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UNITED STATES GENERAL ACCOUNTING OFFICE
INTERNATIONAL DIVISION
EUROPEAN BRANCH

%AMERICAN CONSULATE GENERAL
APO NEW YORK 09757

OFFICE OF THE DIRECTOR

IN REPLY REFER TO:

B-163928

September 14, 1979

General Frederick J Kroesen
Commander in Chief
United States Army, Europe, DLG02800 AGC01494 DLG00452 DLG02801
and Seventh Army
APO U S Forces 09403

Subject [Army management controls over bulk fuel in Germany and Italy] (LCD-79-223)

This report discusses our review of the Army's accounting and management controls over bulk fuel in Germany and Italy We found significant weaknesses in the accounting for and controls over fuel as it moves through the U S Army, Europe, and Seventh Army (USAREUR) distribution system Corrective actions promised by USAREUR officials and implementation of the recommendations in this report should substantially improve the situation

Our review was performed at 15 Army activities storing and dispensing bulk fuel including 5 wholesale supply points and 10 other retail supply and customer activities We talked with responsible officials, reviewed regulations and documents, and participated in taking physical inventories of fuel The review covered the period of operations from October 1977 to February 1979

BACKGROUND

USAREUR activities in Germany receive bulk fuel--motor gasoline, diesel fuel and jet propulsion fuel--through a system of U S and NATO pipelines and storage terminals The fuel, which is procured by the Defense Fuel Supply Center, is delivered by Military Sealift Command tankers to the U S -owned, French-operated petroleum terminal located near Donges, France From there the fuel moves by pipeline across France to one of

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three tank farms (Hinterweidenthal, Bellheim and Huttenheim) located in West Germany. Fuel stored at these activities is transported to the 22 supply points by railcar, barge, or truck In fiscal year 1978, the three tank farms issued 76 million gallons of fuel--27 million gallons of motor gasoline, 35 million gallons of diesel fuel, and 14 million gallons of jet propulsion fuel to the 22 points

In Italy, activities of the U S Army Southern European Task Force--a USAREUR component command--obtain motor gasoline and jet propulsion fuel through the NATO Italian Pipeline System These fuels are delivered by Military Sealift Command tankers to the pipeline terminal at La Spezia, Italy, and are pipelined to storage terminals at Verona and Collecchio, Italy From these terminals the fuels are transported by railcar or truck to the Military Community Activity at Vicenza, Italy, or the Leghorn Army Supply Depot at Livorno, Italy In fiscal year 1978 Vicenza and Leghorn were issued about 535,000 gallons of motor gasoline and 150,000 gallons of jet propulsion fuel. Diesel fuel totalling about 280,000 gallons during fiscal year 1978 was procured by local contract and delivered by commercial transport to Vicenza and Leghorn

OVERVIEW

Army regulations require commanders to properly manage, control, and account for bulk fuels and to pursue aggressive policies for receiving, storing, issuing, and inventorying fuels Additionally, they are required to promptly identify shortages and take prompt action to account for those exceeding allowable losses Although all activities authorized to store and dispense bulk fuels are required to exercise proper accounting for and control over the fuels, we found many instances where this was lacking

We found weaknesses in management controls over transactions and documents, failure to record documents and to properly take physical inventories as well as a lack of knowledge on the part of personnel responsible for controlling fuels We identified over 200,000 gallons of fuel which were either unaccounted for or represented differences between recorded and physical inventories Additionally, in a number of instances information was not readily available or the records were so inadequate that we could not determine with any degree of confidence what should have been the recorded quantities

Furthermore, a majority of the activities reviewed did not have adequate equipment for taking physical inventories and the capacities of storage tanks did not have proper certifications

Additionally, other clerical and procedural discrepancies related to the above issues were noted While these discrepancies were minor in nature, they may be indicators of system-wide weaknesses which could increase opportunities for fuel mismanagement and diversion These findings are discussed in more detail in enclosure I

CONCLUSIONS AND RECOMMENDATIONS

Based on the problem areas disclosed, it is evident that the activities are not controlling and accurately accounting for their fuel Although we did not review all USAREUR fuel storing and dispensing activities, the problems noted may be indicative of weaknesses throughout the bulk fuel accounting system in USAREUR Without better accounting Army managers are not in a position to determine with any degree of reliability whether fuel is being used properly or is being diverted--particularly at the consumer level in a field environment

During field exercises fuel is often unaccounted for and documentation supporting issues is incomplete or not forwarded to the accountable officer Battalion officials said they do not really expect proper accounting in the field and that their most important concern is getting enough fuel--not accounting for it Some officials suggested that the regulations covering accounting for bulk fuel should be relaxed because they impose unrealistic requirements

USAREUR officials agreed that such problems exist and attributed them to a lack of qualified personnel--both officer and enlisted--and funds for equipment and maintenance They stated that their requests for additional personnel and funds have been rejected

Many of the deficiencies found during the review are similar to those on which we have reported previously (see enclosure II) and they could be corrected through improved management and accounting controls However, we believe the situation will not improve significantly unless there is a positive change in the attitude of management toward the importance of properly controlling and accounting for bulk fuel

Recommendations

To improve USAREUR's overall management of the bulk fuel it receives and issues, we recommend that you reemphasize to field commanders the importance of properly accounting for and controlling such fuel in order to reduce the potential for diversion and to insure proper utilization Also, we recommend that you

--Require that all personnel responsible for the receipt, issue, accounting for, or control of bulk fuel receive adequate training in the

  --techniques of and use of equipment for taking physical inventories,

  --preparation, control, and maintenance of documentations,

  --recording and summarization of transactions, and

  --preparation of accountability and discrepancy reports.

--Insure that personnel responsible for performing physical inventories have the necessary equipment to do so

We would like to receive, within 60 days, comments on the final actions taken to correct the problem areas discussed in enclosure I. I appreciate the cooperation and courtesies extended to my staff at each of the locations visited

Sincerely yours,

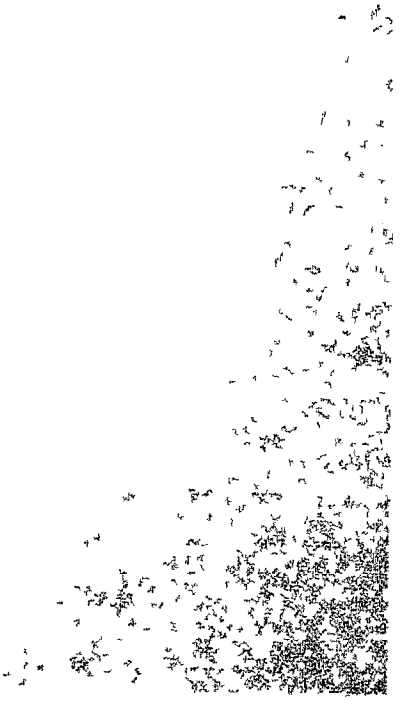
Joseph Eder
Director

Enclosures - 2

cc Department of the Army
ATTN The Inspector General
DAIG-IG
The Pentagon

cc Headquarters
United States European Command
ECCM-F

Assistant for Audit Reports, OASD(C)
The Pentagon



ARMY WEAKNESSES IN MANAGEMENT AND ACCOUNTING FOR FUEL CONTINUES

Army regulations require commanders to properly manage, control, and account for bulk fuels and to pursue aggressive policies for receiving, storing, issuing, and inventorying fuels Additionally, they are required to promptly identify shortages and take prompt action to account for those exceeding allowable losses Although all activities authorized to store and dispense bulk fuels are required to exercise proper accounting for and control over the fuels, we found many instances where this was lacking

We identified over 200,000 gallons of fuel which were either unaccounted for or represented differences between recorded and physical inventories Additionally, in a number of instances information was not readily available or the records were so inadequate that we could not determine with any degree of confidence, what should have been the recorded quantities

Specifically, many activities did not

--properly account for or document fuel receipts and issues,

--perform physical inventories or did not perform the inventories in accordance with prescribed procedures,

--maintain accurate data on storage capacity, thus resulting in an overstatement of the amount of fuel for which they were accountable

Additionally, other clerical and procedural discrepancies related to the above issues were noted While these other discrepancies were minor in nature, they may be indicators of system-wide weaknesses which could increase opportuntiies for fuel mismanagement and diversion These problem areas are discussed in the following sections

NEED FOR BETTER CONTROLS OVER FUEL RECEIPTS AND ISSUES

Our review revealed cases where (1) fuel receipts and issues were not recorded, (2) recorded issues were not properly

documented, and (3) receipts and issues were not always corrected to 60 degrees Fahrenheit as required by regulations. As a result of these deficiencies commanders are not always aware of the extent of fuel gains and losses and cannot be assured that fuel is being properly used

Fuel receipts and issues not recorded

Army regulations state that bulk fuel accounting procedures apply to periods of time when the units are engaged in field operations or field training exercises However, fuel receipts and issues, amounting to over 97,000 gallons at four of the units visited which were engaged in these activities, had not been recorded

The 1st Armored Division Materiel Management Center did not post receipts of 64,650 gallons of fuel According to the Division petroleum noncommissioned officer-in-charge, the fuel was received during a field exercise and issued to other divisional units However, he did not receive any issue documents and, in order to avoid showing a loss, did not record the receipts.

Three tactical battalions--2/81st Armor, 1/46th Infantry, and 1/509th Infantry--did not record 23 fuel receipts totalling 32,395 gallons during the period October 1978 through February 1979 as required by regulations Most of these omissions occurred during periods when the units were in the field For example, the 2nd Battalion, 81st Armor did not record a November 1978 receipt of 7,850 gallons of diesel fuel The Battalion monthly physical inventory for February 1979 showed a shortage of only 39 gallons Actually, the inventory should have shown a loss of 7,889 gallons if the receipt for the 7,850 gallons had been recorded The Battalion would have had to initiate a Report of Survey to investigate the reasons for a loss of this magnitude

In another case the 1st Battalion, 509th (ABN) Infantry ABCT was not recording receipts and issues of fuel in its property book. From August 9, 1978, to February 1, 1979, the Battalion also had not performed physical inventories and had not documented the disposition of 1,727 gallons of fuel During our visit the Battalion Commander prepared a statement certifying that part of this fuel was consumed by military equipment during a field training exercise.

ENCLOSURE I

Lack of documentation for recorded issues

Recorded issues not supported by documents and mathematical errors at two battalions resulted in overstatements of fuel issues and a corresponding understatement of the book balances as shown below

	Monthly issues posted to property book	Issues supported by documentation	Book balance understatement
1st Btn, 46th Infantry (Nov. 78)			
Motor gasoline	7,416	4,635	2,781
Diesel fuel	43,892	30,870	13,022
2nd Btn, 81st Armor (Feb 79)			
Motor gasoline	19,526	12,230	7,296
Diesel fuel	46,887	40,969	5,918

In November 1978, the 1st Battalion, 46th Infantry performed a physical inventory and reported losses of 99 gallons motor gasoline and 308 gallons diesel fuel For February 1979, the 2nd Battalion, 81st Armor's physical inventory showed a gain of 5,868 gallons of motor gasoline and 244 gallons of diesel fuel However, as shown in the following table, these activities actually incurred losses in excess of those allowable and, according to Army regulations, should have initiated investigations to determine the reasons for those losses

ENCLOSURE I

Activity	Fuel	Recorded Balance	Understatement	Adjusted Balance	Physical Inventory	Gain/ (loss)	Allowable (loss)
1st Btn, 46th Infantry	Motor gasoline	2,694	2,781	5,475	2,595	(2,880)	(101)
	Diesel fuel	18,308	13,022	31,330	18,000	(13,330)	(311)
2nd Btn, 81st Armor	Motor gasoline	2,684	7,296	9,980	8,552	(1,428)	(228)
	Diesel fuel	12,310	5,918	18,228	12,554	(5,674)	(244)

Based on the above, it appeared the monthly issues were arbitrarily increased to make the ending book inventory more nearly agree with the monthly physical inventory We discussed this with battalion officials who claimed this was the acceptable practice

We attempted to verify fuel issued to vehicles by tracing the quantities recorded on the daily issue sheets to those shown in vehicle log books and monthly maintenance activity reports We could only verify a portion of the total issues, because the log books either did not show all fuel receipts or were maintained for only a short period

In contrast, at Camp Darby's Transportation Motor Pool complete information was maintained on the quantity of fuel issued to and the mileage driven by each vehicle on a monthly basis. Using this information over a period of time, Motor Pool officials developed average miles per gallon data for each type vehicle This permitted them to identify potential fuel diversion, as indicated by excessive gallons of fuel for the miles driven, as well as failure on the part of vehicle operators to record fuel received, as indicated by an excessive miles per gallon

Failure to volume correct for temperature

Army regulations require that activities receiving and dispensing bulk fuel in quantities of 3,500 gallons or more make a volume correction to 60 degrees Fahrenheit This is

needed because the volume increases or decreases in direct proportion to temperature increases and decreases

To illustrate For each receipt or issue of 5,000 gallons of motor gasoline at 50 degrees Fahrenheit, a volume correction of about +31 gallons is required in order to avoid understating the quantity received or issued On the other hand, at 70 degrees Fahrenheit, the volume correction would be -31 gallons to avoid overstating the quantity Thus, failure to make the appropriate volume correction results in an erroneous recorded balance of fuel on-hand

Two supply points, Mannheim and Leghorn Army Depot, were not volume correcting fuel issues In addition Mannheim and customers of these activities were not volume correcting their receipts Thus, the book balances of fuel on-hand at these activities were in error and any final accounting for the fuel incorrect Since these activities had not taken temperature readings and properly recorded the receipts and issues, we could not determine the extent of the error We explained the need for volume correction to officials at these activities

NEED FOR IMPROVED PHYSICAL INVENTORIES

Fuel losses and gains were not being accurately determined and reported to command officials for management action because activities were either not taking physical inventories or were not taking them properly The inadequate inventory procedures included not

--performing physical inventories,

--making appropriate volume corrections,

--determining the amount of water in the fuel,

--using accurate line-fill data as part of the inventory,

--using adequate measuring equipment, and

--having current certified tank storage capacity charts

Failure to perform inventories

The Transportation Motor Pool #6 at Kaiserslautern did not physically inventory fuel tanks located at some of its sub-locations The 1st Battalion, 509th (ABN) Infantry ABCT in Vicenza did not perform any monthly physical inventories Also, the supply point at Hanau did not gauge all of its tanks and therefore it was not performing proper physical inventories

At Kaiserslautern, the Motor Pool property book included fuel stored in its main tanks, a tank at a sub-motor pool, and at three other locations within a 50-mile radius However, only the main tanks and the tank at the sub-motor pool were physically inventoried on a monthly basis

We inventoried the fuel tanks at two of the three other locations and found the fuel on-hand at one of these locations was in agreement with the balance shown on the property book. At the other location the amount of motor gasoline on-hand was 565 gallons less than that shown on the property book. The Motor Pool attendant said that he had not inventoried the fuel at the latter location since early 1977 Furthermore, although the other locations submit weekly reports showing daily opening and closing inventories as well as issues, the accountable officer had never inventoried the fuel at the three locations and was not aware that fuel at two of the fuel tanks at these locations was included on his property book He told us that the fuel tanks at these locations would be inventoried at least every 2 months

The 1st Battalion, 509th (ABN) Infantry ABCT stores bulk fuel in a 1,200 gallon tanker and a 500 gallon collapsible drum for use during field training The Battalion was not maintaining an up-to-date property book and was not performing monthly inventories Since the Battalion did not record fuel receipts and issues we did not perform a physical inventory because there was no record of what the on-hand fuel balance should have been to compare to a physical inventory

At the Hanau supply point, we found that end-of-month physical inventories were not performed properly For example, according to December records of daily gaugings, the fuel depth and temperature in two tanks remained exactly the same for the last 25 days of the month On the day the supply

point performed its end-of-month physical inventory, the recorded temperature was 12 degrees Fahrenheit lower while the fuel depth remained the same With such a drop in temperature, the fuel would have contracted, which should have resulted in a lower fuel depth reading. Therefore, we concluded that the tank had not been gauged for the inventory Our physical inventory of all tanks, 6 days later, revealed a shortage of over 23,500 gallons of fuel--14,600 gallons of motor gasoline and 8,900 gallons of diesel fuel--which had not been detected previously due to improper inventory procedures.

Officials told us that previous gaugings on which the inventories were based had been performed by whomever was available, i e , gate guards, drivers, etc They agreed with our observations and directed that effective immediately all gaugings for the end-of-month inventory would be done by a responsible official

Failure to volume correct for temperature

As with receipts and issues of 3,500 gallons or over, activities with storage capacity of 3,500 gallons or more per tank are required to volume correct for temperature at the time of a physical inventory Failure to do so can distort the actual volume of fuel on-hand and makes any reported gains or losses unreliable

Of the 15 activities reviewed, 12 had fuel storage capacity of 3,500 gallons or more per tank and 5 were not making temperature correction of volumes reported in monthly inventories The reasons cited for not making the required adjustments were that usable thermometers were not available, personnel were unfamiliar with the procedure or unaware of the requirement, and the thermometer would not fit into the gauging pipe.

We did not make volume corrections for temperature during our physical inventories at these activities due to the lack of usable thermometers We explained the procedures where necessary and most personnel indicated that they would take corrective action

Failure to measure water volume in storage tanks

Army regulations require that water in the fuel storage tank be measured and deducted from the measured volume of the petroleum product We found that 9 of the 15 activities reviewed did not follow this procedure The following table shows three of the nine activities that had the largest amount of water in their storage tanks which was not being deducted from the measured volume of fuel

Activity	Amount of water measured during GAO inventory (gallons)
Mannheim Supply Point	2,072
Hanau Supply Point	1,262
Vicenza Military Community Activity	427
Total	3,761

As shown above, the amount of water being considered as fuel was greatest at the two supply points At Mannheim, the "disinterested officer" who verified the activity's previous monthly inventory told us that he was unaware of the requirement to check for water in the tanks Responsible officials stated that they would take necessary steps to insure that water in the tanks is measured in future inventories

At the Hanau supply point officials told us that they were not aware that water in the tanks was not being measured They said that in the future physical inventories will be conducted by a responsible official who is aware of the requirement to check for water

At the other activities where we discussed the procedures for measuring water in the tanks, the main reasons given for not following the requirement were (1) not being familiar with the requirement or the procedures to identify water in the fuel and (2) not having water-finding paste

Use of inaccurate line-fill volume

Line-fill is the volume of fuel that is in the pipelines between the tanks and the pumphouse, the pumphouse and the loading and off-loading points, and any other lines through which fuel is moved This volume must be added to the physical inventory each month to determine the total amount of fuel on-hand

At two of the supply points, we found that the line-fill volume included in the inventories was incorrect At Mannheim the total line-fill being carried on the books for all three fuels was 29,687 gallons Based on our observations and a check of the worksheet used to derive this figure, we concluded that line-fill was significantly overstated

At our suggestion the accountable officer made a new calculation based on engineering drawings of the tank farm facilities His analysis resulted in a new line-fill figure of 11,409 gallons--a reduction of over 18,000 gallons This reduction was included in the December 1978 inventory report The reduction offset, in part, the 24,000 gallon gain reported in September 1978, when the activity first began including the line-fill volume as fuel on-hand

At Kaiserslautern we could not determine the correct amount of line-fill volume due to the lack of current engineering drawings However, we were able to estimate that the diesel line-fill volume of 2,000 gallons was probably understated by about 4,000 gallons, and that the gasoline line-fill volume of 12,000 gallons was probably overstated by about 5,000 gallons

Correcting the line-fill volume is a one-time inventory adjustment of the fuel on-hand and since new lines are to be installed at Kaiserslautern in the summer of 1979, we did not suggest that the line-fill volume be corrected An official stated that an accurate volume can be determined from engineering drawings for the new lines

Inadequate inventory equipment and uncertified storage capacity charts

Nine of the 15 activities reviewed did not have the proper equipment or supplies for conducting physical inventories. The lack of proper equipment included broken measuring tapes,

broken or missing gauging sticks, and broken or missing thermometers Without such equipment the ability of personnel to accurately inventory fuel is very improbable and any reported fuel gains or losses are questionable

Furthermore, at eight of the activities, we could not accurately establish the storage capacity because charts showing the capacity had not been certified For example, at the Mannheim supply point we were told that for two tanks we should add 4 inches to the measured depth reading of the fuel Officials could not explain the basis for this "add-on" procedure One of the officials said this information had just been passed along by word of mouth For these tanks, 4 inches amounts to about 4,500 gallons, thus, for the two tanks, a total of about 9,000 gallons of fuel is in question This illustrates the type of problems encountered when capacity charts are not certified

According to some officials, responsibility for certifying the capacity charts rests with the facility engineers However, these officials expressed the opinion that support from facility engineers was not adequate

ENCLOSURE II

REPORTS ON PETROLEUM MANAGEMENT

Letter report to the Secretary of Defense on the review of military services' accountability and management controls over fuel in Korea and the Philippines, LCD-79-210, B-163928.

"Continuing Need To Establish Uniform Guidelines for Controlling and Accounting for Ground Vehicle Fuels," LCD-77-220, July 20, 1977

"Lessons in Management Problems in Petroleum Procurement and Distribution in Southeast Asia," LCD-76-215, March 15, 1976.

"Improvements Needed in Controls and Accounting for Ground Vehicle Petroleum," LCD-75-218, May 20, 1975

"Bulk Fuels Need to be Better Managed," LCD-74-444, April 8, 1975.

"Investigation of the Handling and Control of Petroleum Products in Southeast Asia," B-163928, July 28, 1970.

"Investigation in Thailand of the Systems for Distributing Petroleum, Oil, and Lubricants and for Processing Related Documentation," B-163928, January 9, 1969