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REPORT BY THE U.S.

General Accounting Office

Material Handling Equipment--A Weak Link In The Defense Logistics Chain

Bob

The material handling capability of Army and Air Force units overseas is seriously impaired because of material handling equipment problems.

Much equipment on hand is overaged and overused resulting in severe maintenance problems. In addition, shortages of needed equipment are hindering material handling operations.

This report discusses the need to upgrade material handling equipment and improve the capability to handle material within the Department of Defense supply system.



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AUGUST 10, 1979



UNITED STATES GENERAL ACCOUNTING OFFICE

WASHINGTON, D.C. 20548

LOGISTICS AND COMMUNICATIONS
DIVISION

B-146896

The Honorable Harold Brown
The Secretary of Defense *AGC00005*

Dear Mr. Secretary:

This report addresses problems concerning the availability and readiness of material handling equipment to move Defense cargo at overseas locations. It discusses the services' reliance on overaged and overused material handling equipment, the equipment's frequent unavailability due to the excessive maintenance required, delays in receiving repair parts, and shortages of needed material handling equipment.

Chapter 3 contains our recommendations to you. As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report, and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

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

Sincerely yours,

A handwritten signature in cursive script that reads "R. W. Gutmann".

R. W. Gutmann
Director

D I G E S T

Although material handling equipment is vital to moving cargo efficiently, it has apparently remained low on the Department of Defense's list of priorities when competing for resources. This is evidenced by the fact that the material handling equipment fleet has not kept pace with the shift from break-bulk to containerized shipping practices, and problems identified years ago still have not been resolved.

The material handling capability of the U.S. Armed Forces overseas is seriously impaired. GAO found that:

- HC* - Much of the material handling equipment used overseas is old and will soon exceed its life expectancy, if it has not already. (See pp. 4 and 5.)
- Maintenance of material handling equipment was adversely affected because of its age and lengthy delays in obtaining repair parts. (See pp. 4 and 5.)
- There were shortages of material handling equipment needed to efficiently handle and process cargo shipments. (See pp. 6 to 9.)

In terms of efficiency, material handling equipment used overseas is marginally adequate for peacetime operations. More importantly, problems with material handling equipment could result in units being unable to meet surge requirements of a wartime contingency. (See p. 10.)

To improve the material handling capability of logistics operations in the Republic of Korea and Germany, the Secretary of Defense should establish a realistic and timely schedule for

--replacing the overaged and hard to maintain equipment;

--acquiring new and specialized items, including support equipment, needed to efficiently handle containers and containerized cargo; and

--adding needed items to claimant stocks and war reserves. (See p. 11.)

X The Secretary should also make sure that material handling equipment needs get the priority they deserve in competing for funds so that this schedule can be carried out.

X In addition, the Secretary should direct the services to survey their material handling operations to make sure that

--equipment operators properly maintain their equipment,

--docking facilities are capable of receiving containerized shipments of supplies,

--containers are loaded so that they can be easily emptied, and

--parts needed to repair equipment are provided in a more timely manner. (See pp. 11 and 12.)

The Army and Air Force agreed with GAO's findings and recommendations. They pointed out that some corrective actions have already been taken and others are planned. Recent procurements of material handling equipment along with planned acquisitions should alleviate many of the problems highlighted by GAO. (See pp. 12 and 13.)

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ABBREVIATIONS

DOD	Department of Defense
GAO	General Accounting Office
MHE	material handling equipment
USAREUR	U.S. Army, Europe

CHAPTER 1

INTRODUCTION

THE ROLE OF MATERIAL HANDLING EQUIPMENT

The importance of material handling equipment (MHE) in moving cargo promptly and efficiently within the Department of Defense's (DOD's) logistics system cannot be overemphasized. Included in this family of equipment are

- cranes used to lift and move heavily loaded containers from containerships;
- heavy forklifts for handling containers at ports, inland marshalling areas, and transfer points; and
- small forklifts and specialized equipment used to load and remove cargo from containers and to facilitate storage operations at theater supply and user units.

Although MHE is vital to moving cargo efficiently, it has apparently remained low on DOD's list of priorities when competing for resources. This is evidenced by the fact that the MHE fleet has not kept pace with the shift from break-bulk to containerized shipping practices, and problems identified years ago still have not been resolved.

SHIFT FROM BREAK-BULK TO CONTAINERS

Over the past decade, the shift by the merchant marine industry from a break-bulk fleet to containerships has compelled DOD to reexamine its programs to support deployed forces and projected contingencies. Future contingencies will require heavy reliance on the use of containers for the overseas shipment of commodities.

Before the Vietnam conflict, most supplies were shipped overseas as break-bulk cargo. During the Vietnam era, the increased use of containers resulted in significant savings in cost, time, and personnel because it reduced cargo handling and the loss, damage, and pilferage of supplies. In recent years, economic factors have compelled the civilian maritime industry to convert ships from a break-bulk fleet to a container fleet. From 1970 to 1978 DOD containerized shipments increased from 25 percent to an estimated 75 percent of all DOD's general cargo moved.

Since the military services must rely on the civilian maritime industry to transport cargo overseas, it is imperative that their logistical systems be compatible with container operations of the commercial fleet and with DOD's concept of increased use of containers for shipping. Supply and transportation units must be provided the specialized equipment and personnel needed for moving and handling all types and sizes of commercial and military containers as well as break-bulk cargo. Much of the MHE used to handle break-bulk cargo is unsuited for container operations, and equipment used commercially is not designed to operate in the demanding environments (unsurfaced areas and rough terrain) of military operations.

PAST PROBLEMS HAVE NOT BEEN RESOLVED

The Army, in 1970, recognized the need for specialized forklifts to load and unload containers. In October 1971 the Army's Field Materials Handling Equipment Family study recommended a low mast, 2,500-pound capacity, rough terrain forklift to move cargo in and out of containers since most pallet loads would not exceed 2,500 pounds. In July 1973 the Department of the Army approved developing this forklift citing that the current methods of loading and unloading containers (forklifts without rough terrain capability, manual loading and unloading, or winching methods) were inefficient and caused operational delays and damage to cargo and containers.

In December 1974 the Army revised the requirements for rough terrain forklifts from a 2,500-pound capacity to a 4,000-pound model, which could handle both regular cargo and heavy ammunition pallet loads. This change in forklift capacity requirements was a primary reason for the delay in providing necessary forklifts to Army users.

In early 1976 an official of the Army's Tank Automotive Command stated that the 4,000-pound rough terrain forklift would not be available until about the third quarter of fiscal year 1979. In the interim, substitute items were sent to the Army in the field.

The Army in the Field Container System Study, dated September 1974, developed a container distribution system to support the Army in the field. The study provided guidance for revising or modifying current doctrine and organizations and for acquiring needed equipment. Based on the study's findings and conclusions, it was recommended, among other things, that

--tables of organization and equipment for transportation and supply units be revised to provide required personnel and equipment for container handling and transport operations, and

--needed container handling and transport equipment for transportation and supply units be developed, tested, and procured.

However, at the time of our review, most of the tables of organization and equipment affected by containerization had not been changed because most of the necessary equipment had not been "type classified." This is a process equipment must go through before being authorized for issuance. Most of the needed equipment identified by the study was still being tested.

Delays in providing needed MHE to Army users were also discussed in a June 13, 1975, message to Headquarters, Army Materiel Command, from the Commander-in-Chief of the U.S. Army, Europe (USAREUR). This message described the critical nature of the container unloading situation. The Commander-in-Chief emphasized the Army's reliance on containers, the need for rough terrain forklifts, the inadequacies and maintenance problems of existing equipment, and the Army Materiel Command's unresponsiveness to the needs of Army field units.

SCOPE OF REVIEW

We assessed the capability of selected Army and Air Force field units in Germany and Korea to handle peacetime and surge volumes of cargo. We obtained documentation and discussed the adequacy and readiness of MHE assigned to the units and reviewed maintenance problems associated with the equipment. In addition, we observed the use of MHE in daily operations. A listing of the specific locations we visited is included in appendix I. The following chapters of this report address MHE problems found at overseas depots, forward supply units, and user units.

CHAPTER 2

ACTION NEEDED TO UPGRADE MHE AND IMPROVE

HANDLING OF DOD CARGO AT OVERSEAS LOCATIONS

We found that Army and Air Force units overseas were handicapped in carrying out their material handling functions. Two of the more serious conditions contributing to this problem are that (1) units are using overaged and worn out MHE which is difficult to repair and maintain and (2) units have shortages of general and specialized types of MHE needed to efficiently perform their daily missions. Adding to these problems are inadequate maintenance by equipment operators, deficiencies in the way containers are loaded, inadequate docking facilities, and shortages of war reserve and prepositioned MHE items.

AGE OF EQUIPMENT AND DELAYS IN RECEIVING REPAIR PARTS ARE PRINCIPAL MAINTENANCE PROBLEMS

We found that much of the MHE used overseas was close to or had exceeded its life expectancy. We were told that many MHE items in Korea are retrogrades shipped there after the drawdown of U.S. Forces in Vietnam and Okinawa. This older equipment requires additional maintenance to keep it operable and is frequently unserviceable for extended periods because of delays in receiving replacement parts. For some models manufacturers have stopped producing repair parts. Specific examples of these conditions, observed in Korea and Germany, are discussed below.

At the time of our visit, 10 of 15 MHE items assigned to an Air Force supply squadron supporting units at Osan Air Base, Korea, were at least 8 years old and 7 of these 10 were at least 10 years old. Two of the older forklifts had lost most of their lifting power. Supply squadron personnel stated that at least three forklifts are down for repair at any given time. Also, they have waited up to 2 months to repair equipment because parts were not available. Much of the equipment is old and manufacturers have stopped producing repair parts for some models.

Delays in receiving repair parts were also noted at an Army ammunition depot in Korea. We found that a 20-ton crane used at the depot was inoperable and had been awaiting a repair part for 4 months. Similarly, only a few months before our visit, an Army supply and transportation battalion's only crane had been inoperable for about a year awaiting a needed repair part.

Deadlined equipment at an Army maintenance battalion assigned to the 2d Infantry Division, Camp Casey, Korea, was limiting the unit's ability to receive and ship cargo and move repair parts within the work area. For example, five of the unit's seven forklifts were inoperable. The loss of this equipment was hindering the unit's warehouse operations. Three of the deadlined items were 2,000-pound forklifts needed to move cargo in the narrow aisles within the warehouse. The only other means of moving material in or out of the warehouse was by slower manual methods which could endanger personnel and damage stored supplies.

Information obtained from the 24th Supply and Service Company in Europe indicated that it received 80 percent of its peacetime supplies in containers. The company had no operable forklifts capable of entering and emptying the containers. The unit's only forklift--a 2,000 pound low-mast commercial forklift--capable of performing this task had been awaiting a starter for 6 months. Officials of the 2d Support Command, VII Corps, Germany, told us that on the average it takes 3 to 6 months to receive necessary repair parts for MHE items. We were later advised by personnel at the Army's Material Management Center that this is the average time delay experienced by USAREUR in receiving repair parts for MHE.

In USAREUR's V Corps we visited a break-bulk point facility at Offenbach, Germany. This facility received cargo in containers, railcars, and commercial trucks. Its six forklifts were from 3 to 8 years old. Officials said that the age of their equipment contributes to maintenance problems and that there are occasions when half of their forklifts are deadlined for repair. They also indicated that they have been encountering delays in getting repair parts.

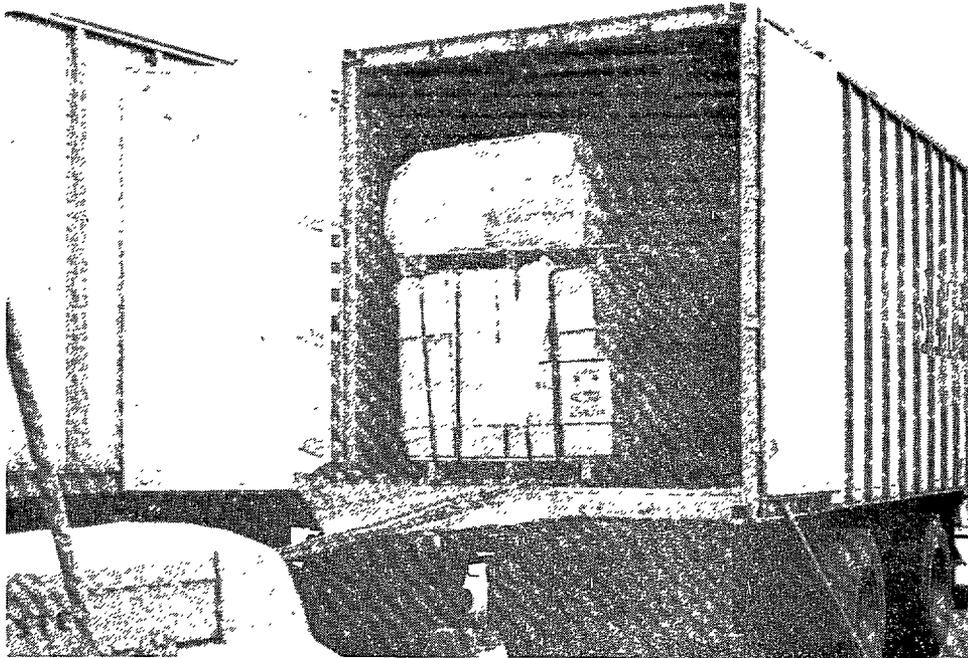
At Miesau Army Depot, Germany, forklifts were from 2 to 16 years old. Maintenance personnel said the age of the MHE is a major reason contributing to difficulties in keeping the forklifts operable. They pointed out that in many cases the needed repair parts were not stocked in theater and that they had waited as long as 1 year to receive needed parts. For some older equipment, parts simply were not available. Such was the case for a clutch needed to repair one of the forklifts. Maintenance officials said they were going to try to rebuild the clutch from available parts.

Maintenance personnel at another supply and service company in Europe stated that approximately 40 percent of their forklifts are deadlined at any given time. A major problem cited was delays in getting repair parts because of the equipment's age. It took as long as 1-1/2 years to receive some items.

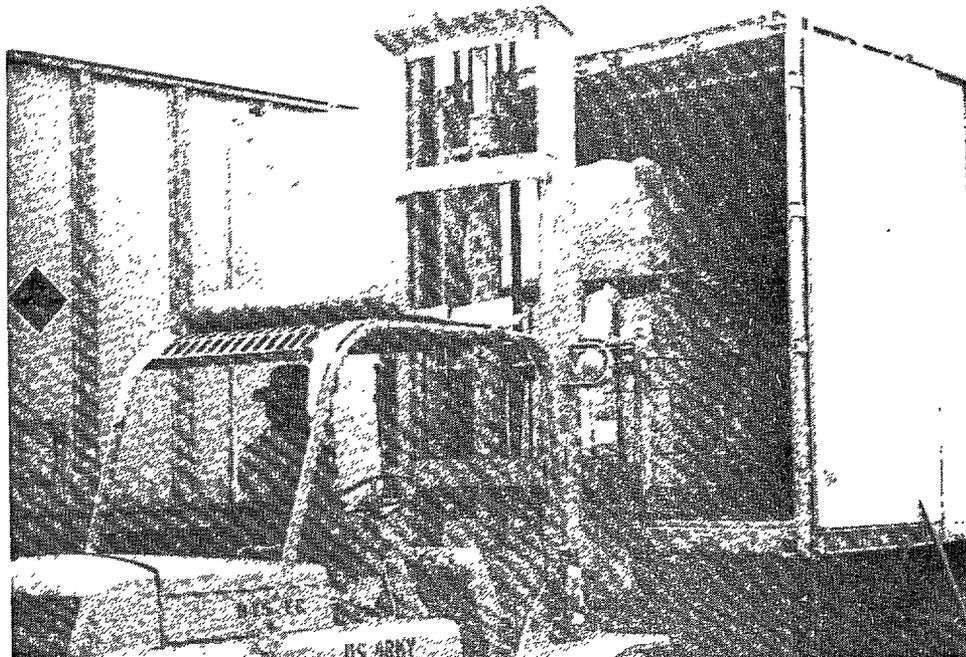
SHORTAGES OF NEEDED MHE AFFECT
HANDLING CAPABILITY

Several Army and Air Force units we visited did not have all the MHE authorized to handle their peacetime workloads and lacked special types of MHE needed to efficiently handle cargo received in containers. For example, one direct support supply and service activity in Korea was authorized 36 MHE items but had only 29 onhand. According to unit officials, even the types of equipment authorized were inadequate because they did not include low-mast forklifts or electric pallet jacks, which are needed to efficiently unload containers.

Operations observed at the 305th Supply and Service Company, Supply Point 51, Seoul, Korea, illustrated the need for low-mast forklifts to remove cargo from containers. We watched as personnel used a 10,000-pound capacity rough terrain forklift with an attached cable to pull cargo pallets to the rear of the container. The cable was then detached from the pallet and the forklift carried the pallet to the warehouse dock. From there, a 4,000-pound capacity forklift moved the pallet into the warehouse. On several occasions during this operation the cable broke loose from the pallets and had to be reattached, damaging the pallets. Several times cargo fell off the pallets onto the pavement. The operation not only damaged cargo but was time consuming and subjected personnel to possible injury. Unit officials stated that unloading containers in this way was necessary because their forklifts have high masts which preclude them from entering and removing pallets from the containers. We observed this same type of operation at other locations in Germany and Korea. Photographs of one of these operations is shown on page 7.



A PALLET, WHICH WAS PLACED IN THE WRONG DIRECTION FOR LOADING, IS BEING PULLED TO THE END OF A CONTAINER BY A 15,000-POUND COMMERCIAL FORKLIFT. ASSISTANCE WAS REQUIRED FROM THE MAN INSIDE TO KEEP THE CARGO STEADY WHILE DRAGGING IT TO THE END OF THE CONTAINER.



A 15,000-POUND FORKLIFT REMOVING THE PALLET FROM THE CONTAINER FOR TRANSFER TO THE WAREHOUSE.

When we compared onhand MHE items against peacetime authorizations, many disparities appeared. The most significant disparities for Army units in Germany are shown below.

<u>Item description</u>	<u>Organization</u>	<u>Peacetime authorization</u>	<u>Onhand</u>
6,000-pound rough terrain forklift	V Corps	98	81
	VII Corps	80	76
	21st Support Command	70	63
10,000-pound rough terrain forklift	V Corps	41	34
	21st Support Command	42	38
4,000-pound electric forklift	V Corps	39	24
	VII Corps	21	15
	21st Support Command	243	184
	a/Other	15	7
6,000-pound gas forklift	21st Support Command	144	129
4,000-pound gas warehouse tractor	21st Support Command	122	114

a/Includes units such as the Southern Task Force and Berlin Brigade.

At the time of our review, USAREUR had no forklifts capable of unloading containers in a rough terrain environment. All MHE authorized and onhand capable of efficiently unloading containers was of commercial design, which required a hard stand or reinforced surface. It is unlikely that hard stand areas would always be available in contingency and war environments. Consequently, commercial MHE may have limited application for unloading containers during wartime.

For the U.S. Air Force in Germany, including the Military Airlift Command, some of the equipment shortages were as follows:

<u>Equipment type</u>	<u>Peacetime authorization</u>	<u>Onhand</u>
4,000-pound electric/gas forklift	97	84
10,000-pound rough terrain forklift	26	17
10,000-pound forklift	55	44

OTHER FACTORS CONTRIBUTING TO MATERIAL HANDLING PROBLEMS

In addition to the problems discussed above, there are other factors contributing to the material handling problems. We found that operators were not performing maintenance on their equipment, poor container loading practices were hindering unloading efforts, and there were inadequate docking facilities.

Lack of operator maintenance

At two units visited in Korea, the condition of the MHE was aggravated by a lack of proper operator maintenance. One unit commander said that very few personnel are trained in forklift maintenance, and the inability of operators to properly maintain MHE daily is disadvantageous to a good maintenance program.

At another unit in Korea, MHE maintenance problems resulted partly because personnel are assigned for only 1 year and replacement personnel are not always familiar with the types of MHE assigned to the units. The unit commander stated he may not realize an operator cannot properly maintain the equipment until it has been deadlined for repairs.

Container loading practices hamper MHE operations

Personnel from several units in Korea and Germany complained about the way some containers are loaded at U.S. supply depots. Complaints included the sideways placement of cargo pallets inside the containers, the height to which pallets are stacked, unpalletized cargo, and broken pallets.

Usually, manual effort is required to unload the cargo when these problems occur. (See photograph on p. 7.) Officials at one unit in Europe estimate that 10 percent of the containerized cargo received has one or more of these problems.

Inadequate docking facilities

DOD's increased use of containerized shipments has created a need for compatible docking facilities to be used in unloading containers. Several units we visited lacked adequate docking facilities.

For example, an Air Force supply squadron in Korea received about 90 percent of its cargo in containers. Because of the difference in height between the squadron's warehouse docking facility and the floor of the containers, a forklift could not be used to enter and unload the containers. This increased the time and personnel needed to unload the containers. At other locations in Korea and Germany, docking facilities simply did not exist.

PROBLEMS MAY AFFECT ABILITY TO RESPOND TO CONTINGENCY REQUIREMENTS

Although the support activities we visited were able to work around current MHE problems and handle peacetime workloads, additional shortfalls in claimant stocks, theater war reserves, and POMCUS 1/ assets could cause serious choke points and delay the movement of materials during crisis operations.

Many of the activities we visited were authorized levels of personnel and equipment which were less than their wartime authorization. The additional equipment needed to bring a unit up to its wartime authorization is called claimant or decrement stocks. Theater war reserves are supplies prepositioned to be used as the initial resupply support for forces engaged in combat. Shortages of these reserve assets were found in both Korea and Germany.

1/Prepositioning of materiel configured to unit sets (POMCUS) represents stocks overseas for stateside units which will deploy in a contingency.

CHAPTER 3

CONCLUSIONS, RECOMMENDATIONS, AND AGENCY

COMMENTS AND OUR EVALUATION

CONCLUSIONS

The material handling capability of Army and Air Force units overseas is seriously impaired because of material handling equipment problems. Much of the equipment onhand is overaged and overused resulting in severe maintenance problems. In addition, shortages of needed equipment are hindering material handling operations. We believe many of these problems can be attributed to the apparent low priority given to improving the status of MHE over the past several years.

Although Army and Air Force units are working around these problems and getting the job done during peacetime, the equipment is used inappropriately, personnel are subject to injury, and cargo is subject to damage. Furthermore, shortages of reserve assets may cause serious problems during contingency situations when a heavy surge of materials is expected to flow into the system.

RECOMMENDATIONS

To improve the material handling capability of logistics operations in the Republic of Korea and Germany, the Secretary of Defense should establish a realistic and timely schedule for

- replacing the overaged and hard to maintain equipment;
- acquiring new and specialized items, including support equipment, needed to efficiently handle containers and containerized cargo; and
- adding needed items to claimant stocks, POMCUS, and war reserves.

The Secretary should also make sure that material handling equipment needs get the priority they deserve in competing for funds so that this schedule can be carried out.

We also recommend that you direct the services to survey their material handling operations to make sure that

- equipment operators properly maintain their equipment,

- docking facilities are capable of receiving containerized shipments of supplies,
- containers are loaded so that they can be easily emptied, and
- parts needed to repair equipment are provided in a more timely manner.

AGENCY COMMENTS AND OUR EVALUATION

We discussed the results of our work with officials of the U.S. European Command; U. S. Army, Europe; V Corps, VII Corps, and the 21st Support Command in Germany; and Headquarters, United States Forces, Korea. None of these officials took exception to the information presented.

We also met with representatives of the Office of Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics) as well as representatives from Army and Air Force Headquarters to obtain their views on our findings and recommendations.

Although no one took exception to our findings, both Army and Air Force representatives were quick to point out that actions have been taken, or are planned, to correct many of the MHE problems highlighted in our report. Information provided to us showed recent and planned procurements of MHE-related items. Although no details were provided showing actual or planned distribution of this equipment, we were told that the European theatre has first priority.

Regarding our recommendation that MHE needs receive a higher funding priority, Army and Air Force officials representatives stated that current budget plans are giving MHE one of the highest priorities it has received in several years. Air Force representatives stated that they have a 5-year/\$240 million program planned for MHE procurement. They stated further, however, that procurements to increase war reserve assets in Europe are being postponed pending negotiations with foreign countries for host nation support. They stated that Pacific theatre war reserve stocks are now at authorized levels.

Concerning solutions to the MHE repair parts problem, Air Force representatives said they were planning to purchase some MHE from the country where it would be used; i.e., German-made forklifts for use in Germany. They said this would help eliminate the long supply pipeline from the continental United States. The Army representative said that the Army was also

planning to explore the procurement of foreign-made MHE items. In addition, an effort is underway to stock more repair parts in theatre for American-made equipment.

We believe that if funded and implemented, the planned improvements outlined by headquarters officials, along with actions already taken, will alleviate many of the problems discussed in this report. Because MHE is vital to the movement of DOD materials in peace and wartime, we believe that management officials should continue to place a strong emphasis on MHE enhancement in future budget programs.

LOCATIONS VISITED DURING GAO REVIEW OF
MATERIAL HANDLING EQUIPMENT

GERMANY

Headquarters, United States European Command,
Waihingen, Germany.

Headquarters, United States Army, Europe,
Heidelberg, Germany.

Headquarters, United States Army V Corps,
Frankfurt, Germany.

3d Support Command, V Corps, Frankfurt, Germany.

Break-bulk Point, United States Army Military
Community-Frankfurt, Offenbach, Germany.

Headquarters, United States Army VII Corps,
Stuttgart, Germany.

2d Support Command, VII Corps, Stuttgart, Germany.

United States Army 21st Support Command,
Kaiserslautern, Germany.

60th Ordnance Group, 21st Support Command,
Zweibruecken, Germany.

Miesau Army Depot, 60th Ordnance Group, 21st Support
Command, Kaiserslautern, Germany.

Kaiserslautern Army Depot, 21st Support Command,
Kaiserslautern, Germany.

66th Maintenance Battalion and Subordinate Units,
21st Support Command, Kaiserslautern, Germany.

USAREUR Material Management Center, Zweibruecken,
Germany.

Petroleum Management Center, Zweibruecken, Germany.

4th Transportation Brigade, Oberursal, Germany.

Headquarters, United States Air Force, Europe,
Ramstein, Germany.

Headquarters, 86th Tactical Fighter Wing,
Ramstein, Germany.

Military Airlift Center, Europe, Ramstein, Germany.

KOREA

Headquarters, United Nations Command/United States
Forces, Korea/Eighth United States Army,
Seoul, Korea.

2d Transportation Group, Pusan, Korea.

69th Transportation Battalion, Camp Eiler, Korea.

United States Army Port, Pusan, Korea.

19th Support Command, Seoul, Korea.

227th Maintenance Battalion, Niblo Barracks, Korea.

305th Supply and Service Company, Supply Point 51,
Seoul, Korea.

61st Maintenance Company, Camp Kyle, Korea.

United States Army Materiel Support Center - Korea,
Camp Carroll, Korea.

Supply Point 48, Pusan, Korea.

Masan Ammunition Depot, Korea.

2d Infantry Division, Camp Casey, Korea.

2d Supply and Transportation Battalion,
Camp Casey, Korea.

314th Air Division, Osan, Korea.

Supply and Transportation Squadrons of the 51st
Air Wing, Osan Air Force Base, Osan, Korea.

611th Military Airlift Support Squadron, Osan
Air Force Base, Osan, Korea.

K-2 Airfield, Taegu, Korea.

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