolved by improperly reversing earlier transactions.

Impact of Computer Processing Problems on Inventory Accuracy and Reporting

Computer processing problems have resulted in improper inventory adjustments and overstatements of the average inventory value used to compute the inventory adjustment rate. In addition, the dates of the latest inventory are not always recorded, and without accurate inventory dates, inappropriate decisions can be made on making reversals and scheduling when another inventory should be taken. The Army recognizes its computer processing problems and has initiated corrective actions.

Attempts to Reconcile Accountable and Custodial Records Have Not Been Successful

The Army has not corrected computer processing problems which affect the reconciliation of the accountable records maintained by the ICP with the custodial records maintained by the depot. As a result, TACOM continues to make improper inventory adjustments and depot stocks have been unavailable for issue for days at a time.

Army inventory procedures require the quarterly comparison of accountable records with custodial records to determine the accuracy of the quantity of stock on hand. The comparisons continue to generate incorrect inventory data which decreases supply performance, and require many hours to correct and reestablish the inventory records. According to Army officials, the problems experienced in trying to compare these records are due primarily to numerous computer system changes which have been implemented over the years without being properly tested.

Excerpts from TACOM's report on the September 1985 quarterly comparison indicate the extent of the problem:

- The attempted reconciliation was considered a "disaster."
- The numerous failed reconciliations over the years have all had the same result: "chaotic" data bases resulting in drastic drops in supply performance.
- At four depots, 43,000 items were not available for issue for up to 11 days while the inventory records were being restored.
- Inventory balances for 16,000 items with inventory variances of less than \$800 were improperly adjusted.

Incorrect Inventory Values Reported

TACOM's reported quarterly gross adjustment rate has been based on inflated inventory values since the third quarter of fiscal year 1986. The gross adjustment rate is based on the average inventory balance for the preceding 12 months; therefore, inaccurate inventory balances will influence the gross adjustment rate until the inaccurate balances are purged from the data base.

Monthly inventory reports for the year ended February 1987 showed that, with the exception of the April and May 1986 reports, the value of items on hand ranged from \$4 billion to \$4.5 billion. For these 2 months, inventory balances of \$8.9 billion and \$13.9 billion were reported. After we brought this matter to the attention of TACOM inventory personnel, they determined that the reported inventory values have been overstated since April 1986 and continue to influence the gross adjustment rate. According to TACOM inventory managers, computer programmers have not been able to identify the cause of these errors.

Inventory Dates Not Recorded

The Army's computerized inventory system does not always record the date of the last inventory. Army regulations require that classified, pilferable, and sensitive items be inventoried at least annually and all other items be inventoried at least once every 3 years. However, if the date of the last inventory is not known, the Army cannot determine what items need to be inventoried or when the inventories should be done. In addition, the date of the last inventory is needed to determine the cutoff dates for making reversals of inventory variances.

TACOM inventory officials recognize the problem, but told us that they have been unable to determine why the inventory dates are not always being recorded in the computer system.

Army's Proposal for Developing a New Inventory System

As a result of longstanding criticism of its computerized inventory processing system, the Army has initiated action for redesign of its system. In July 1985, the AMC tasked its computer programming agency—the Automated Logistics Management Systems Activity (ALMSA)—to develop a physical inventory reconciliation system that would link the ICPS' Commodity Command Standard System, the depots' standard depot system, and AMC's management information system. In developing the new system, ALMSA was directed to consider a system that would simultaneously update both the ICPS' and depots' inventory records.

In March 1986, AMC submitted a concept paper on inventory modernization for review and comment by Army inventory managers. The objective was to simplify the inventory process by having only one inventory accountable record with both the depot and the ICP having access to it. Under this system, the depot would count the material and compare the count to the accountable record using a remote terminal. The accountable record would automatically be reconciled to the physical count, and if there is an inventory variance, the depot would adjust the accountable record and report a cause code that would identify the reason for the variance. As of May 1987, system redesign had not progressed beyond the concept stage due to the lack of funding. AMC plans to contract for a functional description and economic analysis of the new system. We were told that because the new system will require major changes in computer hardware, the system will probably not be operational until about 1992.

Ineffective Quality Control

As part of its inventory management system, TACOM requires periodic quality control reviews of transactions (i.e., inventory adjustments and receipt postings) affecting inventory accuracy. Data developed during these reviews are used to brief management on areas needing corrective action. However, many of the required reviews are not being performed or when they were performed, corrective actions were not being developed or implemented.

Quality control reviews were not being made for many of the major inventory adjustments to determine the validity of the adjustments. During fiscal year 1986, TACOM's computer system rejected 22 percent of the inventory adjustments submitted for processing on the basis that the adjustments were not reasonable, that is, the amount of the adjustment was greater than the inventory balance. In these cases, additional research is performed to determine the problem. However, reviews were not made for the other 78 percent of the adjustments that were accepted

without question. In view of the previously discussed improper inventory adjustments, we believe that inventory adjustment transactions need to be reviewed to ensure that they are accurate and valid.

TACOM's quality control reviews to determine whether item receipts are being posted to the custodial and accountable records within the prescribed time frame (1 day) have consistently shown that the time frame is not being met. Although these problems have been reported to management on numerous occasions, the number of unprocessed receipts remained at high levels throughout the year ending February 1987. As of the end of January 1987, TACOM had a backlog of over 3,800 unidentified material receipts. Some of the material had not been identified for over 7 years. The effect of not taking prompt action to identify and post material receipts is illustrated by the following example:

Twenty-five tube assemblies for the M1 tank engine were not posted to TACOM's accountable records when the items were received by the depot in October 1985 because the federal stock number was not identified. However, the part number and contract number were shown on the shipping documents. On October 4, 1985, the depot requested that TACOM research the item part number and identify the appropriate federal stock number. The items were finally posted to the accountable records on May 7, 1987. During the 19-month delay, the tube assemblies were in short supply and three high priority requisitions were outstanding for the item.

Causative Research Not Identifying Causes

Causative research as it pertains to inventory management tries to identify weaknesses in inventory control systems so that corrective actions can be taken. Army regulations require the ICs and depots to perform causative research when an inventory variance exceeds certain limits. The reasons for the variances are to be categorized by error type and reported to higher command management. Tracking the types of errors over a period of time allows management to identify systemic problems and develop corrective actions.

At TACOM and New Cumberland causative research is not being done as required. Both consider causative research completed when the variance is reconciled and, both seldom assign cause codes or track causes to identify systemic problems. As a result, corrective actions to address the systemic problems are not being developed.

Causative Research at TACOM

During the first quarter of fiscal year 1987, TACOM reported 1,120 major inventory variances (variances of \$800 or more). Of this total, only 25 related to physical inventories with the remainder related to attempted record matches, warehouse denials, and so forth. For the 25 related to inventories, TACOM identified receipt posting and material issue problems as the general cause of the variances in 13 cases. The causes for the other 12 variances could not be identified.

Causative Research at New Cumberland

The New Cumberland Army Depot uses the causative research process to try to reconcile a major inventory variance, but not to determine what caused the variance.

The depot prepares a monthly report of all cases researched and resolved as part of the causative research process. During fiscal year 1986, the depot reported that it resolved the inventory variances for 82 of the 114 TACOM requests for causative research. However, the depot considers resolved to mean that it was able to reconcile the inventory variance not to identify the reason for the variance. In actuality, the depot identified the causes for the inventory variance for only 16 cases examined. The reasons for the remaining unresolved variances were not determined by the depot.

Even in those cases where the reasons were specified, they were often inconclusive and incomplete. The following example illustrates what the depot considers a resolved variance. On January 29, 1986, the depot reported to TACOM that causative research showed that the loss of two support assemblies (valued at \$15,730) was due to an erroneous gain of four assemblies on April 15, 1985. In explaining the April 13, 1985, transaction, the depot explained that the gain was partially due to an erroneous loss of three assemblies on August 18, 1984. What was overlooked was the fact that physical inventories had been performed to validate the existence of the on-hand items on two separate occasions.

Assessment of Internal Controls

Internal controls are an essential element of effective inventory management. When properly implemented, internal controls provide reasonable assurance that

- property, funds, and assets are safeguarded;
- obligations and costs comply with applicable laws; and
- operational revenues and expenditures are properly recorded and accounted for.

Agency heads are required to evaluate their internal controls and the vulnerability of the programs they manage to determine their susceptibility to loss or unauthorized use of resources, errors in reports and information, and so forth. Assessment of internal controls in the supply accountability area was not performed at the New Cumberland Army Depot. The TACOM's most recent annual statement on internal controls—September 1986—was based on self-assessments made by the chiefs of the various divisions. These assessments for all divisions rated program vulnerability in the inventory accountability area as a low risk area. We, on the other hand, found inventory accuracy at the depot to be a major area of vulnerability. The specific areas of supply accountability that exhibit vulnerability include accuracy of inventory records, research to identify the causes of the inaccuracies, and physical control over the inventory items.

Our Assessment of Wholesale Inventory Accuracy

Because most of the items inventoried by the depot are selected on a nonstatistical basis or on a basis of a known or indicated problem, the inventory results do not represent the universe of items stored at the depot.

To obtain an accurate measure of TACOM's inventory effectiveness, we selected a stratified statistical sample of 330 TACOM-managed items at New Cumberland Army Depot and did a physical inventory of these items. The results of our inventory, when projected to the universe of TACOM items at the depot, indicate that the recorded inventory balances for 56 percent of the items did not agree with the physical counts. These inventory inaccuracies represent a dollar variance ranging from 0.6 percent to almost 40 percent, and a unit variance rate ranging from 0.6 percent to 36 percent depending on the item's unit price.

Unscheduled Inventories Detract From Obtaining a Representative View of Inventory Accuracy

Most of New Cumberland's depot inventory efforts are devoted to unscheduled inventories which are necessitated by discrepancies between depot custodial records and ICP accountable records. As a result, the time and resources available to perform scheduled inventories of other items is minimized. Items selected for scheduled inventories are generally controlled items and those determined by the demands for an item, with the more active items being selected first. The depot considers an item active if three or more demands are received for the item during the year.

Table 3.1 shows that the total number of inventories performed has decreased. Furthermore, New Cumberland's scheduled inventories, as a percent of total inventories completed, have decreased and unscheduled inventories as a percent of total inventories completed have increased significantly over the past several years. The fact that the depot's inventory efforts are spent primarily in performing unscheduled inventories is, in itself, an indication of inventory inaccuracy problems. Furthermore, not performing scheduled inventories contributes to TACOM not having a representative understanding of its inventory accuracy.

Table 3.1: Inventories Completed at New Cumberland (scheduled and unscheduled) 1984-86

Fiscal year	Inventories completed	Scheduled		Unscheduled	
		Number	Percent of total	Number	Percent of total
1984	113,096	45,462	40.2	67,634	59.8
1985	79,579	24,658	31.0	54,921	69.0
1986	44,579	3,764	8.4	40,815	91.6

Record Accuracy Problems Affect All Dollar Stratas

TACOM computes two record accuracy rates for measuring its inventory management effectiveness. The first is initial record accuracy which compares the number of records not requiring any adjustment to the total number of item records examined.

The second indicator is the adjusted record accuracy indicator which measures the number of records not requiring an adjustment of more than \$800 to the total number of item records examined.

Initial Record Accuracy

For fiscal year 1986, TACOM recorded an initial record accuracy rate of 30 percent for New Cumberland. In other words, 70 percent of the records examined required some adjustment. The poor accuracy rate reflects that 91 percent of the inventories were unscheduled and thus the result of a known or indicated problem.

Our sample results showed a higher initial record accuracy rate. For the 330 items inventoried, the on-hand balance did not agree with the recorded balance for 183, or about 56 percent of the items—an initial record accuracy rate of 44 percent. (See table 3.2.) It would be expected that our sample results would show a higher record accuracy rate than the TACOM computed rate, because our sample represents all TACOM items at the depot, whereas, TACOM's computed initial accuracy rate was based on problem items.

Table 3.2: Initial Record Accuracy Rate for Sample Line Items by Unit Price

Unit price	Sample Items	Items with		Total gains/ losses	Percent of accurate records
		Gains	Losses		
\$0 - \$100	225	59	74	133	40.9
\$100.01 - \$500	43	14	9	23	46.5
\$500.1 - \$1,000	18	6	3	9	50.0
\$1,000.1 - \$10,000	19	3	0	3	84.2
\$10,000.1 - \$50,000	10	2	2	4	60.0
Over \$50,000	15	4	7	11	26.7
Total	330	88	95	183	44.5

Table 3.3 and appendix III show that when the sample results are projected to the universe of TACOM-managed items stored at the depot, the inventory records for 13,391 of the 23,803 line items are in error.

Table 3.3: Projected Record Inaccuracy for TACOM-Managed Line Items at New Cumberland

Unit price	Universe of items	Items with		Total gains/losses	Percent of accurate records
		Gains	Losses		
\$0 - \$100	18,737	4,913	6,162	11,075	40.9
\$100.01 - \$500	3,185	1,037	667	1,704	46.5
\$500.1 - \$1,000	820	273	137	410	50.0
\$1,000.1 - \$10,000	943	149	0	149	84.2
\$10,000.1 - \$50,000	103	21	21	42	59.2
Over \$50,000	15	4	7	11	26.7
Total	23,803	6,397	6,994	13,391	43.7

Adjusted Record Accuracy

For fiscal year 1986, TACOM reported an adjusted accuracy rate of 90.9 percent. In computing this rate, the Army, in accordance with DOD policy, considers all adjustments of \$800 or less as minor adjustments, and for record accuracy purposes, counts them as accurate records.

We believe the adjusted record accuracy rate is incomplete as a basis for gauging inventory management effectiveness because it excludes all inaccurate records where the variance is \$800 or less. Some lesser cost items are just as important in maintaining operationally ready equipment as the more expensive items.

Dollar Variance Indicates Problems With High-Dollar Items

The Army compares the value of inventory adjustments for the items inventoried to the average value of the inventory on-hand. Using this measurement technique, TACOM reported a zero gross adjustment rate as compared to the Army's goal of 6 percent. However, as discussed earlier, the gross adjustment rate is misleading for two reasons. First, it is based on an inflated average inventory balance rather than the value of items inventoried. Secondly, the adjustments (gains and losses) do not include accounting errors or accounting reversals. In TACOM's case, these amounted to almost \$366 million in fiscal year 1986. Therefore, TACOM's reported rate does not reflect the magnitude of dollar inaccuracies existing in its inventory management practices.

The Army also computes a dollar variance based on the ratio of the value of inventory adjustments to the value of items inventoried. For fiscal year 1986, TACOM reported \$4.5 million of inventory adjustments for its items at New Cumberland. These inventoried items were valued at \$90 million; thus, the dollar variance would be 5 percent. However,

the reported inventory adjustments did not include \$28 million of accounting reversals and accounting errors. If they had been included, the dollar variance would have been about 36 percent.

Our stratified sample showed a dollar variance for records examined that ranged from 0.6 percent to about 40 percent with higher priced items having the larger percent of variance. When the sample results are projected to the universe of items, the dollar variance ranged from about \$550,000 to about \$11.7 million and generally increased as the unit price increased. (See table 3.4 and app. III.) This is in contrast to record accuracy variances which were fairly well distributed among the various unit price stratas.

**Table 3.4: Dollar Variance by Unit Price
for TACOM-Managed Items at New
Cumberland**

Dollars in millions			
Unit prices	Recorded inventory value	Percent of dollar variance in sample	Projected dollar variance ^b
\$0 - \$100	\$146.5	2.9	\$4.22
\$100.01 - \$500	103.2	7.0	7.24
\$500.01 - \$1,000	40.9	14.8	6.06
\$1,000.01 - \$10,000	91.1	0.6	0.55
\$10,000.01 - \$50,000	46.3	25.2	11.68
Over \$50,000 ^a	25.0	39.9	9.98
Total	\$453.0		

^aAll items with a unit price of \$50,000 or more were reviewed. Therefore, the values shown are actual rather than projected.

^bThe projected dollar variance for each price strata should be considered a separate entity. The projected variances should not be summed as the total variance for the universe of items

Unit Variance Shows Results Similar to Dollar Variance

Unit variance compares the difference between the recorded quantity for the line items and the quantity determined by the physical inventory to the total recorded quantity. Similar to the dollar variance measure, it can give management an indication of the degree of inventory accuracy.

The Army is not required to and does not report unit variance; therefore, we could not compare the results of our computed unit variance (quantity). The other services do use unit variance as another way to gauge inventory effectiveness. We also support the use of unit variance, as it provides management an added perspective on inventory management effectiveness.

The results of our sample when projected to the universe of TACOM-managed items at New Cumberland showed a unit variance that ranged from 0.6 percent to 36 percent with the higher priced items having the larger percent of variance. (See table 3.5 and app. III.)

**Table 3.5: Unit Variance by Price for
TACOM-Managed Items at New
Cumberland**

Unit price	Recorded quantity	Percent of unit variance in sample	Projected quantity variance ^b
\$0 - \$100	20,570,668	5.0	1,029,506
\$100.01 - \$500	561,704	7.3	41,030
\$500.01 - \$1,000	60,511	15.9	9,602
\$1,000.01 - \$10,000	38,497	0.6	232
\$10,000.01 - \$50,000	3,109	28.9	899
Over \$50,000 ^a	239	36.0	86
Total	21,234,728		

^aAll items with a unit price of \$50,000 or more were reviewed. Therefore, the quantity variance is actual rather than projected.

^bThe projected quantity variance for each price strata should be considered a separate entity, and should not be summed as the total variance for the universe of items.

What is evident from analyzing the various indicators is that no one indicator is the best measure of inventory management effectiveness. The indicators must be analyzed collectively, otherwise, management could be misled as to where to emphasize improved inventory management. For example, record accuracy indicates problems across the board; whereas, dollar and unit variance indicates problems with the higher dollar value items. Furthermore, as in our sample, a relatively few items may have a disproportionate effect on the unit and dollar variance rate. The key is for management to have a representative view of the inventory through the use of various indicators, so that it can better assess the effectiveness of its inventory management efforts and determine where it should apply corrective action.

Inventory Accuracy and Causative Research Need to Be Improved at the Retail Level

The Army has many of the same inventory management problems at the retail level as it does at the wholesale level. Also, as with the wholesale level, little or no causative research is done to identify the basic causes of inaccurate inventory records.

Inventory Records and Reports Are Often Inaccurate and Incomplete

Army regulations define inventory accuracy as the ratio of total number of lines inventoried without major adjustment to the total number of lines inventoried. At the retail level, a major adjustment is one where the inventory variance is \$25¹ or more. The Army's inventory accuracy goal is 90 percent. Our review at the 4th Infantry Division and the Installation Supply Activity at Fort Carson, Colorado; the 25th Infantry Division in Hawaii; and the 3d Armored Division in Germany, showed that in most instances the supply activities did not meet the Army's goal.

4th Infantry Division

A September 1986 wall-to-wall inventory by the 4th Infantry Division of 7,836 items valued at more than \$5 million, showed an inventory accuracy rate of 81.7 percent and inventory adjustments of \$2.6 million (\$1.7 million of gains and \$0.9 million of losses). The computed inventory accuracy rate was overstated because not all items found² during the inventory (about \$941,000) were considered in the computation. According to unit officials, found items for which the unit does not have an inventory card are not considered in computing record accuracy. Information which would allow us to determine the number of inventory records represented by the found items was not available. Therefore, we could not determine what the record accuracy rate should have been.

Inaccurate inventory records were also a contributing factor to the amount of excess materiel at the 4th Infantry Division. About \$350,000 of the inventory gains and about \$242,000 of the items found during the inventory were declared excess.

¹Army regulation 710-2, dated November 24, 1986, changed the value to \$50. The records we reviewed were subject to the \$25 criterion.

²Items classified as found are items not on the units' inventory records, or items at locations not indicated on the records. These items are not included in the inventory gains.

Fort Carson Installation Supply Activity

Annual wall-to-wall inventories are done for items managed by the installation supply activity at Fort Carson. The installation supply activity reported inventory accuracy rates of 95.8, 94.1, and 94.3 percent for fiscal years 1984 through 1986.

These reported rates would seem to indicate that the installation supply activity's inventory records are accurate. However, our analysis showed that the rates were overstated because many inventory variances are excluded from the accuracy rate computation. Army regulations specify that all inventory gains and losses over \$25 are major discrepancies and should be included in the computation. However, the Standard Army Intermediate Level Supply (SAILS) system which is used to compute the accuracy rate at the installation level is programmed to consider only inventory variances of \$200 or more as a major discrepancy. Therefore, variances between \$25 and \$200 are not included in the computation. We could not determine the number of inventory variances that fell within this range because the data needed to make this determination was not available. Consequently, the extent of the accuracy rate overstatement is not known. Because SAILS is used Army-wide for installation supply activities, the higher dollar threshold was used to develop reports of inventory accuracy by other installation supply activities.

In addition, we found that Fort Carson does not make inventory adjustments for inventory losses of \$25 or more until causative research has been completed. This is in conflict with Army regulations which require that physical inventory adjustments be made promptly after completing the physical inventory with causative research³ to be done later. Because of time constraints, causative research was not completed for 530 variances identified during the 1986 annual inventory and about 800 inventory variances during the 1985 inventory. These variances were disregarded in determining the record accuracy rate. Equally important is the fact that the inventory records were out of balance for the entire period and the supply activity managed the inventory based on the inaccurate records.

The installation's accuracy rate was also overstated because other inventory variances were not considered in the inventory accuracy rate computation. To illustrate, variances were ignored for such reasons as

- a prior year's gain was reversed rather than posting an inventory loss for the current year,

³ At the retail level, causative research is required for all inventory variances of \$500 or more.

- inventory losses were assumed to be invalid and offset by issues that had not been posted to the records, and
- materiel not located during the inventory was located at a later date,

We could not determine the extent that the above matters inflated the units' reported inventory accuracy rates.

3d Armored Division

Since November 1985 the 3d Armored Division completed a total of 15 semiannual inventories of its repair parts at the Division's 6 Direct Support Units.

Table 4.1 shows the number of inventories done at each location, the range of reported inventory accuracy rates, and the number of times the inventory accuracy rate exceeded the Army's goal of 90 percent.

Table 4.1: Inventories Done and Range of Accuracy Rates

Location	Number of inventories	Range of reported inventory accuracy rates		Number of times rate exceeded the Army's goal
		Percent		
		High	Low	
Primary Supply Activity	2	72	68	0
1st Forward Support Battalion	3	92	67	1
2d Forward Support Battalion	2	73	70	0
3d Forward Support Battalion	2	77	72	0
Missile	3	87	82	0
Aviation	3	83	77	0
Total	15			1

Our review showed that the 3d Armored Division's reported inventory accuracy rates were overstated because the accuracy rates did not take into consideration the number of items found during the course of the inventory. For example, during a June 1986 inventory at the Division's primary support activity, 1,239 line items were found for which stock records had not been established.

In addition, the Division's six Direct Support Units experienced significant inventory adjustments. These adjustments totaled about \$39 million in 1986, and most of them related to the Division's primary supply activity. Table 4.2 shows the inventory adjustments (gains and losses)

for each supply activity and whether the adjustments related to the semiannual or other special⁴ inventories.

Table 4.2: Inventory Adjustments During 1986 for the Six Direct Support Units

Dollars in thousands

Location	Semiannual Inventories		Special Inventories		Total	
	Gains	Losses	Gains	Losses	Gains	Losses
Primary Supply Activity	\$10,510	\$6,898	\$11,128	\$7,892	\$21,638	\$14,790
1st Forward Support Battalion	144	34	0	0	144	34
2d Forward Support Battalion	142	62	0	0	142	62
3d Forward Support Battalion	58	66	0	0	58	66
Missile	703	577	0	0	703	577
Aviation	436	331	0	0	436	331
Total	\$11,993	\$7,968	\$11,128	\$7,892	\$23,121	\$15,680

Causative Research Is Incomplete and Not Used to Identify Underlying Causes

Army Regulation 710-2 provides that causative research will be done for all inventory variances involving sensitive items and other inventory variances over \$500. Causative research is considered complete when the cause of the inventory imbalance has been determined, or when no conclusive explanation for the variance can be determined after researching all transactions back to the previous inventory.

The retail supply activities we reviewed had done little or no causative research and the causative research that was being done did not result in identifying the specific reasons for the variances. This lack of specificity effectively limited development of corrective actions.

4th Infantry Division

The 4th Infantry Division's plan is to do causative research on all inventory adjustments over \$500. However, a considerable backlog of variances to be researched has developed since the last inventory in September 1986. As of April 1987, causative research had not been performed for 542 inventory variances that exceeded the \$500 threshold.

When the causative research is completed, a brief description of the results is included in the inventory adjustment report. However, results are normally stated in general terms and do not identify the specific reasons for the inventory variance. Consequently, corrective actions to

⁴Special inventories are inventories performed for various reasons such as material release denials, or at the request of the item manager to insure accuracy of the stock records.

resolve the problem are difficult to develop. A typical reason cited for a variance is, "Shortage due to normal issue and receipt processing."

The 4th Infantry Division does not track its causative research results to identify trends. As a result, the Division does not know where corrective efforts should be concentrated.

**Fort Carson Installation
Supply Activity**

The installation supply activity's procedure provides for researching all inventory variances of \$25 or more. However, very few of the inventory variances from the 1986 inventory were researched.

When the inventory variance is a gain, the inventory balance is adjusted. However, when the inventory variance is a loss, the inventory balance is not adjusted until causative research is completed. The installation decided that it could not complete the causative research for the 530 inventory losses identified in the 1986 inventory before it was time to take the next inventory.

For the most part, the causative research that is performed is for the purpose of reconciling the inventory variance rather than determining the cause of the variance. The installation does not track the types of recurring causes, and cannot determine what actions need to be taken to solve the inventory variance problems.

25th Infantry Division

The 25th Infantry Division is not performing causative research for all inventory adjustments over \$500. For example, the 1986 inventory at the Division's primary supply activity resulted in 563 variances over \$500 (367 gains and 196 losses). Causative research was performed for only 2 percent of the gains and 20 percent of the losses.

The causative research that was performed was insufficient to identify the specific reasons for the gains and losses. Research consisted mainly of examining the monthly transaction register for obvious errors and did not consider other sources such as receipts and reports of discrepant shipments. For example, the Division concluded that the loss of 70 automotive batteries was due to "numerous condition code changes." Condition code changes do not result in losses.

3d Armored Division

At the 3d Armored Division, causative research was performed on 50 percent of the 750 inventory variances resulting from the June 1986

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inventory at the Division's primary support activity. According to the accountable officer, there are insufficient personnel to perform the needed research.

The causative research that was performed generally lacked specificity in identifying the underlying causes for the inventory gains or losses. For example, the reason given for many of the variances was failure to post receipts. However, the systemic reasons that caused the receipts not to be posted were not identified. Consequently, corrective actions to solve the problem could not be developed.

Improved Physical Security Is Needed to Safeguard Inventory Supplies, Including Sensitive Munitions

Sound physical security is essential to protect inventory items from loss due to theft. Our review disclosed numerous instances where physical security was inadequate to afford proper protection. The physical security deficiencies applied not only to repair parts, but also to sensitive missiles which could be targets for theft by terrorists and other dissident groups. The range of security deficiencies included inadequate and improper storage facilities, inoperative detection devices, poorly equipped and trained guards, and poor accountability for and control over sensitive items. Many of these type deficiencies are longstanding problems and have been the subject of various DOD studies and reports.

The following types of security deficiencies were noted during our visits to the 25th Infantry Division in Hawaii and at eight battalions in four divisions in Germany.

25th Infantry Division

The 25th Infantry Division's storage facilities did not meet many of the Army's minimum physical security standards. Our inspection of the storage facilities identified numerous security deficiencies such as:

- holes in the exterior walls of the facility that would allow easy access;
- improperly secured doors and doors that did not meet minimum structural standards;
- ground floor windows that were not barred, grilled, or covered with chain link material; and
- a gate to the bulk storage yard that could be entered easily because it was about 3 feet above the ground at one end.

In addition, access control procedures were not being used at certain storage locations and we found no evidence to indicate that access to these areas was restricted. Also, controls over pilferable-coded repair parts at certain locations were inadequate. At one location, 48 of 89 pilferable-coded repair parts were stored in an open warehouse while many non-controlled repair parts were stored in a protected area.

Physical security inspections, required by Army regulations, should have disclosed these deficiencies. However, only one of the four division storage facilities had been inspected, and the inspection report, dated October 27, 1986, did not cite many of the deficiencies we found. According to the Physical Security Chief, all storage facilities were not inspected because the Division had not identified all locations on its list of mission essential and vulnerable areas.

At our request, a physical security specialist inspected the four storage facilities. A February 6, 1987, report which documented the results of these inspections pointed out many of the same type physical security deficiencies that we identified during our inspections.

3d Armored Division

The Division's storage facilities had numerous physical security weaknesses such as:

- Highly pilferable parts such as tires, batteries, and electronic parts (valued at \$175,000) were stored in tents that had holes in their side walls that offered easy access.
- The main warehouse which contains repair parts valued at about \$15 million was easily accessible. During the day, access to the storage bins and compartments was not restricted. After hours, the warehouse could be entered through a poorly secured door.
- Control of keys to warehouse doors, storage cages, and vans was inadequate. Despite a 1986 inspection which also noted this problem, a key custodian had not been designated, the key register was out of date, and there were no indications that the keys were being inventoried.

Accountability and Control Over Sensitive Munitions

Army regulations prescribe that sensitive munitions be stored in earth covered bunkers with steel doors and that the facilities be protected by intrusion detection systems and guards. Deviations from prescribed security methods can be compensated for by increased surveillance. At the locations visited where security deficiencies were observed, compensatory measures either were not in place or were not effective. The regulations also require that the sensitive munitions be inventoried monthly and that the items be accounted for by serial number.

Our review at eight battalions in four divisions in Europe disclosed serious physical security and serial number control problems. We performed a physical inventory of 13 sensitive munitions types and compared the inventory results to the amounts shown on the accountable records. In total, we inventoried 29,615 individual items of which 5,027 were required to be controlled by serial number. We also reviewed physical security measures at nine ammunition storage locations which support the eight battalions.

Sound Inventory Control Procedures Over Sensitive Missiles Not Followed

The battalions had the proper quantities of munitions; however, serial numbers for 807 of the 5,027 missiles (about 16 percent) which are required to be controlled by serial number did not agree with the serial numbers recorded on the units' property books.

We determined that about 20 percent of the 807 discrepancies could be attributed to administrative errors such as failing to post receipt of the missiles to the units' accountable records, or the units' incorrectly posted the serial numbers to their records. In the remaining 80 percent of the cases, we could not determine the reasons for the discrepancies and unit officials had not been able to determine the reasons at the time we completed our field work in April 1987.

The seriousness of what can happen when serial number control is lost can best be demonstrated by the following examples:

- In 1986, the U.S. Army Missile Command requested that 24 Stinger missiles in Europe be located so that they could be test fired. The missiles were identified by individual serial numbers. The request was sent on September 19, 1986, and the units were supposed to respond by October 27, 1986. However, it was not until August 1987, that all the missiles were located.
- In March 1986, a battalion lost a Chaparral training missile. The investigating report concluded that the unit had failed to maintain serial number accountability over its missiles and had routinely swapped missiles with other units for training exercises. In an effort to locate the missing Chaparral, the commander of the unit began calling all Chaparral battery commanders in the U.S. Army, Europe. The commander eventually located one unit which had acquired an extra missile and was willing to transfer it to the commander's unit. Although the serial number of the missing missile did not match with this missile, the commander stated that

"it is still possible that it is ours because of the inexact manner in which the . . . serial numbers were tracked in the past."

The investigating report agreed with the commander's assessment that the replacement missile be accepted.

Army regulations require that monthly inventories be performed for all serial numbered controlled items. If these requirements had been met, the serial number control problems could have been identified. We found, however, that at six of the eight locations visited, the required

serial number inventories had not been performed during the past 12 months. The other two had performed some but not all of the required inventories. Furthermore, in about 54 percent of the cases, there were no indications that inventories to determine the quantity of items on hand were being done.

A number of other problems with the accuracy and completeness of the property books and supporting documents were also noted. For example, supporting documents for 1,500 of the 5,027 missiles inventoried could not be located by the battalions. Supporting documents, such as hand receipts, are needed to show the receipt and transfer of missiles. In the absence of these documents, it is not possible to determine that the missiles on hand are the same missiles that were shipped to the unit.

In another case, a battalion lost its property book. The unit had 360 TOW and 108 Dragon missiles on hand. However, we could not verify the serial numbers or insure that the existing quantities were correct. The unit was attempting to reconstruct its property book, but was having difficulty doing so, due to the lack of necessary supporting documentation.

Security at Storage Sites Does Not Meet Requirements

Army security inspectors had previously rated physical security as "poor" at five of the nine ammunition storage sites we visited. Additionally, at one other site not inspected by Army security inspectors, we considered physical security to be "poor" based on Army inspection criteria. One of the more significant problems noted was the need for improvements to storage facilities. Four of the sites were storing missiles and other sensitive ammunition in structures that did not meet physical security requirements. For example:

- Stinger missiles were stored in lightweight corrugated metal sheds with the word "Stinger" stenciled on the side.
- Antitank rockets were being stored in similar type sheds, with doors that had to be propped shut because of broken locking mechanisms.
- Dragon and TOW missiles were stored in tractor trailers and on open concrete storage pads in plain view of persons outside the storage perimeter.
- Antitank rockets and hand grenades were stored in small, rusting, lightweight metal sheds.

Other security problems included poor communications and lighting, holes in some fences, gates which could be lifted off their hinges, inadequate inner and outer clear zones, and no designated response force. In addition, 78 percent of the storage structures did not have intrusion detection systems or the systems were not functioning properly.

Problems with civilian guards were also noted in Army inspection reports and during our visits to the storage locations. The more common problems were invalid or nonexistent background checks, failures to qualify in the proper handling of firearms, lax entry controls, inadequate numbers of guards, failure to man guard posts, and failure to check storage bunkers on time.

The following illustrates what we found during our visits to the various sites and what Army officials found during their inspections.

- At one location, the guard force was inside the guard shack instead of patrolling the area. This was the second occurrence of this type within a month.
- A later inspection found a guard absent from the guard post, and a note was affixed to the door which stated "Be back in 5 minutes." This same site was subsequently inspected by the V Corps Internal Review Office. Their inspection concluded that the guards were not properly equipped, the majority of them had not completed the required training, 14 guards did not have the required police background check, and some guards were allowed to work 24 to 36 hours continuously. Another inspection by Provost Marshal security inspectors found four of the six guards in the guard shack; two of whom were playing cards. The remaining two guards could not be found and could not be contacted by radio.

Recent reports have cited instances where munitions, like those we inventoried, have been diverted. According to Army officials, the military source and amount of diverted ammunition oftentimes cannot be determined, because accountability and security problems makes it difficult to identify the source of the ammunition when it is found.

Officials of the Divisions we visited said they planned corrective actions to address the accountability issues discussed in this report. The actions planned include rewriting operating procedures, issuing policy letters, and clarifying requirements pertaining to the accountability and control over sensitive munitions. In addition, several of the Divisions are having ammunition inspectors conduct ammunition management reviews to determine the adequacy of the security procedures.

The U.S. Army, Europe has long recognized the security problems it has because of poor physical facilities. In our 1982 report, DOD Has Serious Problems With Care and Maintenance of Conventional Ammunition (PLRD-82-27, Feb. 9, 1982), we pointed out that existing storage space in Europe was deteriorating and inadequate. In response to the report, U.S. Army, Europe developed a list of storage sites needing improvements, but at the same time recognized that the command had no major program to provide sufficient funding for the upgrade of older facilities or for annual recurring maintenance of both older and newer facilities. As a result, the backlog for upgrade continues to grow and all required annual maintenance is not being performed.

A June 1983 report by the DOD Office of Inspection General also identified insufficient and inadequate storage facilities for ammunition and explosives. The report pointed out that under Army policy, responsibility for identifying and funding needed physical security upgrades rests with the local commands and that it did not appear that physical security upgrades received as high a priority as other mission responsibilities. The report also stated that health, welfare, and troop morale projects were consistently afforded higher priority than physical security projects.

The Inspector General recommended that a separate budget appropriation line be established for physical security of ammunition and explosives. DOD agreed with the recommendation, but did not change its policy. However, the Army did not agree with it. The Army stated that major commands are given the resources which are then allocated to the installation to carry out the responsibilities assigned to them and that installation commanders should have the authority to make decisions based on established priorities and availability of resources.

The Inspector General responded to the Army's comments by stating that the "bottoms-up" approach has resulted in the non-uniform application of resources to upgrade physical security and to accomplish the needed upgrades, priorities and funding levels must be established on an Army-wide basis.

Conclusions and Recommendations

Conclusions

Army and DOD management is not fully aware of the extent of inventory inaccuracies existing at the wholesale and retail levels. The reported statistics on inventory management effectiveness are misleading because the Army has broadly interpreted the intent of DOD's policy guidance. As a result, management decisions concerning what and how much to procure and what is needed to adequately support the forces are based on less than complete and accurate information. The primary indicators used by the Army for measuring effectiveness—record accuracy and gross adjustment rate—exclude hundreds of millions of dollars of inventory adjustments that the Army classifies as accounting reversals and accounting errors. By excluding these adjustments, the record accuracy rates are overstated and gross adjustment rates are understated. Furthermore, the Army does not know the extent of its inventory inaccuracies or what these inaccuracies represent in terms of dollar value or quantity of items.

Compounding the problem of not knowing the extent of inventory accuracy is the fact that the Army does not know what is causing the variances found. Causative research, which is intended to ultimately identify the systemic causes so that corrective actions can be developed, is either not being performed or being performed ineffectively. When done, the results of causative research are not being aggregated to identify systemic problem areas. In the absence of such information, the same problems will continue to occur and their underlying causes will remain unknown.

The Army needs to develop a better system to gauge the overall effectiveness of its inventory management process. One such method would be to apply statistical sampling. Using this technique, the Army could select a stratified random sample of items, either by ICP or depot, and perform a physical inventory of these items. This method would allow management to obtain a representative view of all of its inventory, and managers could then evaluate overall effectiveness using various indicators to identify those inventory management areas needing improvement. The sampling technique would further allow Army management to compare and evaluate the performance of its ICPs and depots.

Another factor that compounds the inventory accuracy problem is poor physical security at some facilities for safeguarding the inventory from theft and diversion. Poor physical security at some facilities is due, in part, to a situation which places the responsibility for setting priorities and allocating resources on the major commands. As such, facility

improvements at some installations must compete with other operational and quality of life requirements for limited resources, and funding for physical security upgrades often receives a lower priority.

Collectively, the problems of inaccurate inventories, unknown causes of the inaccuracies, and poor physical security all contribute to a situation where the Army is unnecessarily vulnerable to theft, diversion, or misappropriation of its inventory supplies. These management weaknesses should have been recognized and reported to higher organizational levels in the Army and reported as part of its internal controls program.

Finally, many of these same problems were previously reported by us and others over the past several years. Based on this review, it is apparent that promised actions to correct the problems have not been fully effective. In view of the problems discussed in this report, we believe it is time for the Army to revisit these prior recommendations and renew its commitment for correcting these problems.

Recommendations

We recommend that the Secretary of the Army direct the inventory managers to

- perform a physical inventory of all variances disclosed by comparing the accountable and custodial records, and use the results of the inventory as the basis for making inventory adjustments;
- report all variances between physical inventories and accountable records and use the reported variances in measuring inventory management effectiveness;
- develop an inventory methodology, such as statistical sampling, which will allow managers to obtain a representative and realistic view of its inventory management effectiveness based on indicators such as dollar and unit variance, as well as initial record accuracy; and
- reemphasize the need for effective causative research that identifies the causes for the inventory variances and tracks the causes over a period of time to identify systemic problem areas. An alternative to the current procedures would be to statistically sample the variances and do the necessary in-depth research to identify the causes of the variances.

We also recommend that the Secretary of the Army,

- as an alternative to the current process for allocating resources, establish a separate budget line for physical security of its inventories so that it can have better visibility of the progress toward making needed

upgrades of facilities, equipment, and personnel rather than leaving it up to the major commands and installation commanders to decide how the resources should be allocated;

- reexamine the previously planned corrective actions shown in appendix I and determine why these actions have either not been taken or why they have not resulted in improved inventory management; and
- report the internal control weaknesses discussed in this report, along with a corrective action plan, in the Army's next annual Financial Integrity Act statement.

Agency Comments and Our Evaluation

DOD agreed with four of our recommendations and partially agreed with the other two, and proposed a plan of action for implementing the intent of each recommendation. DOD partially agreed with our proposed recommendation in the draft report and stated that total turbulence in the inventory records should be measured and reported to management so that inventory management effectiveness can be assessed. However, DOD does not believe that all reversals should be eliminated because there are instances where record errors need to be corrected. DOD said that inventory adjustments, and not accounting errors and reversals, should be used to correct erroneous inventory adjustments that are more than 1 year old or adjustments that occurred prior to the last physical inventory. DOD also agreed that inventory variances that result from erroneous processing and affect the quantity balance on the accountable records must be recorded as record turbulence. We agree with DOD's comments and have modified our first recommendation to clearly focus on the need to identify the total turbulence in inventory records.

DOD advised that a study has been initiated, and is to be completed by December 1987, to assess the current reporting mechanism (Inventory Control Effectiveness Report) and to explore alternative performance measures, data sources, and reporting processes. DOD's proposed action will help ensure that total turbulence in the inventory records is measured.

DOD agreed with our second recommendation on the need for an inventory sampling methodology that would give management a representative and realistic view of its inventory management effectiveness. DOD reissued DOD Instruction 4140.35, dated June 30, 1987, that now requires a random sample inventory, in addition to regular inventories for problem items, to measure overall effectiveness of the inventory control process.

DOD agreed with our recommendation for more effective causative research. DOD stated that causative research, as currently being performed, does not provide benefits commensurate with the resource expenditures. DOD advised that it has initiated a study to recommend policy and procedural changes to improve the effectiveness and efficiency of causative research. As an interim measure, DOD will

- reemphasize the need for effective causative research,
- provide an updated multimedia presentation on how to conduct causative research, and
- prepare an automated system change proposal that will print a checklist to assist each researcher in documenting the findings on each causative research case.

DOD partially agreed with our recommendation for a separate budget line for physical security stating that it continues to believe that a centrally managed program is necessary. DOD noted that the Army has consolidated the bulk of its physical security resources into specific Program Development Increment Packages for security upgrades and enhancements. It further stated that the key is to ensure that funds programmed and budgeted for these packages are used for the specified purposes.

We agree that consolidating the resources into Program Development Increment Packages does increase the visibility of such resources to Army officials and does provide a basis for raising questions when the funds are diverted for other purposes. However, this process has been in effect since 1983 and the overall situation has not been remedied. If a separate budget line was established at the DOD level, the resources would be more visible to higher management level, and the tendency to divert the funds to other purposes might be reduced. Therefore, we continue to believe that our recommendation remains valid.

DOD agreed with our recommendation on the need to reexamine previously planned corrective actions. It stated that the Army will complete a review, by November 1, 1987, to ensure that corrective actions are proceeding in accordance with approved milestones.

DOD also agreed with our recommendation that the Army include internal control weaknesses, along with a corrective action plan, in its next Financial Integrity Act Statement.

Current Status and Our Evaluation of DOD's Actions on Our Recommendations in the November 1983 Report¹ on Inventory Accuracy

Recommendation	DOD Action	Current Status and our Evaluation
Recommendation 1. Adopt on a DOD-wide basis, the following actions taken by the Navy to improve physical inventory control and inventory record accuracy:		
(a) Recognize inventory record accuracy as a major concern and upgrade the command priority and emphasis given to physical inventory programs.	DOD concurred. The Office of the Secretary of Defense (OSD) issued a memorandum on July 12, 1983, that reemphasized to the DOD components the importance of increasing management attention to inventory control. In May 1986, DOD requested that the Army develop a DOD-wide physical inventory control training course.	Based on the results of our May 1986 briefing report to Sen. Pete Wilson and the results of this review, we do not believe the Army has given the proper command priority and emphasis to physical inventory programs.
(b) Require that merit pay objectives/ performance evaluations of military and civilian personnel involved in functions affecting inventory record accuracy include a mandatory entry on inventory record accuracy and materiel accountability performance.	DOD concurred. OSD issued appropriate instructions to the components in July 1983. This requirement is stated as policy in DOD Instruction 4140.35 dated June 30, 1987. At the time of the DOD audit none of the components' evaluation processes had used these mandatory entries enough for the auditors to draw a conclusion regarding their effectiveness, although the Army had progressed to the point of making the entries on the appropriate ratings.	We did not examine personnel rating during this review. Therefore, we cannot comment on the appropriateness of DOD's actions.
(c) Have top management provide clear guidance to depots and inventory managers that falsifying reporting of physical inventory performance and inventory accuracy results will not be tolerated and that, if found, the strongest disciplinary actions will be taken.	DOD concurred. OSD issued a statement to the components in July 1983 that reiterated the responsibility of logistics managers to ensure the accuracy of reported data on inventory control. The OSD response also stated that OSD would reemphasize to the components the requirement for accurately reporting physical inventory performance and inventory accuracy results.	DOD's actions are appropriate. We found no evidence of falsified inventory reports during this review.
(d) Identify the training needs of depot and inventory control point supply personnel and see that the training is provided.	DOD concurred. As of September 1984, OSD representatives were pursuing this initiative with representatives of the components to determine whether existing Army programs of instruction could be used as a basis for instruction in the other components.	During this review we found training was limited primarily to that associated with on-the-job training. For example, at TACOM we found training courses were not given because they had not been updated since 1982.

(continued)

¹Navy's progress in improving physical inventory controls and the magnitude, causes, and impact of inventory record inaccuracies in the Army, Air Force, and Defense Logistics Agency (GAO/NSIAD-84-9, Nov. 4, 1983).

Appendix I
Current Status and Our Evaluation of DOD's
Actions on Our Recommendations in the
November 1983 Report on
Inventory Accuracy

Recommendation

(e) Establish standard rewarehousing procedures that at a minimum will (1) limit the amount of materiel movement to the lowest possible level, (2) provide standard materiel movement controls to ensure that materiel location changes are reflected promptly on depot locator records, and (3) require that either quality sampling checks or complete location surveys be made following rehousing projects to insure that the new locations of rewarehoused materiel are reflected promptly and accurately on locator records.

DOD Action

DOD concurred. As of September 1984, representatives of OSD and the components were working to develop appropriate policy language to incorporate in DOD instruction 4140.35 and related procedural instructions to include in DOD 4140.22-M. DOD Instruction 4140.35 was reissued June 30, 1987. Military Standard Requisitioning Procedures standard 114 which was issued for comment in March 1987.

Current Status and our Evaluation

We did not examine rewarehousing as a part of this review. Therefore, we have no comments on the recommendation or current status of DOD's actions.

Recommendation 2. Expand the frequency and scope of quality control checks of work processes affecting inventory record accuracy at both depot and inventory management levels. At a minimum, expanded quality control programs should include weekly sampling checks of the quality of research efforts to identify and correct recurring error causes, as well as the validity of reconciliations of major physical inventory differences and reversals of physical inventory adjustments. Also, require that quality control results be reported to depot and inventory control point commanders and higher management levels and that a feedback system be established to ensure that problem areas repeatedly noted by quality checks are corrected promptly.

DOD concurred, although part of the corrective action described in DOD's response was related to causative research rather than quality control. Inventory control program staff visits in April, May, and June 1987 concentrated on infloat document control, location records, and internal controls.

We found quality control checks at both the ICP and the depot were ineffective or not being accomplished as required. For example, TACOM was not adequately performing quality control checks on the validating of reconciliations of major physical inventory adjustments. (See page 19.)

Recommendation 3. Require inventory management levels to report the results of causative research of physical inventory adjustments to higher management levels and establish a feedback system to ensure that recurring error causes are being identified and corrected. Also require results of causative research to affected depots and have the depots use the results to identify problem areas warranting expanded quality control coverage.

DOD concurred. DOD standard error cause codes have been prescribed. Changes in standard document formats, as a means of transmitting error cause data between DOD components, have been proposed to the components. Consequently, DOD may be able to require that these data be exchanged. DOD initiated a study in August 1987 to evaluate better ways of doing causative research.

The problem continues. We found that causative research was inadequate at all levels. (See page 20).

Recommendation 4. Rescind recent policy changes that (1) increase the time frame for reversing physical inventory adjustments from 90 days to 1 year and (2) increase the dollar criterion for researching physical inventory adjustments for pilferable items from over \$2,500 to over \$4,000.

DOD concurred in the recommendation to rescind the increase of the time frame for reversing physical inventory adjustments, although the DOD has established more stringent conditions for permitting reversals of adjustments. No other DOD action was taken or planned. DOD concurred in the recommendation to rescind the increase of the dollar criterion. This planned change to DOD procedures has been withdrawn.

Although DOD increased its time frame for reversing physical inventory adjustments to 1 year, we believe it should make little difference if inventory managers adhere to the stringent conditions on reversals. DOD criteria prevents reversals of an original adjustment transaction if an inventory has been completed between the date of the original adjustment and the date the reversal is attempted.

(continued)

**Appendix I
Current Status and Our Evaluation of DOD's
Actions on Our Recommendations in the
November 1983 Report on
Inventory Accuracy**

Recommendation	DOD Action	Current Status and our Evaluation
Recommendation 5. Direct the Air Force to comply with the intent of DOD's policy by limiting preadjustment research to reconciliation of physical differences caused by recent unprocessed transactions that occurred immediately before or during the physical inventory control period.	DOD nonconcurred, but did state that there would be a 30-day limit on preadjustment research effective October 1, 1984. As of early September 1984, DOD did not have a plan to implement a 30-day time limit on preadjustment research. The only 30-day limit prescribed in the procedural changes that became effective October 1, 1984, pertained to the maximum amount of time that a release denial could be held in suspense before being posted to the accountable record.	The recommendation does not apply to the Army.
Recommendation 6. Establish uniform standards for gross physical inventory dollar adjustment ratios based on the value of material inventoried. Also, establish uniform standards for reversals of physical inventory adjustments.	DOD initiated a study in March 1987 to evaluate better reporting processes.	Establishing standards would provide a reference point for measuring performance. Our review indicated that standards for reversals, in particular, are needed.
Recommendation 7. Require that reversals to physical inventory adjustments be viewed equally with physical inventory adjustments by DOD and its components in assessing overall inventory record accuracy performance.	DOD concurred and has revised its procedures to require the reporting of reversals starting in FY 1985. The concurrence was qualified to state that although reversals would be visible, they would not be considered to be the same as adjustments.	The results of this review indicated DOD should reconsider its position as to whether reversals should be used in assessing inventory record accuracy performance. (See page 14.)
Recommendation 8. Require inspector general and inventory control review teams in the services and Defense Logistics Agency as a part of their periodic annual inspections, to examine the quality of physical inventory variances and reversals of physical inventory adjustments. Also, require more frequent and in-depth service and Defense Logistics Agency coverage of wholesale physical inventory controls and inventory record accuracy by internal audit organizations.	DOD concurred. A DOD-wide audit was performed in partial fulfillment of this recommendation. This report was issued in August 1985. Each service and the Defense Logistic Agency had review groups whose purpose included reviews of the inventory programs. DOD Instruction 4140.35 now requires the DOD Inspector General to periodically review components' physical inventory controls as an element to be addressed in their annual internal controls assessment.	We continue to support the recommendation for more frequent reviews of the inventory management process by internal and external audit groups and inspectors.
Recommendation 9. Expand DOD's plans to develop procedural requirements and techniques to relate impact of physical inventory adjustments on requirements determination and procurement to include identification of adjustments affecting mission essential items. Also, require that data on physical inventory adjustments affecting requirements, procurements, and mission essential items be reported to DOD and included in the quarterly inventory control effectiveness report.	DOD concurred. In September 1984, the Joint Physical Inventory Working Group was assigned the task of exploring methods of determining the effect of adjustments on requirements computations and procurements. That group was also exploring the feasibility of relating out-of-stock conditions to mission readiness. OSD had not yet established the recommended reporting requirements, because the means of developing the necessary data had not been determined.	Although the issue was not addressed in this review, we believe that DOD's actions have merit and should be continued.

Activities Visited

Headquarters

- Army Materiel Command, Alexandria, Virginia

Wholesale Level

- Tank-Automotive Command, Warren, Michigan
- New Cumberland Army Depot, New Cumberland, Pennsylvania

Retail Level

- Headquarters, 4th Infantry Division and Fort Carson, Fort Carson, Colorado
- Directorate of Logistics, Fort Carson, Colorado
- Division Support Command, Division Materiel Management Center, Fort Carson, Colorado
- Army Western Command, Fort Shafter, Hawaii
- Headquarters, 25th Infantry Division (Light), Schofield Barracks, Hawaii
- Division Support Command, Division Materiel Management Office, Schofield Barracks, Hawaii
- Headquarters, 3d Armored Division, Frankfurt, West Germany
- 3d Armored Division, Division Support Command, Frankfurt, West Germany
- Main class IX common warehouse, Grossauheim, West Germany
- Main missile warehouse, Butzbach, West Germany
- Forward class IX common warehouse, Kirchgoens, West Germany

Our Estimate of the Record Accuracy, Dollar Variance, And Quantity Variance, at a 95-Percent Confidence Level, for TACOM-Managed Items at New Cumberland Army Depot

General Information	Unit Price Strata						Total
	\$0.01 to \$100	\$100.01 to \$500	\$500.01 to \$1,000	\$1,000.01 to \$10,000	\$10,000.01 to \$50,000	Over \$50,000	
Sample line items selected	225	43	18	19	10	15	330
Total universe of line items	18,737	3,185	820	943	103	15	23,803
Inventory value of items (million)	\$146.54	\$103.18	\$40.88	\$91.13	\$46.26	\$25.02	\$453.000
Record Accuracy Rate							
Number accurate records	7,661	1,481	410	794	61	4	10,412
Total record	18,737	3,185	820	943	103	15	23,803
Percent-accurate records	40.9	46.5	50.0	84.2	59.2	26.7	43.7
Sample error-records	493	228	103	141	21	0	577
Dollar Variance Rate							
Estimated dollar difference between actual and recorded inventory value (millions)	\$4.22	\$7.24	\$6.06	\$0.55	\$11.68	\$9.98	
Total recorded inventory (millions)	\$146.54	\$103.18	\$40.88	\$91.13	\$46.26	\$25.02	
Percent-dollar variance in sample	2.9	7.0	14.8	0.6	25.2	39.9	
Sample error-million dollars	\$0.04	\$0.34	\$1.76	\$0.00	\$0.58	\$0.00	
Quantity Variance Rate							
Estimated quantity difference between actual and recorded quantities	1,029,506	41,030	9,602	232	899	86	
Total quantity of items	20,570,668	561,704	60,511	38,497	3,109	239	
Percent-quantity variance in sample	5.0	7.3	15.9	0.6	28.9	36.0	
Sample error-units	26,706	2,191	2,858	0	39	0	

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