United States General Accounting Office

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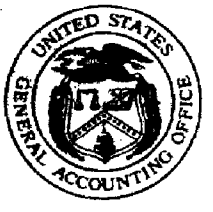
Report to the Chairman, Subcommittee on Readiness, Committee on Armed Services, House of Representatives

TACTICAL AIRLIFT

Observations Concerning European Distribution System Operations



GAO

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

National Security and
International Affairs Division

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June 21, 1989

The Honorable Earl Hutto
Chairman, Subcommittee on Readiness
Committee on Armed Services
House of Representatives

Dear Mr. Chairman:

As requested, we reviewed selected aspects of the Air Force European Distribution System (EDS). In an earlier report[1] we expressed concern about the efficiency and effectiveness of EDS as planned by the Air Force. In this follow-up review, our objective was to determine the status of EDS and its operational effectiveness. We briefed your staff previously on the results of our work.

Background

EDS, which began in March 1985, is an Air Force initiative designed to provide U.S. Air Forces in Europe (USAFE) greater assurance that spare parts will be available to keep tactical aircraft and ground-launched cruise missile systems operational in Europe during wartime. Through rapid movement of spare parts and engines between USAFE and allied bases, from 15 to 300 additional operational tactical aircraft are projected to be available daily in the early stages of a European war. EDS was justified as an efficient way to reduce the length of time aircraft are not fully mission capable due to a lack of spare parts (referred to as MICAP aircraft) in wartime. EDS consists of an automated logistics command, control, and communications (LOG C^3) system; 2 spare parts warehouses, 1 of which is operational; and 18 C-23 aircraft. Total EDS operating costs in fiscal year 1988 were about $29 million.

Results in Brief

We found that the U.S. European Command and the Air Force have taken several actions to make EDS more efficient and effective in peacetime, even though EDS is a wartime system. Some of those actions have had limited results. For example, EDS has had little effect on the delivery of critical parts. In addition, after 3 years of operations the EDS aircraft still were experiencing limited use of their allowable cabin load capacity, and about two-thirds of EDS cargo was non-mission essential. As a result of the low use, the cost per pound for cargo moved on EDS aircraft is

[1]Tactical Airlift: Air Force European Distribution System—Lessons Learned (GAO/NSIAD-87-4, Oct. 15, 1986).

many times more than the cost per pound of other Military Airlift Command service in Europe. We observed that a contributing factor to the low usage of the C-23s is USAFE's inability to date to take greater advantage of opportunities to carry non-Air Force material, even though the Air Force has made an extensive effort to open up EDS service to U.S. Army and Navy users in Europe. For example, Army shipments in fiscal year 1987 represented less than 3 percent of the total shipments aboard EDS aircraft.

We recognize that EDS, as a wartime system, was not designed around a peacetime efficiency objective. However, we believe that the Air Force should strive to make EDS as efficient and effective as practicable. EDS would be more efficient if (1) the use of the C-23 aircraft increased and (2) the amount of routine service to locations where less expensive, alternative service is available was reduced. These improvements to EDS' efficiency would leave the system available for its wartime role. Another alternative suggested by the Senate Committee on Appropriations is to make EDS a reserve mission in peacetime. However, the Air Force and the reserves have concluded that this would not be practical without a major redesign of EDS. The LOG C^3 system, considered by some Air Force officials to be the most important aspect of EDS, continues to experience design problems after 4 years of development and may warrant some redirection.

Some additional observations concerning the measures taken to date to improve EDS operations and others that could further strengthen the program and make it more efficient are discussed in appendixes I through IV.

Agency Comments

The Department of Defense (DOD) reviewed a draft of this report and concurred with most of our findings. DOD's views differed from ours regarding the use of EDS in peacetime and wartime and the need for a specialized system for detailed monitoring of EDS. DOD said that our evaluations focused too much on the peacetime costs and benefits of the system and not enough on what it is expected to achieve in wartime. We recognize that EDS is intended to have its principal benefit during wartime. However, we believe that the operation of EDS in peacetime in a way that will provide the greatest benefits practical, relative to the costs involved, need not detract from its wartime purpose. Appendix V contains DOD's comments. They have been evaluated and incorporated into the report where appropriate to fully reflect DOD's views.

Objective, Scope, and Methodology

To determine the status of EDS, we reviewed pertinent legislation, regulations, cost estimates, studies, and documents concerning EDS operations from 1985 through 1987. We selected a sample of MICAP incidents to determine the impact EDS has had on those incidents and determined the sources of spare parts used to satisfy MICAPs from 1985 through 1987. In addition, we interviewed Air Force, Army, and Navy officials of EDS user units at various bases in Europe.

We did our work at selected offices associated with the EDS program at the DOD Headquarters, Washington, D.C., and Headquarters, Air Force Logistics Command, Wright-Patterson Air Force Base, Ohio, between August 1987 and January 1989. We also did work at Headquarters, USAFE, Ramstein Air Base, Germany; Military Airlift Command organizations at Ramstein and Zweibruecken Air Bases, Germany; and Royal Air Force Kemble air base, United Kingdom, during the period August to December 1987. We conducted our work in accordance with generally accepted government auditing standards.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of the report until 30 days after its issue date. At that time we will send copies to the Secretaries of Defense and the Air Force; the Director, Office of Management and Budget; appropriate congressional committees; and other interested parties.

GAO staff members who made major contributions to this report are listed in appendix VI.

Sincerely yours,

Harry R. Finley

Harry R. Finley
Director, Air Force Issues

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Appendix VI Major Contributors to This Report

Tables

Abbreviations

AFLC	Air Force Logistics Command
DOD	Department of Defense
EDS	European Distribution System
GAO	General Accounting Office
LOG C^3	logistics command, control, and communications
MAC	Military Airlift Command
MICAP	mission capable
RAF	Royal Air Force
USAFE	U.S. Air Forces in Europe
USAREUR	U.S. Army, Europe
USEUCOM	U.S. European Command
USNAVEUR	U.S. Navy, Europe

Introduction

The European Distribution System (EDS) was designed to provide assured wartime distribution of mission-essential spare parts to repair U.S. tactical aircraft and ground-launched cruise missile systems at about 100 U.S. and allied installations throughout the European theater. As of January 1989, EDS consisted of (1) 18 C-23 aircraft to provide dedicated transportation of spare parts, related support equipment, and maintenance personnel between U.S. Air Forces in Europe (USAFE) bases, spare parts forward stockage locations, and several dozen other airfields and bases that USAFE would use in wartime, (2) two forward stockage sites to augment stocks of parts at air bases, and (3) a logistic command, control, and communications (LOG C^3) system to facilitate tactical aircraft spare parts identification and distribution decisions. The Air Force has an option with the manufacturer to purchase additional aircraft. However, the Department of Defense (DOD) advised us in March 1989 that the Air Force had no plans to exercise that option.

On the basis of a 1981 Rand Corporation report,[1] the Air Force projected that an assured spare parts distribution system could generate from 15 to 300 additional operational tactical aircraft during the early stages of a European war. The projection of the number of aircraft is subject to variables including the nature and intensity of the conflict, the number of aircraft that deploy and arrive in Europe on schedule, and the number of aircraft lost in battle.

Status of the Three EDS Elements

EDS began operating with six light-utility C-23 aircraft in March 1985. The 18th aircraft was delivered in December 1985. The aircraft are assigned to the Military Airlift Command's (MAC) 10th Military Airlift Squadron located at Zweibruecken Air Base, Germany.

The first EDS forward stockage site is located at Royal Air Force (RAF) Kemble air base, United Kingdom; the second is at Torrejon Air Base, Spain; and a third is planned at Zweibruecken Air Base. Only the Kemble warehouse is operational; it started operating in January 1985. The Torrejon warehouse has been built, but its operational status was delayed at the time of our review, awaiting resolution of U.S./Spain base rights negotiation relating to the United States' use of Torrejon Air Base. The Zweibruecken site was on hold pending the results of a future threat assessment and further forward stockage operating experience. Since

[1] The Rand Corporation, Combat Benefits of a Responsive Logistics Transportation System for the European Theater, December 1981 (a Project AIR FORCE report).

that time the United States has decided to move its tactical aircraft out of Torrejon Air Base and not to have an EDS warehouse at that location.

In commenting on a draft of this report, DOD stated that the Air Force, in response to a USAFE request to activate an EDS stockage site at Zweibruecken Air Base, is currently reviewing the overall spare parts requirement and the effect of another site on worldwide support to tactical air forces in both peace and war. DOD further observed that USAFE also has requested that steps be taken to identify a third warehouse location in Italy; however, a similar detailed study will be required before pursuing that initiative.

A firm fixed-price contract for a LOG C^3 system was awarded in September 1984. However, the system has experienced software problems in interfacing with other Air Force systems. An operational test and evaluation, completed in November 1987, identified 36 software and interface problems, 25 of which the Air Force considered significant. An Air Force official advised us in January 1989 that 8 of the 25 significant problems, which were within the LOG C^3 contract scope, were resolved to USAFE's satisfaction and the system was retested during the October to December 1988 time frame. The remaining 17 problems caused inconveniences for the system operators but did not prevent the system from performing its mission. Therefore, the Air Force does not plan to address the remaining 17 problems at this time.

The EDS life-cycle cost was initially estimated at $1.3 billion through fiscal year 2002; through fiscal year 1987, the program cost about $148 million. EDS operating costs were about $31 million in 1987 and are estimated to remain at about that level during peacetime. This cost will increase if additional warehouses are placed into operation or if the LOG C^3 is expanded beyond the initial coverage, which represented about 26 percent of the EDS wartime locations.

In its comments on a draft of this report, DOD said that although no current life-cycle cost has been developed for EDS, it now estimates that the EDS life-cycle cost will be far lower than previously estimated, possibly as much as 30 to 45 percent lower. DOD officials said that this projection was based on (1) a comparison between the actual costs over the first 5 years of EDS planning and operations through fiscal year 1987 and an earlier projection for that period, (2) the possibility that the second and third warehouse would not be placed into operation, and (3) the assumption that LOG C^3 plans would be scaled back further by EDS reliance on

enhanced standard base supply operations. DOD stated that continuing aggressive management actions will maintain this reduction trend.

Previous GAO Report on EDS

In our 1986 report, we concluded that EDS might not effectively and efficiently accomplish its intended missions and would cost much more than the amount justified to the Congress because of inadequate analysis and planning in preparation for the program. We also reported that

- the planned cargo loads for EDS aircraft would often be less than the capacities of the aircraft and, consequently, would not meet the Joint Chiefs of Staff or U.S. European Command (USEUCOM) requirements for ensuring the lowest cost airlift possible;
- the Air Force should investigate or solicit the common use of the C-23s by other services and U.S. allies to improve the efficiency of the aircraft;
- three forward stockage sites might create unnecessary EDS warehouse space and the Air Force should not further consider building an EDS warehouse at Zweibruecken until the need for such storage had been demonstrated and existing leased space is considered to meet the needs; and
- the LOG C^3 system capability for locating repair parts had not been fully automated.

DOD commented that EDS was designed to support wartime logistics at a level of activity far exceeding that experienced during peacetime and that EDS procedures and operations in peacetime should be similar to those anticipated in wartime. DOD noted that, under these circumstances, the EDS airlift system cannot be operated on a daily basis as a common-user, scheduled airlift system and must remain focused on providing direct support to tactical fighter aircraft. We agree with those observations, but, as discussed in appendix III, we also believe that the Air Force should make the system as efficient and effective in peacetime as practicable. Attempting to make a wartime system efficient in peacetime need not necessarily conflict with its wartime objectives.

The status of these issues, including the actions USEUCOM and USAFE have taken to address them, is discussed in appendixes II through IV.

EDS Effect on Tactical Aircraft Readiness

The Air Force has not quantified the effect that EDS has had on tactical aircraft readiness. However, available data indicated that EDS has not contributed significantly to reducing the time it takes to resolve USAFE's tactical aircraft MICAPS.[1] For example, an average of 3.5 days were needed to satisfy a MICAP in fiscal year 1985 when EDS began operations; in fiscal year 1987, when EDS aircraft were fully operational, the average time was about 3.7 days. Reducing MICAP times using lateral support[2] was a principal peacetime benefit the Air Force projected from EDS. In addition, nearly all of USAFE's MICAPS are satisfied from sources other than EDS warehouse stocks at Kemble, and about two-thirds of EDS aircraft cargo is non-mission critical. On the basis of the information we obtained, EDS aircraft appears to be providing largely routine airlift.

Attention Given to Measuring Peacetime EDS Benefits

USAFE does not regularly collect quantitative data to determine the effect EDS has on tactical aircraft MICAPS. USAFE officials said that because USAFE is an operational command, it is not functionally organized or staffed to collect and analyze that type of data. USAFE officials said that they routinely monitor the EDS system by reviewing (1) the daily operations of the system, (2) a MICAP database, and (3) fighter aircraft support reports. Each is discussed in further detail below, along with the limitation each has in providing a complete basis to measure the effect of EDS.

- USAFE monitors the daily movement of MICAP parts (i.e., parts needed to enable an Air Force system to perform its mission) through a daily terminal cargo backlog report. This report lists each USAFE airlift terminal and airlift clearance authority[3] backlog by priority, piece, and weight. It is submitted daily to the EDS control center and used to determine the next day's cargo allocation. If a MICAP part movement is delayed for some reason, USAFE logistics transportation officials know of the delay, as do higher command officials. USAFE officials believe that this report is their best check on the timely movement of MICAP parts. Even though the daily report is valuable in expediting the movement of individual parts, it does not provide historical data, such as the number of MICAP parts transported on EDS aircraft, needed to assess the overall effect of EDS on tactical aircraft readiness.

[1]The term MICAP is used to describe those aircraft that are not fully mission capable due to a lack of spare parts.

[2]Lateral support occurs when a base obtains a needed spare part from on-hand stocks of another Air Force base rather than from depot wholesale stocks.

[3]Organization responsible for managing the flow of cargo through MAC airlift terminals.

- The Air Force Logistics Command (AFLC) maintains the existing MICAP data system, a data bank on MICAP spare parts. It shows the length of time taken in eliminating MICAPs in the European theater as well as other areas. However, it does not identify those MICAPs resolved solely by EDS.
- USAFE also prepares daily fighter aircraft support reports. The reports show the USAFE and non-USAFE units being supported by EDS. However, the reports do not show the number of MICAP parts moved or the MICAP times involved.

None of the monitoring methods, as generally used by USAFE, specifically measures the effect EDS has had on MICAP conditions.

Although USAFE does not collect data for measuring the effect of EDS on MICAPs, it has studied this topic. One study reported that information from the MICAP data system showed a reduction in average MICAP times from 5.1 days in January 1985 to 3.5 days in September 1986. The study showed that 27 to 44 percent of USAFE's MICAPs during the period January to September 1986, satisfied through lateral support, were moved by EDS. The Air Force presented these data in February 1987 during hearings before the Subcommittee on Defense, House Committee on Appropriations, to demonstrate the effectiveness of the EDS program.

We identified the following three problems with the USAFE study.

- MICAP data provided to us by USAFE for fiscal years 1985 through 1987, differ significantly from the data reflected in USAFE's study. For example, our analysis of USAFE's data showed that the average MICAP time was 3.55 days in January 1985 and 2.64 days in September 1986. The supply official in charge of the USAFE study could not explain the difference.
- The USAFE study looked at all USAFE MICAPs, as opposed to focusing on tactical aircraft MICAPs and other items for which EDS was established.
- Other factors that influence MICAP times were not considered in the study. For example, USAFE base supply officials stated that one factor contributing to the improved MICAP conditions in recent years was the increased availability of spare parts throughout the European theater. Our tests, comparing the fourth quarters of fiscal years 1985 through 1987, also suggest that the improved availability of on-base supplies was a factor in improving USAFE's MICAP conditions during that 3-year period, as discussed in the following section.

Routine or scheduled EDS airlift in peacetime (about two-thirds of the EDS flying hours in 1987) should be as cost effective as practicable while demonstrating a positive effect on peacetime readiness (e.g., by reducing

the number of tactical aircraft MICAPs). The Air Force does not have a system to measure EDS effects, but such a system could probably be developed by using its MICAP data system, aspects of which are discussed in the following section. Without a reliable readiness benefits measurement system, USAFE cannot be sure that EDS is adequately performing its mission or that the system, as currently operated, is the best way to satisfy that mission.

In its comments on a draft of this report, DOD agreed that the Air Force has a system specifically "...designed to enable overall evaluation of supply management..." and EDS is part of the Air Force supply system in Europe. However, DOD believes that more detailed data on EDS operations may not be meaningful because of the limited peacetime operations supported by EDS. DOD's position is that additional visibility over EDS would not warrant the additional resources necessary to modify or restructure the existing MICAP system to achieve that benefit.

EDS Effect on MICAP Conditions

Limited available data do not demonstrate that EDS has had a positive effect on MICAP conditions. Table II.1 shows that MICAP times dropped in fiscal year 1986 during EDS' first year of full operations and that MICAP times increased in fiscal year 1987 above what they were when EDS began operations in fiscal year 1985.

Table II.1: Average Time of USAFE MICAP Incidents Satisfied Through Lateral Support

Figures in days

	Fiscal year		
Month	**1985**	**1986**	**1987**
October	3.31	3.60	3.16
November	3.85	3.89	3.17
December	3.55	3.24	2.93
January	3.55	2.91	4.02
February	3.58	3.10	3.72
March	3.04	3.44	3.41
April	9.01	2.90	3.35
May	3.29	3.31	4.07
June	3.47	2.85	4.00
July	3.18	2.61	4.03
August	3.44	2.93	4.82
September	3.43	2.64	4.20
Average	**3.47**	**3.12**	**3.70**

Note: A MICAP incident begins when the need for a part is identified and ends when that part is actually supplied to the organization that needs it

An official from the 10th Military Airlift Squadron said that the C-23 flying hours were cut back 28 percent from October 1986 through May 1987 leading to a reduction in service. Table II.1 shows that reinstatement of full service did not produce a positive effect on MICAP times.

DOD officials disagreed with our interpretation of the data in table II.1 and its relevance to an analysis of EDS effects. They said that lateral support before October 1985 was the exception and only attempted on a case-by-case basis. They further explained that lateral support is now the norm and provided data showing that the extent to which USAFE's systems were not mission capable due to supply (including tactical aircraft MICAPS) had generally improved over the last several years (i.e., 1982 through 1988). However, our review of data pertaining to USAFE's MICAP conditions and the means of satisfying them showed that USAFE's reliance on lateral support to resolve its MICAP conditions ranged only from 18 to 21 percent of the time during fiscal year 1984 through fiscal year 1987, as shown in table II.2. In other words, USAFE's reliance on lateral support for satisfying USAFE MICAPS has remained about the same since EDS began in 1985.

Table II.2: Comparison of Methods of Resolving USAFE MICAPs

Figures in percent

Fiscal year	Lateral support[a]	Depot support[b]	On-base support[c]	Total
1984[d]	18	[e]	[e]	100
1985[f]	21	25	54	100
1986[f]	19	17	64	100
1987[f]	19	23	58	100

[a]Support primarily from other Air Force bases located in Europe.

[b]Support primarily from Air Force, Defense Logistics Agency, and General Services Administration depots in the United States. We estimate that 4 percent of USAFE depot-supplied MICAP items came from the Kemble EDS warehouse. Compared to all sources of supply, the Kemble warehouse satisfied only 2 percent of USAFE's MICAPs.

[c]Examples could include standard base supply stocks, war reserves, cannibalization, and other types.

[d]Based on the period of September 26, 1983, to September 24, 1984.

[e]Not determined.

[f]Based on data for the final quarter of the year.

As shown in table II.2, the relative reliance on lateral and depot support for resolving MICAP conditions was less in 1986 and 1987 than at the beginning of EDS in 1985, even though the overall USAFE MICAP condition

improved during the period of 1985 through 1987. Therefore, other factors, including increased availability of spare parts at the USAFE bases, appear to have been the primary contributors to the overall MICAP improvement. Also, data from the Air Force's automated MICAP tracking system indicate that the number of active USAFE MICAP conditions was about 11 percent less in 1987 than in 1985, suggesting that the increased availability of spare parts at the bases may have prevented systems from experiencing a MICAP condition or that other factors (e.g., new systems, more proficient maintenance, etc.) may have helped to reduce the number of USAFE MICAP conditions.

Another potential measurement of the effect that EDS has had on USAFE MICAPs is the relative quantity of MICAP parts transported by EDS compared to the quantity of MICAP parts transported by MAC's normal intratheater airlift service. For example, October 1987 data show that 38 percent of the EDS cargo shipped from Zweibruecken Air Base (center of EDS operations) were mission critical. However, 42 and 44 percent of MAC's cargo shipped from Ramstein and Rhein-Main Air Bases (MAC terminals), respectively, were at that level of priority. The Ramstein and Rhein-Main terminals receive cargo from depots located in the United States. While we are not suggesting that October 1987 is representative of an annual period, we believe it is one indication of the relative importance of EDS and other sources of supplies in peacetime.

We attempted to assess further EDS' role in reducing MICAPs by examining a sample of aircraft and missile MICAPs occurring from August through September 1987. We used the MICAP database to select our sample and asked USAFE to collect data on MICAP times, sources of supply, and modes of transportation. Our analysis of the USAFE-provided data showed that C-23s were used to deliver aircraft and missile MICAPs about 34 percent of the time. Our analysis also showed that only about 2 percent of USAFE'S MICAP parts from all sources came from the Kemble warehouse. Although the low level of activity at Kemble for resolving MICAP conditions by itself does not diminish the importance of the entire EDS, it raises a question concerning the value of operating that warehouse in peacetime. An alternative would be to discontinue routine operations at Kemble, treating those stocks as prepositioned wartime stocks, and use the stock in peacetime only during emergencies or training and to avoid expiration of their shelf lives. EDS forward stockage operating costs are discussed in appendix III.

Measures Taken to Increase EDS Aircraft Usage and Efficiency

Although EDS is a wartime system, its use in peacetime should be as efficient, effective, and economical as practical. The cost per pound to ship by EDS is many times higher than the cost to ship by other MAC aircraft. To reduce costs, measures have been taken to increase EDS aircraft usage and efficiency.

Cost to Ship by EDS

The average EDS shipping cost per pound is many times higher than shipments by other MAC aircraft in Europe. Also, the forward stocking of items in a low demand in Europe and stocks that must be reshipped later to other theaters or back to the United States to satisfy requirements at those locations cause the cost of EDS stocks per issue to be high.

Cargo Cost

The high EDS shipment costs may be partly the result of a low usage rate for the C-23 aircraft. Also, the small number of mission-critical spare parts issued from the Kemble forward stockage warehouse and transported to Germany 10 times a week cause the cost per issue to be higher than necessary to satisfy mission-critical needs within DOD standards.

C-23 Usage

The percentage of available C-23 cabin load used, referred to as usage rate, has averaged less than 37 percent of the C-23s' weight-carrying capability. Table III.1 shows usage rates for EDS from 1985 through 1987.

Table III.1: C-23 Usage Rate for USAFE Cargo Routes by Month

Figures in percent

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1985	•	•	•	23	24	18	18	23	26	26	30	27
1986	26	28	30	31	29	28	32	34	39	36	37	34
1987	38	40	39	46	36	58[a]	58	58	64	56	63	56

[a]USAFE and the 10th Military Airlift Squadron changed their method for computing and reporting C-23 usage beginning in June 1987.

The apparent increase in use, which began in mid-1987, was mostly the result of a change in the calculation method and not to higher actual use. For example, calculations were changed to begin counting special airlift missions and exercise support flights as 100 percent used, regardless of actual payloads carried by the aircraft. In addition, positioning flights to move an empty plane to the location where it will start its route was eliminated from the calculation. The effect of the new calculation

method was to increase the reported usage for USAFE cargo routes in June 1987 from 38 percent calculated by the previous method to 58 percent by the new method.

As the Air Force took measures to open the system to non-Air Force use, some increase in C-23 usage occurred. As these measures expand further and the system's availability becomes more fully understood by new potential users, EDS efficiency should improve. However, EDS shipping costs are currently much higher than other MAC costs, as discussed in the following section.

Comparison of EDS and MAC Shipping Costs

We recognize that EDS, with its current design, may not become as cost effective as routine MAC airlift. However, we have compared EDS shipping costs with MAC shipping costs to illustrate the cost range between those two transportation modes. The EDS aircraft carried 4,629,790 pounds, or an average of 385,816 pounds per month, from November 1986 through October 1987. On the basis of fiscal year 1987 operating costs of $25 million, excluding forward stockage and LOG C^3 operating costs, the average EDS shipping cost per pound for the 12-month period was $5.40. This per pound cost represents only the transportation component of EDS.

In its comments on a draft on this report, DOD disagreed with our method of comparing MAC and EDS shipping costs and stated that the total freight transported by EDS aircraft during the 12-month period ending January 1989 increased to 6.2 million pounds of freight and nearly 3,200 passengers, increasing the usage rate to 64.5 percent. This increase would decrease the estimated cargo transportation cost to about $4.00 per pound. Although $4.00 per pound is still many times the cost of other MAC services, the decrease illustrates the benefits to be achieved by increased usage of the aircraft, and we believe that even further increases in the usage of those aircraft are possible. The EDS transportation of persons further decreased the incremental system cost, even though a C-23 aircraft is primarily a freight carrier and the cargo section is only equipped with six seats. DOD estimated the annual operation and maintenance cost of EDS aircraft would continue at about the same level (i.e., $12.6 million). The operation and maintenance cost for fiscal year 1987 was $12.7 million, which, when added to the other costs (personnel, spare parts, contractor support, etc.), total $25.2 million, or about the same as the 1987 costs used in our analysis. We have revised our cost data to reflect established MAC costs of transportation for both

DOD users and foreign military sales users, which include the other cost elements contained in the EDS cost computations.

Table III.2 illustrates that MAC airlift costs per pound are significantly lower than EDS costs per pound for shipments between selected EDS locations in Europe for fiscal year 1988.

Table III.2: MAC Channel Airlift Rates Between Selected EDS Locations in Europe

	European region	MAC Costs[a] per pound		
		0-439 lb	2200-3599 lb	3600 lb & over
Ramstein Air Base, Germany, to	Central			
RAF Bentwaters, United Kingdom	Northern	$0.103/0.182	$0.072/0.152	$0.063/0.143
Camp New Amsterdam/Soesterberg, the Netherlands	Central	.053/.094	.037/.078	.032/.073
Berlin, Germany	Central	.082/.145	.057/.120	.050/.114
Aviano, Italy	Southern	.082/.145	.057/.121	.050/.114
Naples, Italy	Southern	.186/.330	.130/.274	.114/.259
Sigonella, Sicily	Southern	.246/.437	.172/.363	.152/.343
Torrejon, Spain	Southern	.203/.361	.142/.300	.125/.283
Rhein-Main Air Base, Germany, to	Central			
Aalborg, Denmark	Northern	.117/.208	.082/.173	.072/.163
Fornebu/Oslo, Norway	Northern	.197/.350	.138/.290	.121/.274
Prestwick, United Kingdom	Northern	.165/.294	.116/.244	.102/.230
Decimomannu/Sardinia, Italy	Southern	.183/.325	.128/.270	.113/.255

[a]MAC costs were calculated for both the channel service amounts that would be charged to DOD organizations and the higher amounts that would be charged to non-government organizations (e.g., under the Foreign Military Sales program), which include the cost of military personnel, investment, and other indirect costs. Both rates are relevant to EDS because the lower DOD user rate is the amount that would be charged to the Air Force if the EDS shipments were made by MAC channel service, whereas the Foreign Military Sales rate includes cost elements similar to the elements included in the average EDS per pound cost of $5.40. Most EDS packages weigh 55 pounds or less and are 3 cubic feet or smaller

These rates relate generally to the actual EDS coverage to date and therefore provide a relevant comparison to current EDS costs.

DOD believes that another factor to be considered in evaluating EDS is the cost advantage of training new pilots in EDS aircraft compared with the cost of training them in larger aircraft (e.g., C-141). It estimated that training in the C-23 aircraft results in annual savings of $16.7 million over what it would cost to train those pilots in the larger aircraft. We could not find any example of reduced flying hours of the larger aircraft that resulted from adding EDS aircraft to the Air Force inventory. A DOD official advised us that the Air Force was never able to get approval for

all the flying hours needed for the larger aircraft. EDS flying hours enabled the Air Force to cover part of those shortfalls, according to that official.

EDS Forward Stockage Operating Costs

Another factor that adds to the cost of supplying EDS spare parts to USAFE bases is the cost of maintaining EDS warehouse space in Europe. The cost of establishing and operating this warehouse space was originally justified based on the expectation that the spare parts would be used largely to satisfy critically needed material. Actual experience shows that this expectation has not been realized.

The Air Force planned to have three forward stockage warehouses, but only the one at Kemble is operational. The future of the other two warehouses is uncertain at this time. The warehouse planned for Torrejon Air Base, Spain, has been built at a cost of $481,058, but it is not being used for EDS. A USAFE supply official stated that AFLC delayed stocking the Torrejon warehouse until the base's future status had been resolved. An Air Force Headquarters official advised us in January 1989 that the Air Force will move its tactical aircraft away from Torrejon Air Base. The Air Force subsequently decided not to use the Torrejon warehouse for EDS storage, but it still is considering adding an EDS warehouse in Southern Europe (e.g., in Italy) to replace the Torrejon warehouse and in Central Europe (in Zweibruecken, Germany). However, the Air Force has not decided whether to construct additional EDS warehouses, pending the completion of an overall review of spare parts requirements and the effect these warehouses would have on the worldwide support to tactical air forces in both peace and war.

The Kemble warehouse's total operating costs for fiscal year 1987 were about $1.59 million, or $30,577 per week. On the basis of the EDS program director's mid-1987 estimate of an average of 500 shipments per week from Kemble, the EDS warehouse operating costs equate to about $61 per shipment and many times that much if the cost is allocated only to mission-critical shipments—the primary purpose of EDS. In addition, the EDS program director said that about 20 percent of the shipments from the Kemble site go to non-USAFE installations, including bases outside of Europe (e.g., in the Pacific theater or the United States), of which about 7 percent go to non-Air Force activities. Having low-priority material stored in Europe that has to be reshipped to another location increases handling and shipping costs.

In our 1986 report, we questioned the criteria used to select items for forward stockage and recommended that the Air Force assess their adequacy. We also reported that the Air Force was stocking (1) many items that did not meet the priority criteria established for EDS stockage and (2) more items than required for emergency needs. The program director said that some items were stocked because they met the criteria at the time they were stocked, but, due to later changes (e.g., improved parts reliability), some items no longer met the criteria. He said that all stocks are periodically reviewed and reduced as appropriate. In April 1987 Kemble listed 1,321 items (about 20 percent of the stock) that did not have any shipments during the preceding year.

The Air Force initially planned to stock frequently needed, mission-critical spare parts at three EDS warehouses in Europe—one warehouse to be located in each region. However, actual experience, during the last 2 months of fiscal year 1987 and first month of fiscal 1988, shows that relatively few MICAP shipments are made from Kemble, the first EDS warehouse placed in operation.

Efforts to Increase Usage and Efficiency

USAFE is having difficulty making EDS an economical and efficient peacetime operation. Air Force officials state that the system's wartime objective overrides the need for peacetime economies.

EDS Was Not Designed Around an Efficiency Objective

The Air Force did not consider operational efficiency during peacetime as a critical factor in designing EDS because it was designed as a wartime system. As discussed in our 1986 report, the Air Force did not initially plan for EDS to serve all potential users. Since the Air Force intended EDS to be a USAFE-dedicated system, the Air Force did not coordinate its design and use of EDS with other services and allies in accordance with DOD guidance to permit its most cost-effective use.

We also expressed concern that EDS would likely be underutilized, and we suggested opportunities for expanded use of EDS aircraft among the services and allies to achieve more efficient and effective EDS operations. On the basis of our review, we believe that some defense contractors operating in Europe also could be potential users of EDS services in peacetime as they would likely be in wartime.

To increase both aircraft usage rates and non-USAFE users of EDS, the Air Force

- issued instructions and procedures to base transportation offices, stating that (1) the offices should use EDS to move eligible cargo before using other modes of transportation and (2) established transportation time standards could be exceeded to ensure maximum C-23 use,
- provided the airlift clearance officials responsibility for routing specific intratheater cargo to EDS instead of to MAC channel and Army surface movement modes, the objective being to decrease total cargo movement time between theater aerial ports of debarkation and USAFE bases not directly serviced by MAC channel flights,
- initiated daily air terminal and cargo backlog reports, daily mission cargo allocation instructions, and more intense management of the daily EDS routes to make the system more responsive to users' needs,
- recommended a change to the USEUCOM directive governing the use of EDS to simplify access by U.S. Army, Europe (USAREUR) units by allowing them to approach a neighboring USAFE base Traffic Management Office directly to reserve space on a C-23, rather than going through an internal Army coordinating unit, as required, and
- publicized the availability of the C-23 for non-USAFE users.

We question whether the June 1987 USAFE instruction to the traffic management offices, requiring them to select EDS to move eligible cargo before using other transportation modes, was constructive. The instruction stated that transportation time standards for cargo movements could be exceeded to ensure maximum C-23 use. Increased use of the C-23 should be encouraged wherever sensible; however, the C-23 should not be used unless a more logical transportation mode has been considered, and increased C-23 use should not be achieved by delaying the shipment of cargo without realizing an economic benefit. Also, surface movement modes (e.g., trucks) should not be avoided unless such action is less costly, is necessary to meet time standards, helps to alleviate MICAP conditions, or results in significant wartime training benefit. Increasing C-23 use without benefit would not seem to be an appropriate reason for cargo rerouting to EDS and could distort the importance of the EDS aircraft in peacetime by overstating its net contribution to EDS' cost effectiveness.

We concur with some actions taken to increase C-23 use. For example, in June 1986 USEUCOM published a directive containing procedures for reciprocal air transportation between USAFE, USAREUR, and U.S. Navy, Europe (USNAVEUR) units. The procedures govern the use of EDS aircraft and provide for the air transportation of cargo and personnel of one service by aircraft operated by another service. According to USEUCOM, the

C-23s' peacetime airlift capability is not fully used by USAFE and is therefore available for use by the Army and the Navy. The USEUCOM directive concluded that the wartime capability provided by the EDS aircraft will be fully used by USAFE; however, we did not find any documented analyses to support this conclusion. The guidance could discourage non-USAFE use of the system in peacetime, since non-USAFE users also should operate in peacetime as nearly as practical to realistic wartime conditions.

USEUCOM criteria call for all U.S. intratheater cargo in Europe to be moved based on priority, not on which service owns or operates the aircraft. Since the USEUCOM commander controls all U.S. airlift in Europe in wartime, it would be reasonable for non-Air Force users of EDS aircraft to obtain access for EDS aircraft cargo space for mission critical cargo over Air Force non-mission critical cargo. However, the June 1986 USEUCOM directive suggests that EDS airlift would generally not be able to serve non-Air Force users in wartime, but USEUCOM and USAFE officials advised us that non-Air Force cargo would be accepted on EDS aircraft, if warranted by wartime requirements.

In July 1987 USAFE sought to alter USEUCOM procedures so that Army and Navy units could directly contact USAFE Traffic Management Offices to arrange movement of their cargo. USAREUR did not concur with the proposed change, since this procedure would bypass the 1st Transportation and Movement Control Agency, USAREUR's designated transportation coordinator. The agency is responsible for consolidating and coordinating USAREUR transportation requirements, and potential Army users of EDS airlift must contact the agency to gain access to the C-23s. At the completion of our fieldwork, USAREUR officials said an effort was underway to enable the respective Air Force and Army organizations to work together in handling Army shipments made on EDS airlift.

Cargo Transported for Non-Air Force Organizations

MAC and USAFE transportation officials said they do not monitor cargo transported on the C-23s for non-USAFE users. However, USAFE officials observed that C-23s were flying 12 Mediterranean routes specifically to serve Navy customers. A C-23 was serving the naval base at Sigonella, Sicily, 6 days a week and the naval base at Rota, Spain, 1 day a week. In addition, USAFE officials said that C-23s have provided support for USAREUR and USNAVEUR exercises (e.g., REFORGER 87 and OCEAN VENTURE 87, respectively). The Defense Courier Service has also used EDS airlift.

USNAVEUR and Defense Courier Service officials said that they did not track the amount of their cargo moved on the C-23. However, USAREUR tracked the amount of its cargo moved on the C-23s and provided us with statistics. The statistics showed that 14,968 pounds of cargo were moved by EDS C-23s in fiscal year 1986 and 124,476 pounds in fiscal year 1987. These figures represent 0.42 percent of C-23 cargo in fiscal year 1986 and 2.75 percent in fiscal year 1987. We were not able to determine what percent of USAREUR airlift is performed by the C-23. In our 1986 report, we stated that there were "...opportunities for enhancing theater readiness and transportation efficiencies by extending EDS airlift service to other U.S. and allied users." We also cited examples of potential non-USAFE users (i.e., Army Air Defense Command units and selected allied units), which could benefit by having access to EDS airlift, particularly in wartime, and whose usage would contribute to the overall efficiency of the system. We noted that many of the Army Air Defense Command and allied units had similar high-priority airlift needs and were located in close proximity to planned EDS routes. Many air defense and allied units are colocated with USAFE bases. We also noted that this kind of U.S./allied cooperation was consistent with earlier observations and conclusions of other studies, including one by The Rand Corporation.

The Air Force has made an extensive effort to open up EDS service to U.S. Army, Navy, and Defense Courier Service users in Europe and has had some success in doing so. EDS service has been made available only "on a non-interference basis," meaning that (1) USAFE cargo has priority over non-USAFE cargo, regardless of the urgency involved, and (2) USAFE will not guarantee routes, space on the aircraft, or needed frequency of service. Also, USAFE wants USAREUR to allow its EDS users to bypass the normal Army centralized cargo-movement control offices and deliver its cargo directly to the traffic management officers at USAFE bases, but USAFE will not assume the normal tracking responsibilities for the cargo. USAREUR insists that bypassing the control offices constitutes an unacceptable risk for its users.

We believe that EDS would be a more effective system if it followed sound transportation procedures, recognizing the designated criticality and priority of all users' needs and moving cargo based on priority.

Even though this would be a small departure[1] from the stated EDS purpose, it could enhance the overall value of the system in both peacetime and wartime, and some officials believe EDS would operate that way in wartime anyway.

In its comments on a draft of this report, DOD stated that efforts to increase the peacetime use of the EDS airlift have been successful within the limitations imposed by the wartime mission of EDS. DOD recognizes the limitation imposed by the non-interference restriction on the use of EDS by other DOD components, but it believes the limited scope of EDS in wartime dictates retention of the non-interference provision for peacetime use. We agree with the use of a "non-interference" provision if it is limited in its application to the Air Force's mission-critical cargo. However, we believe that the Air Force should be able to develop a more efficient EDS peacetime operation without interfering with its wartime goals. For example, if the Air Force applies the non-interference provision to deliver low-priority cargo in peacetime for its own use ahead of higher priority non-Air Force cargo, this would not appear to advance its wartime mission.

[1] We refer to the broader concept of EDS operation as a "small departure" because it could be implemented without disrupting the movement of USAFE mission-critical cargo, the principal justification for EDS.

Another Suggested Alternative

Use by Reserves as a Peacetime Mission

The Air Force, Congressional Research Service, Rand Corporation, and others have studied the feasibility of the reserve forces assuming increased peacetime missions[2] These organizations generally agree that the reserves can effectively and economically perform various missions in peacetime that are currently performed by the active forces. Reserve forces are less costly than active forces in many respects. For example, defense experts have estimated that operation of reserve airlift units cost between 50 and 65 percent less than similar active airlift units. Other research shows the cost range to be wider (e.g., 30 to 70 percent), but virtually all such research suggests significant economies without lessening mission readiness, given equal priority on resources. The lower operating level of the reserves results in lower costs for operations, maintenance, and pay, and the career patterns of reservists produce lower retirement costs.

Tactical airlift, which could include the air transportation component of EDS,[3] has been identified by the Air Force Office of Chief of Staff as "very appropriate" for a reserve mission.[4] About 60 percent of the Air Force's tactical airlift aircrews are assigned to the reserves, and this

[2]U.S. Air Force, Office of the Chief of Staff, Air Reserve Forces 2000: The Total Force Entering the 21st Century, April 6, 1983.

Reserve Forces Policy Board, Reserve Component Programs, Fiscal Year 1987 (Annual Report).

Congressional Research Service, The Mix of United States Active and Reserce Forces, November 9, 1983 (83-196F).

Congressional Research Service, National Guard Overseas Training Missions: An Issue for U.S. Military Manpower Policy, November 21, 1986 (86-181F).

Reserve Forces Policy Board, Active/Reserve Force Mix Report, December 1984.

The Rand Corporation, Cost Implications of Transferring Strategic Airlift C-141s to the Air Reserve Forces, February 1985 (Note N-2252-AF).

U.S. Navy, Center for Naval Analyses, A Report to the Congress on the Navy's Total Force, February 1984.

[3]DOD defines tactical airlift as the means by which personnel, supplies, and equipment are delivered to fighting units or final user destinations within a single theater by air-land or air-drop, as requirements dictate.

[4]U.S. Air Force, Office of the Chief of Staff, Air Reserve Forces 2000: The Total Force Entering the 21st Century, April 6, 1983, p. 12?

percentage could increase according to some defense authorities. In general, the principal limiting factor to increasing the reserves involvement in tactical airlift is the possible need for additional aircraft for training. However, the Air Force and reserves have concluded that this alternative would not be practical for EDS.

Use by Reserves Not Practical Under EDS' Current Peacetime Operating Philosophy

The Air Force and the reserves explored the feasibility of reserve units operating EDS in peacetime. They concluded that such an undertaking would tie up too many of the reserve units and result in an extensive amount of temporary duty travel back and forth between the United States and Europe.

In 1987 and again in early 1988, the reserves were asked to comment on a suggestion by the Senate Committee on Appropriations that EDS be made a reserve mission in peacetime. Reserve officials responded that assuming such a mission would be difficult, requiring additional amounts of temporary duty and travel funds for aircrews and support personnel to rotate between the continental United States and Europe to operate the system as it is presently operated. As a result, they generally concluded that these costs would escalate the EDS costs past its current funding level, even though a cost analysis was not done to support that conclusion. Air Force and reserve officials said that no approach other than the continuation of the existing peacetime EDS had been explored.

Reserve officials said that they could operate an EDS-type system if the assigned mission was limited to maintaining a ready wartime system. However, according to some of those officials, to do so at least the following would be required.

- The peacetime EDS operating philosophy would have to be reevaluated and directed primarily to maintaining a system ready for war, without major peacetime taskings in Europe.
- An EDS contingent would have to operate full time in Europe with either active or reserve forces.
- A small fleet of EDS aircraft would have to be physically located in the United States to train reservists.
- A peacetime mission should be identified for the U.S.-based EDS aircraft.
- Plans would have to be developed for the EDS continental United States aircrews and support personnel to participate periodically in European training.

The reserves also stated that a major problem in operating the system would involve the timely deployment of U.S.-based EDS aircraft to Europe in the event of an outbreak of hostilities. For example, the deployment of C-23s from the United States to Europe, even if the aircraft were assigned to reserve units in the northeastern part of the United States, could take 4 to 5 days.

LOG C^3 System Continues to Experience Development Problems and May Require More Funds

The Air Force continues to experience difficulty in completing development of an effective LOG C^3 system for EDS. Air Force officials advised us at the time of our review that some of the problems could be resolved by the EDS LOG C^3 contractor. However, 17 problems, which the Air Force considered significant, are outside the scope of the contract, and some of these problems would require other Air Force system modifications before the EDS LOG C^3 problems could be addressed. The LOG C^3 system would require more funds to increase the scope of the contract to cover the 17 problems and serve all wartime locations. However, an Air Force official advised us in January 1989 that the Air Force now believes it can operate the LOG C^3 system with some inconvenience and "workarounds" (i.e., improvisation); therefore, the Air Force does not currently plan to increase the scope of the LOG C^3 contract to cover these problems.

Although 22 computers had been installed in Europe as of January 1988, the LOG C^3 system was not yet operational and was not planned to be fully activated until sometime in fiscal 1989, over 2 years behind schedule. The EDS computer hardware has been installed at the USAFE main operating bases and other locations, but some of the related software was still under development. A test of the software in the fall of 1987 revealed significant problems to be resolved, including the need for modifications not covered by the LOG C^3 contract. USAFE officials stated at that time that additional funding would be needed to complete the LOG C^3 system; the amount of such funding had not been determined at the time of our fieldwork. However, the Air Force has now decided that the LOG C^3 system can operate without the suggested modifications.

The LOG C^3 system is intended to provide an automated decisionmaking capability for the USAFE logistics community. It is expected to provide the capability to locate sources, make allocation decisions, and direct the movement of mission-essential spares. Full EDS benefits cannot be realized until the LOG C^3 system is fully operational, according to Air Force officials.

Computers Are in Place at Selected Locations

A USAFE official said that USAFE has installed the computer hardware necessary to begin operating the LOG C^3 system. As of January 1989, a total of 22 computers had been installed at 20 main operating bases, the Kemble forward stockage location, and the USAFE readiness center. Of these computers, 18 are connected to the Defense Data Network.[1] The

[1] A computer-based capability built to fulfill DOD's worldwide communications needs.

four that are not part of the network use telephone modems to connect with the LOG C^3 computers at other bases. The official said that an additional 17 bases with terminals and printers are linked to 1 of the 20 main operating bases having LOG C^3 computers.

Since the hardware is in place and connected directly or indirectly to the Defense Data Network, USAFE has set up a LOG C^3 electric mail (E-Mail) service. It uses the E-Mail service to send daily route schedules for the C-23s, receive cargo backlog reports from the bases in the system, and send out allocations for cargo space for the next day's missions.

Software Problems Continue

To effectively and efficiently accomplish its originally intended mission, the LOG C^3 system must be able to interface automatically with base supply computers to determine if MICAP spare parts are in stock. An operational test of the system's software was made at four European sites during the October/ November 1987 time frame. The test revealed that interface problems continued to exist and that the LOG C^3 system did not meet contract requirements. The test identified 36 software deficiencies that needed to be corrected.

Of the 36 deficiencies, 10 were considered non-critical, minor "cosmetics," or inconveniences, that is, a given function can be performed with minor user workaround procedures. Only 1 of these 11 deficiencies was covered under the LOG C^3 contract.

The remaining 25 deficiencies were considered critical to successful performance of software functions or required substantial user workarounds. These deficiencies caused transactions to be lost or improperly processed. The EDS program director said eight of these deficiencies are within the scope of the firm fixed-price contract and are correctable at no additional cost. However, according to the director, 17 deficiencies are outside the scope of the current contract. These problems occurred because the system had been in development for 4 years during which time the Air Force's supply operations and philosophy had changed. USAFE officials told us that they will likely request funding for add-on modifications to the contract during an upcoming program management review to cover the cost of correcting these 17 deficiencies. However, an Air Force official advised us in January 1989 that the Air Force now plans to initially operate the LOG C^3 system by working around those problems and does not plan to ask for funds for this purpose at this time.

System Will Not Serve All Wartime Locations

The Air Force plans to provide LOG C^3 capabilities to 39 European locations, including the USAFE logistics readiness center, all main operating bases, and the peacetime forward operating locations. As discussed in our 1986 report, these 39 locations represent about 26 percent of USAFE's anticipated wartime locations, even though EDS was intended to be primarily a wartime system.

AFLC's January 1985 EDS cost estimate for fiscal years 1983 through 1992 included $145.7 million for the LOG C^3 system. However, its December 1987 estimate for the same period reflected only $47.1 million for the LOG C^3 system—a decrease of $98.6 million. The EDS program director said the 1987 estimate did not include costs for full LOG C^3 system operational capability at many wartime locations. Therefore, the EDS costs could increase significantly if AFLC decides to request funds for the full wartime LOG C^3 system. However, the amount of that increase had not been determined at the time of our review.

AFLC does not expect to request funding for the remainder of the full wartime LOG C^3 system until after fiscal year 1992. However, the Air Force is reassessing its plans to expand the EDS LOG C^3 to take advantage of the capabilities of other systems currently in development.[2] The EDS program director said this could significantly reduce the costs of adding EDS to other wartime locations.

[2]An example of another system under development is the worldwide Air Force stock control and distribution system, which is also designed to provide improved visibility over the quantity, condition, and location of AFLC material, according to a system planning document. This new system is designed to replace 13 current Air Force data systems into 1 integrated on-line system and scheduled to become fully operational in September 1990.

Comments From the Assistant Secretary of Defense (Production and Logistics)

ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301-8000

PRODUCTION AND
LOGISTICS
(L/TP)

MAR 3 1 1989

Mr. Frank C. Conahan
Assistant Comptroller General
National Security and International
Affairs Division
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Conahan:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) Draft Report entitled, "TACTICAL AIRLIFT: Observations Concerning European Distribution Systems Operations," (GAO Code 392358 - OSD Case 7788-A), dated January 30, 1989.

The Department has reviewed the draft report and concurs with most of its findings. There are, however, some DoD views that differ from those of the GAO regarding the use of the European Distribution System (EDS) in peacetime and wartime.

The EDS has been the subject of continuing study and improvement by Air Force commands, other concerned DoD Components, and the Office of the Secretary of Defense. Actions, thus far, have increased the systems utilization and provided the background for logistics command, control, and communication enhancements that will be applicable to the entire U.S. Air Force.

The detailed DoD comments on the report findings are provided in the enclosure. The Department appreciates the opportunity to comment on the draft report.

Sincerely,

Jack Katzen

Enclosure

GAO DRAFT REPORT - DATED JANUARY 30, 1989
(GAO CODE 392358) OSD CASE 7788-A

TACTICAL AIRLIFT: OBSERVATIONS CONCERNING EUROPEAN DISTRIBUTION SYSTEM OPERATIONS

DEPARTMENT OF DEFENSE COMMENTS

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FINDINGS

FINDING A: Background: European Distribution System. The GAO reported that the European Distribution System (EDS) was designed to provide assured wartime distribution of mission-essential spare parts to repair U.S. tactical aircraft and ground-launched cruise missile systems at about 100 U.S. and allied installations throughout the European theater. The GAO found that, as of January 1989, the EDS consisted of (1) 18 C-23 aircraft to provide dedicated transportation of spare parts, related support equipment, and maintenance personnel between U.S. Air Force Europe (USAFE) bases, spare parts forward stockage locations, and several dozen other airfields and bases that USAFE would use in wartime; (2) two forward stockage sites to augment stocks of parts at air bases; and (3) a logistics command, control, and communications system (LOG C^3) to facilitate tactical aircraft spare parts identification and distribution decisions. According to GAO, the Air Force has options with the manufacturer to purchase additional aircraft. The GAO noted, however, that an Air Force official advised there were no plans to exercise that option.

The GAO observed that, based on a 1981 Rand Corporation Report, the Air Force projected an assured spare parts distribution system could generate between 15 and 300 additional operational tactical aircraft during the early stages of a European War. The GAO pointed out that as the range of the additional aircraft suggests, this projection is subject to a number of variables, including the nature and intensity of the conflict, number of aircraft that deploy and arrive in Europe on schedule, and number of aircraft attrited in battle.
(p. 1, pp. 7/GAO Draft Report)

Now on pp. 1, 6.

DoD Response: Concur. The DoD has no plans to procure additional EDS aircraft. In a wartime environment, there are many factors that influence sortie generation. As the concentration of tactical aircraft in the theater increases, the capability to generate additional sorties by providing dedicated logistics airlift is also enhanced. The dedicated EDS aircraft are the critical element

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enabling responsive support to the dynamic requirements of a combat environment. The EDS system is designed to respond to requirements ranging from the need for lateral support of critical part shortfalls to recovery of aircraft or generation of follow-on sorties from diversion airfields.

FINDING B: Status of the Three EDS Elements. The GAO reported that, in March 1985, the EDS began operating as a system with six light utility C-23 aircraft. The GAO explained that the initial EDS forward stockage site is located at RAF Kemble, United Kingdom; the second site is at Torrejon Air Base, Spain; and a third site is planned at Zweibruecken Air Base, Germany. The GAO found that only the Kemble warehouse is operational; it started making shipments in January 1985. The GAO noted that the Torrejon warehouse has been built, but its operational status was delayed awaiting resolution of the U.S./Spain base rights negotiations relating to the U.S. use of Torrejon Air Base. (The GAO noted that, since the review, the U.S. has decided to move it tactical aircraft out of the Torrejon Air Base; however, the decision concerning the EDS warehouse is still pending). According to the GAO, the Zweibruecken site was pending the results of a future threat assessment.

The GAO explained that a LOG C^3 firm-fixed-price contract was awarded in September 1984. The GAO found that the system has experienced software/hardware problems interfacing with other Air Force systems. According to the GAO, an operational test and evaluation, completed in November 1987, identified 36 interface problems, 25 of which the Air Force considered significant. The GAO found that eight of the problems were corrected and the system was retested in the October/December 1988 time frame. According to GAO sources, the remaining 17 problems caused the system operators inconveniences but did not prevent the system from performing its mission.

The GAO also found that the EDS life-cycle cost is estimated at $1.3 billion through FY 2002; through FY 1987, the program cost about $158 million. The GAO noted that EDS operating costs are estimated at $34 million a year during peacetime; however, these costs will increase if another warehouse is put into operation or the LOG C^3 coverage is expanded beyond the current location coverage, which is about 26 percent of the EDS wartime coverage. (p. 2, pp. 8-9/GAO Draft Report)

Now on pp. 1, 6-7.

DoD Response: Partially concur. The Air Force has recently decided not to activate the EDS warehouse at Torrejon Air Base, Spain. In response to a request from USAFE to activate a second EDS stockage site at Zweibruecken Air Base, Germany, the Air Force is currently

reviewing the overall spares requirements and the impact of the second site on worldwide support to tactical air forces in both peace and war. The USAFE has also requested that steps be taken to identify a third EDS warehouse location in Italy; however, a similar detailed study will be required before further pursuing this initiative.

Through FY 1987, the EDS program cost about $148 million, rather than the $158 million reported by the GAO. The initial forecast used by GAO when estimating a $1.3 billion life-cycle cost, projected $196 million for this same period. The GAO estimated an average annual EDS operating cost of $34 million; in 1987, the actual operating cost was $31 million and total expenditures to date, including acquisition costs, have resulted in an actual average annual operating cost of approximately $30 million. The DoD agrees that added warehouses will result in increased operating costs; however, it is pointed out that the $1.3 billion EDS life-cycle costs also included multiple warehouses. Similarly, the share of life-cycle costs attributed to the LOG C^3 is greater than actual experience, and projected costs are less than previously anticipated due to savings which will be achieved when expanding the system to all the planned wartime locations. Actual EDS costs have been significantly lower than those reflected by the GAO, and continuing aggressive management actions, which take advantage of previously unforeseen opportunities, will maintain this trend. Although a formal life-cycle cost has not been recently developed for the EDS, the DoD estimates that the EDS life-cycle cost will be far lower than reflected by the GAO, possibly as much as 30 to 45 percent lower.

FINDING C: Previous GAO Report on EDS. In an October 1986 report (OSD Case 6923), the GAO concluded that the EDS might not accomplish its intended missions effectively and efficiently and would be more costly than justified to the Congress because of inadequate analysis and planning in preparation for the program. The GAO further reported that, (1) the planned cargo loads for EDS aircraft would often be less than aircraft capacity and, consequently would not meet the MAC or U.S. European Command (USEUCOM) requirements for ensuring the lowest cost airlift possible; (2) the Air Force should investigate or solicit the common use of the C-23s by the other Services and our allies to improve the efficiency of the aircraft; (3) three forward stockage sites might create unnecessary EDS warehouse space and the Air Force should not further consider building an EDS warehouse at Zweibruecken, Germany, until the need for such storage had been demonstrated (since adequate leased space was already available there); and (4) the LOG C^3 system capability

Now on p. 8.

for locating repair parts had not been fully automated. (p. 2, pp. 9-10/GAO Draft Report)

DoD Response: Concur. The summary of the previous GAO report is accurate, but it should be viewed in the context of the long-held DoD position on the EDS. The EDS was designed to support wartime logistics at a level of activity far exceeding that experienced during peacetime. Both, the number of tactical fighter aircraft to be supported and their operations tempo, are projected to far exceed the maximum level experienced in even the most demanding peacetime operation. Viewed in this context, the EDS peacetime operation, even at minimum levels of operation necessary for training and proficiency, cannot achieve high levels of utilization for mission capable (MICAP) or critical items. It is also important for the EDS procedures and operations applied in peacetime to be similar to those anticipated in time of war. For that reason, the EDS airlift system cannot be operated on a daily basis as a common user scheduled airlift system; it must remain a system principally focused on providing critical, direct support to tactical fighter aircraft as a by-product of the peacetime training mission.

FINDING D: Attention Given to Measuring Peacetime EDS Benefits. The GAO observed that the USAFE does not regularly collect quantitative data to determine the impact of EDS on the length of time that tactical aircraft are MICAP because the USAFE is not functionally organized or staffed to collect and analyze that kind of data. According to the GAO, the USAFE routinely monitors the operations of the EDS by reviewing, (1) the system daily, (2) a MICAP data base, and (3) the fighter aircraft support reports. The GAO found that each of these approaches, or sources, have limitations in providing a complete basis to measure the EDS impact, including the following:

- The Daily Movement of MICAP Parts. While this type of daily scrutiny is valuable in expediting the movement of individual parts, it does not provide historical data, such as the number of MICAP parts transported on EDS aircraft, needed to assess the overall EDS impact on tactical aircraft readiness.

- MICAP Data Base. The existing MICAP data system is a data bank on MICAP spare parts maintained by the Air Force Logistics Command. This shows the length of time taken in eliminating MICAPs in the European Theater as well as other areas. It does not, however, identify those MICAPs resolved solely by the EDS.

- Fighter Aircraft Support Reports. The reports show the USAFE units being supported by the EDS; however, the reports do not show the number of MICAP parts moved or the MICAP times involved.

Now on pp. 9-13.

The GAO concluded that, without a reliable readiness benefits measurement system, the USAFE cannot be sure that EDS is adequately performing its mission or that the system, as currently operated, is the best way to satisfy that mission. (pp. 2-3, pp. 11-14/GAO Draft Report)

DoD Response: Partially concur. The DoD concurs with the GAO summary of data used to view and manage the EDS, but does not agree with the GAO conclusion. The Air Force system for monitoring worldwide MICAP data is designed to enable overall evaluation of supply management policy and procedures. In view of the limited peacetime operations supported by the EDS, as discussed in the DoD response to Finding C, more detailed data may not provide a significant amount of meaningful information. The in-depth visibility suggested by the GAO would require increased resources to modify automated systems and provide added oversight in a form unique to the EDS. It is the DoD position that the added visibility suggested by the GAO, while useful, would not warrant the additional resources necessary to restructure the existing MICAP system.

Now on pp. 1, 11-13.

FINDING E: EDS Impact on MICAP Conditions. The GAO found the limited data that is available to determine the EDS impact on MICAP does not demonstrate that EDS has had a positive impact. The GAO observed that MICAP times were dropping in FY 1986, during the EDS first year of full operations; however, the data also shows that MICAP times increased in FY 1987 above what they were when EDS began operations. According to the GAO, reducing MICAP times using lateral support was a principal peacetime benefit the Air Force projected for the EDS. The GAO evaluation of the level of lateral support for satisfying USAFE MICAPs indicated that the relative levels have remained about the same since the EDS beginning in 1985. In fact, the GAO found that the relative reliance on lateral and depot support for resolving MICAP conditions was less in 1986 and 1987 than at the EDS beginning, although the overall USAFE MICAP condition improved during the 1985-1987 period. The GAO, therefore, concluded that other factors, including increased availability of spare parts at the USAFE bases, were the primary contributors to the overall MICAP improvement. In addition, the GAO evaluated USAFE filling of MICAPs and found that nearly all of the USAFE MICAPs are currently satisfied from other than EDS warehouse stocks at Kemble and that about two-thirds of EDS aircraft cargo is nonmission critical. Based on this information, the GAO concluded that EDS aircraft are providing largely routine airlift. (pp. 2-3, pp.14-18/GAO Draft Report)

DoD Response: Concur. The DoD does not expect major savings in MICAP performance directly or solely attributable to EDS in peacetime because of the suppressed level of tactical fighter activity and the

normal high level of attention given to MICAP situations. The EDS will have its greatest impact during periods of increasing tension and war when Forces in theater and the tempo of operations increase. Airlift provided by the EDS system is a by-product of the peacetime readiness training. To the extent that flying hours allocated for training can be used to provide peacetime airlift of any material, using the EDS and its procedures, additional valuable training is obtained and expenses that would be incurred for movement by other modes are avoided. In this regard, peacetime airlift may indeed be routine in nature but the training may yet be valuable if the wartime procedures are used to effect movement (see also the DoD response to Findings D and E).

FINDING F: Cost to Ship by the EDS. The GAO recognized that the EDS was a wartime system. The GAO concluded, however, that its use in peacetime should be as efficient, effective, and economical as practical. The GAO found that the average EDS shipping cost per pound is many times higher than shipments by other MAC service in Europe. In addition, the GAO found that the forward stocking of items in Europe having a low demand, and those that must be reshipped later to other theaters or back to the U.S. to satisfy requirements at those locations, causes the cost per issue to be high. The GAO acknowledged that the high EDS shipment costs may be partially the result of a low utilization rate for the C-23 aircraft and the fact that the small number of mission-critical spare parts from Kemble caused the cost per issue to be higher than necessary to satisfy mission-critical needs within DoD standards. (pp.2-3. pp. 19-23/GAO Draft Report)

Now on pp. 1, 14-17.

DoD Response: Partially concur. The DoD concurs that the EDS is a wartime system and that it should be operated in peacetime as economically and efficiently as possible (within the constraints of the wartime system). The Department does not, however, agree with the GAO method of comparing the cost of transportation only on MAC channel airlift to that for warehousing, LOG C^3, and transportation via the EDS. Additionally, the MAC channel rates are actual charges to users, which are funded from Service transportation accounts while users are not charged for movement on the EDS aircraft. The MAC channel tariffs only include the direct operating cost of the airlift system rather than the total cost for acquisition of facilities and equipment and other costs related to readiness and mobility requirements as were included by the GAO for the EDS. The projected annual operating costs of the EDS airlift element for FYs 1989-94 range between $11 million and $12.6 million, or about one-third the cost used by the GAO. In FY 1987, the EDS transported over 4.6 million pounds of cargo. In the 12 months ending in January 1989, the EDS transported over 6.2 million pounds of freight and

nearly 3,200 passengers and the utilization rate increased to 64.5 percent, all of which significantly decrease the EDS incremental system cost. Additionally, the EDS flying hours also provide low cost seasoning of Air Force pilots in their first years after undergraduate pilot training who will later transition into larger airlift aircraft. The lower cost training in the C-23 aircraft results in a savings of $16.7 million annually, which must also be considered when evaluating the cost of the EDS.

FINDING G: Efforts to Increase Utilization and Efficiency. The GAO found that the USAFE is having difficulty putting the EDS on an economical and efficient peacetime basis. The GAO explained that the Air Force did not consider operational efficiency during peacetime a critical factor in designing EDS because it was designed as a wartime system. The GAO observed that, since the Air Force intended the EDS to be a USAFE-dedicated system, the Air Force also did not coordinate its design and use with other Services and allies, in accordance with DoD guidance, to permit its cost-effective use. The GAO noted that, since the prior GAO report, the Air Force has implemented measures in an attempt to increase both utilization and non-USAFE EDS use, including, (1) issuing instructions to base transportation offices stating that they should select EDS to move all eligible cargo before using other modes of transportation; (2) providing airlift clearance officials responsibility for routing specific intratheater cargo to the EDS instead of to MAC channel and Army surface movement modes; (3) initiating daily air terminal and cargo backlog reports, daily mission cargo allocation instructions, and more intense management of the daily EDS routes; (4) recommending a change to the USEUCOM directive governing the EDS use to simplify access by U.S. Army, Europe; and (5) publicizing the availability of the C-23 for non-USAFE users. The GAO supported some of the Air Force actions taken to improve EDS utilization, but questioned the constructiveness of the instruction to traffic management officers requiring them to select EDS to move eligible cargo before using other modes. The GAO emphasized that increased use of the C-23 should not be accomplished without considering a more logical transportation mode or accomplished by delaying the shipment of cargo without realizing an economic benefit.

The GAO observed the follow-up review showed that the Air Force has made an extensive effort to open up the EDS service to U.S. Army, Navy, and Defense Courier Service users in Europe, and has had some success. The GAO pointed out, however, that the Air Force policy of making EDS available on a "noninterference basis" has created reluctance on the part of other potential users and suggested that relaxing this policy could enhance the overall value of the system in both peacetime and wartime. (pp. 2-3. pp. 23-29/GAO Draft Report)

Now on pp. 1, 18-22.

DoD Response: Partially concur. The DoD considers the efforts to increase the peacetime utilization of the EDS a success, within the limitations imposed by the wartime EDS mission (see also the DoD responses to Findings C-F). The DoD recognizes the limitation imposed by the "noninterference" restriction on use of the EDS by other DoD Components, however, the limited scope of the EDS in wartime dictates retention of the noninterference provision for peacetime use.

FINDING H: Use by Reserves as a Peacetime Mission. The GAO observed that the Air Force, Congressional Research Service, Rand Corporation, and others have studied the feasibility of the Reserve Forces assuming increased peacetime missions. According to the GAO, these organizations generally agree that the Reserves can effectively and economically perform various missions in peacetime that are currently performed by the active forces. The GAO points out that Reserve airlift costs are normally 50-60 percent of similar active airlift units. The GAO found that tactical airlift, which could include the air transportation component of the EDS, has been identified by the Air Force Office of the Chief of Staff as "very appropriate" for a Reserve mission. The GAO further found that the Air Force and Reserves have concluded this alternative would not be practical without a major redesign of the EDS. (pp. 2-3, pp. 29-32/GAO Draft Report)

Now on pp. 2, 23-25.

DoD Response: Concur. The DoD agrees that the airlift mission, in general, is very appropriate for Reserve Forces and the amount of strategic and tactical airlift resident in Reserve Forces is a testimony to our commitment to that concept. After extensive review by both the Air Force and Reserve Forces, however, it has been determined that Reserve Forces cannot operate the EDS as economically or as responsive as the current operation. This position was communicated to the Congress in hearings before the Senate Appropriations Committee on April 28, 1987, and March 24, 1988.

FINDING I: LOG C^3 Continues to Experience Development Problems and May Require More Funds. The GAO found that the Air Force continues to experience difficulty in completing development of an effective LOG C^3 for the EDS. The GAO observed that, although Air Force officials stated some of the problems with the LOG C^3 could be resolved by the LOG C^3 contractor, 17 problems (which Air Force indicated were significant) are outside the scope of the contract and some of the modifications would require other Air Force system modifications before the EDS LOG C^3 problems could be resolved. The GAO reported Air Force officials advised that additional funds would be required to correct the 17 remaining problems; however, the Air

Now on pp. 2, 26-28.

Force subsequently decided that the LOG C^3 system can operate without the suggested modifications. According to the GAO, the operation of the system will cause some inconvenience and work-arounds for operators, but will not prevent the system from performing its mission. (The GAO also noted that the Air Force reduced funding for the LOG C^3 system from $145.7 million to $47.1 million but that the remaining funding only provides coverage for 26 percent of the full wartime operational capability. The GAO further noted that the Air Force was reassessing the expansion of the LOG C^3 system to accommodate the capabilities of other systems currently in development which may significantly reduce the overall cost). (pp. 2-3, pp. 33-36/GAO Draft Report)

DoD Response: Concur. Full implementation of LOG C^3 for 39 EDS sites will be completed in April 1989. The LOG C^3 capability to the remaining EDS sites will be provided through enhancement of other standard Air Force systems that are currently under development. These enhancements are possible because of the experience gained in the EDS development program and will significantly reduce the overall cost to the Air Force to acquire the capability.

RECOMMENDATIONS

None

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