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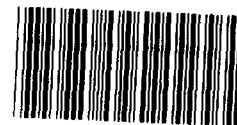
Testimony

For release
on Delivery
Expected at
9:00 a.m.
Thursday,
March 26, 1987

ACQUISITION OF THE C-17 AIRCRAFT

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Before the
Committee on Armed Services
House of Representatives
Subcommittee on Procurement and Military
Nuclear Systems



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Mr. Chairman, I appreciate the opportunity to discuss GAO's recent report, prepared at your request, on our evaluation of the Air Force's decision to continue to develop and to procure the C-17 aircraft rather than the C-5 aircraft to meet its long-range airlift goal. This topic has created considerable controversy since the late 1970's when the Air Force began to pursue the development of the C-X aircraft which became the C-17.

In essence, the Air Force has concluded that it would be preferable to pay the research and development and initial production startup costs for a new, smaller airlift aircraft in order to get the performance features and lower operating costs that it desires. In doing so, the Air Force chose not to increase its long-range airlift capability much quicker with the larger C-5 which is already in production.

The Air Force considered several alternatives, each made up of different quantities of C-5s or C-17s, and evaluated each in terms of operational utility, life-cycle cost, manpower requirements, force stabilization, and force modernization. Each alternative was structured to provide enough long-range airlift capability to (1) meet the goal of 66 million ton-miles per day (MTM/day) established by the Congressionally Mandated Mobility Study and (2) maintain the existing short-range airlift capability. The Air Force's conclusion was that the C-17 alternative was clearly superior in operational utility, life-cycle cost, and manpower requirements. The Secretary of Defense

and the Joint Chiefs of Staff have endorsed the plan to acquire the C-17. Funding for production of the first two C-17s is being requested for fiscal year 1988.

The Air Force has never had what it considers enough long-range airlift capability. In fact, even the 66 MTM/day level is considered a fiscally constrained goal and would not meet the airlift requirements of any of the major conflict scenarios.

Nevertheless, the cost to increase this country's long-range airlift capability, whether with the C-5 or the C-17, will be sizeable. The implementation of either alternative would require development and/or production funding of at least \$2 billion for each of the next 10 to 15 years and additional annual funding to operate and support the larger airlift force structure on an indefinite basis. For fiscal year 1987, about \$700 million was appropriated for the C-17 program. For fiscal years 1988 and 1989, DOD is requesting about \$2.0 billion each year for the C-17. Over the next five fiscal years, the cumulative funding requests for the C-17 program could approach \$14 billion. For the same time frame, the C-5 alternative would probably require over \$12 billion in funding.

In comparing the cost-effectiveness of the C-5 and the C-17, it is important to keep in mind that one is comparing costs and performance of an existing aircraft--the C-5--with the estimated

costs and designed performance characteristics of an aircraft which does not yet exist--the C-17. Although the Air Force considers the C-17 to involve low technical risk, the actual cost and capabilities of the aircraft may not be fully known until the early to mid-1990s.

Nonetheless, our overall conclusion is that the Air Force's analysis supporting its decision to buy the C-17 was reasonable. Although we do not agree with all aspects of the analysis, we do believe that it adequately supports that decision. If the C-17 comes close to meeting its cost and performance objectives and is used for routine direct delivery in wartime, it should provide overall advantages to the Air Force in terms of operational utility, life-cycle cost, and manpower requirements.

OPERATIONAL UTILITY

The Air Force conclusion that the C-17 offers superior operational utility over the C-5 has created intense debate and has a major impact on the life-cycle cost of the alternatives.

The Air Force's analysis concluded that the C-17 would be operationally superior to the C-5 because of its projected capability to routinely deliver all types of military material directly to forward operating locations. The need for such a capability was identified in the Congressionally Mandated

Mobility Study. The Air Force does not believe that the C-5 can routinely and safely operate into such locations, which are likely to have not only short runways but narrow taxiways and limited facilities. The Air Force, based on its experience with the C-5, prefers to restrict its operations to airfields with larger runways and facilities.

With the C-17's projected capability to routinely deliver directly to forward operating locations, less material would have to be transshipped by truck, rail, or C-130 aircraft from the main bases (where most deliveries would otherwise have been made) to the forward operating locations. The Air Force believes that the C-17 can also be used to perform short-range shuttle missions--from main bases to forward locations or from one forward location to another--further reducing the need to tranship material by other means. On the other hand, the Air Force believes that, with the C-5, such transshipments would have to continue. Therefore, as older C-130 aircraft have to be retired, the Air Force would replace them with new C-130s under the C-5 alternative in order to maintain the existing short-range capability. However, under the C-17 alternative, the Air Force would not replace the C-130s because the C-17's capabilities are expected not only to compensate for the loss of the C-130s but to provide additional short-range airlift capability.

If the C-17 meets its performance objectives, there should be a clear distinction between the operational utility of the two aircraft. However, we disagree with the Air Force's analysis which assumes that the C-5 cannot deliver cargo to other than large airfields. The C-5 can probably operate into at least some forward locations and thereby reduce the amount of material needed to be transshipped. However, the C-17 should be more capable of routinely and safely landing at smaller airfields and to more efficiently operate within the restrictive facilities that are common to smaller airfields. Therefore, the C-17 should permit the Air Force to more fully implement the direct delivery concept as well as supplement the C-130 fleet by performing some short-range shuttle missions. While one can debate the specific difference, we believe that far fewer C-130s will be needed with the C-17 than with the C-5.

While we concur with the Air Force that the direct delivery concept could provide military advantages, we recognize that its implementation will require much more than the acquisition of a suitable aircraft to carry it out. For example, the operating and logistics plans of both the Army and Air Force will have to be modified in order to take advantage of the potential benefits of direct delivery.

REACHING THE 66 MTM/DAY GOAL

The Air Force projects that it will have a long-range airlift capability of about 49 MTM/day by 1989--about 17 MTM/day short of the 66 MTM/day goal. In selecting an airlift force structure, however, the Air Force wanted to not only alleviate that shortfall but to compensate for airlift capability projected to be lost as the aging C-141 aircraft reach the end of their projected service lives in the late 1990s. In its analysis, the Air Force decided to retire some C-141s in the late 1990's and to extend the service lives of the remaining C-141s by reducing their peacetime use. Those actions were expected to increase the airlift shortfall to about 27 MTM/day by the year 2000.

That decision has been criticized by those who believe the service lives of the C-141s can be extended at a relatively low cost, thus reducing the number of C-17s or C-5s that need to be bought. The Air Force is conducting a comprehensive analysis, which will not be completed until later this year, of the actions and resources needed to extend the service lives of the C-141s. While this analysis may decide the future of the C-141 fleet, it should not affect the decision to pursue the C-17 instead of the C-5.

To alleviate the projected shortfall of about 27 MTM/day, the Air Force calculated that 180 operational C-17s or 156

operational C-5s would have to be acquired as well as additional C-5s and C-17s for trainers/backups. The Air Force could reach the 66 MTM/day goal as much as 5 years earlier under the C-5 alternative because the C-5 is currently being produced at a relatively high rate while the first C-17 has yet to be built. However, the time required to meet the goal was not an overriding concern to the Air Force in its analysis.

The quantity of aircraft needed depends primarily on their projected average payload and wartime utilization rate. The average payloads were determined by the Air Force by using representative scenarios and a computer loading model that considers the material to be moved and the aircraft available to move it. In most cases, the aircraft are filled to their volume capacity well before their maximum weight capacity. Because the C-5 has a greater volume and weight capacity, its projected average payload is about 20 tons greater than the C-17's.

The wartime utilization rates are a projection of the time each aircraft is expected to fly per day during the first several weeks of an emergency. Those rates depend on the time needed by each aircraft for loading, unloading, maneuvering on the ground, servicing, and required maintenance. Because it is expected to be more maneuverable, reliable, and maintainable, the Air Force estimates that the C-17 will be capable of flying 15.2 hours per day as compared to 12.5 hours per day for the C-5.

Since its original analysis, the C-5's utilization rate has been lowered to 11.0 hours per day by the Air Force because of, among other things, its high maintenance requirements. We believe that the C-17's utilization rate should also be reduced because, the Air Force, in its calculation, did not take into account all of the time that may be needed to perform short-range shuttle missions. Our analysis indicates that a more realistic rate for the C-17 would be about 14.4 hours per day. What this means is that more of either aircraft than originally projected by the Air Force will be needed to meet the 66 MTM/day goal. Thus, the acquisition and life-cycle cost of either alternative will likely be greater than the Air Force has estimated.

LIFE-CYCLE COSTS

In its life-cycle cost comparison of 180 operational C-17s and 156 operational C-5s, the Air Force projected that the C-17 alternative would cost about \$29.3 billion (fiscal year 1986 dollars) less than the C-5 alternative. Although we do not agree with all of the assumptions used in the Air Force's analysis, our analysis suggests that the C-17 could cost about \$16.7 billion (fiscal year 1986 dollars) less than the C-5 on a life-cycle basis.

The cost to acquire the C-17 will be about \$10.5 billion more (fiscal year 1986 dollars) than the cost to acquire the C-5. However, over a thirty year period, the C-17's lower operating and support costs should more than offset its higher acquisition costs. The C-17 will use proven commercial engines that are much more fuel efficient, reliable, and maintainable than those used on the C-5. Also, much development attention, including extensive contractual warranties, is being placed on the aircraft's overall reliability and maintainability. It appears that the C-17 alternative should cost about \$440 million less per year than the C-5 alternative to operate and support or about \$13.2 billion less on a life cycle basis.

The largest portion of the C-17 alternative's cost savings, however, results from the lower number of C-130s to be retained in the airlift inventory. The projected cost to replace the C-130s to be retired is about \$3.5 billion (fiscal year 1986 dollars). The cost to operate and support 180 operational C-130s would be about \$350 million per year or about \$10.5 billion over 30 years. Since these costs--totaling about \$14 billion--would be incurred only under the C-5 alternative, the life cycle cost differential increases significantly in favor of the C-17 alternative. The specific difference in C-130 quantities between the two alternatives could be more or less than the 180 projected by the Air Force. However, we agree with the basic Air Force

assumption--that far fewer C-130s would be needed under the C-17 alternative than under the C-5 alternative.

More C-17s or C-5s than projected by the Air Force will probably be needed to meet the 66 MTM/day because of likely reductions in each aircraft's wartime utilization rate. As the quantity of each aircraft increases, the cost to produce each additional C-17 should be close to the cost to produce each additional C-5. Therefore, since each C-17 would cost much less to operate and support than each C-5, additional quantities of aircraft would increase the cost advantage of the C-17 alternative.

MANPOWER REQUIREMENTS

The C-17 is being designed to be very reliable and maintainable, which could result in its needing about 5,100 fewer personnel than the C-5. An additional 7,800 fewer personnel would be required under the C-17 alternative by virtue of the lower number of C-130s to be maintained in the inventory. In an era of rigid personnel ceilings and critical skill shortages, the significance of the C-17's potentially lower personnel requirements should not be overlooked.

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As you requested, Mr. Chairman, we took a hard look at the assumptions used by the Air Force in its analysis which concluded that the C-17 was the most cost-effective alternative. It was no surprise that a major analysis of this sort involved literally dozens of key assumptions. However, little or no consensus exists between the C-5 and C-17 supporters on the specific details of many of those assumptions as well as their significance. In many cases, each side can provide rather convincing arguments, including at least some supportable data, for their position or against the other side's position. Some of the key areas of contention which played a critical role in the Air Force's analysis and subsequent decision are:

- the military significance of direct deliveries to forward operating locations and whether the C-5 and C-17 can routinely and safely be used to do that;
- the average payload and surge utilization rate for the C-5 and C-17 which, in turn, affect the quantity of aircraft needed;
- the capability of the C-17 to perform intratheater shuttle missions without a major degradation to its intertheater capabilities;

- the need to gradually phase down the use of the C-141 and to eventually retire the entire fleet rather than further extend their service lives;
- the ability of the C-17 (but not the C-5) to perform the workload of C-130s to be retired without replacement; and
- the appropriate acquisition as well as annual operating and support costs for both the C-5 and C-17.

Few, if any, of these issues will become any less debatable in the near future and the decision to proceed with the C-17 or the C-5 will probably continue to be controversial because of:

- the lack of actual data on what the C-17 can and cannot do;
- the difference between what the C-5 was designed to do and what it has been used for;
- the number and variety of potential operational scenarios involved; and

-- the disappearance of a clear distinction between intertheater and intratheater airlift missions and aircraft.

However, we believe the Air Force made a reasonable decision to proceed with the C-17 because, if the C-17 comes close to its cost and performance projections, it should:

- provide greater operational flexibility and facilitate the implementation of the direct delivery concept;
- result in lower life-cycle costs; and
- require fewer personnel to operate and support.

The C-17 is a costly program and certainly one which deserves continuing oversight. However, we believe that the cost-effectiveness of the C-17 has been sufficiently demonstrated by the Air Force. The challenge still ahead of the Air Force is to demonstrate that the C-17 program can meet its cost, schedule, and performance objectives.

Mr. Chairman, this concludes my prepared statement. I will be pleased to respond to any questions that you or other members of the Committee might have.