MASAD 114832

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

MISSION ANALYSIS AND
SYSTEMS ACQUISITION DIVISION

APRIL 6, 1981

B-200766

The Honorable Caspar W. Weinberger
The Secretary of Defense

Attention: Assistant for Audit Reports

Dear Mr. Secretary:

Subject: Major Issues Concerning the C-X Range and Payload Remain Unresolved (MASAD-81-24)

Our review of the C-X aircraft program addressed major issues, including the aircraft's limited range and load carrying capabilities. We summarized these issues in a letter to the Secretary of Defense, dated October 10, 1980, which recommended that the Air Force delay issuing requests for proposals to industry for the aircraft's full-scale engineering development until these issues were resolved. The Principal Deputy to the Under Secretary of Defense, Research and Engineering (USD/R&E) did not fully agree with our assessment of the C-X. He stated that the minimum acceptable range and load carrying capabilities of the C-X are adequate to meet the intertheater airlift requirements. As a result, on October 15, 1980, the Air Force requested proposals from industry for C-X full-scale development. Our October 10, 1980, letter and the USD/R&E response are included as enclosures I and II, respectively.

The Air Force has now begun to evaluate proposals received from three major contractors and plans to award a development contract for the C-X in July 1981 if the program is approved by the Defense Systems Acquisition Review Council and if congressional funding is authorized. Full-scale production of the C-X could begin about October 1986, with an initial operational capability scheduled for September 1987. The Air Force estimates that the program could include about 200 aircraft at a cost of $10 to $11 billion (fiscal year 1980 dollars) for development and production.

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We believe that the C-X range and payload issues discussed in our October 10, 1980, letter warrant further consideration, especially the range and payload requirements for the C-X. We still believe that the Air Force is specifying a C-X design which is sacrificing the aircraft's primary mission of intertheater airlift to achieve a greater capability to operate within a theater on small, austere airfields (intratheater).

The Air Force requested contractors to propose an aircraft designed to meet or exceed certain minimum performance specifications and which could best complete the airlift requirements of four airlift scenarios described in the requests for proposals. Air Force officials believe this approach will provide the best aircraft design to meet the intertheater airlift mission. However, because three of the four scenarios emphasize the capability to operate on small, austere airfields, we believe the C-X design envisioned by the Air Force may not provide the optimum solution to meeting the primary requirement of intertheater airlift as stated in the C-X Mission Element Need Statement (MENS). Accordingly, we are providing a summary of our initial conclusions concerning the range and payload of the C-X, the USD/R&E's response to these conclusions, and our observations on other C-X performance issues.

C-X HAS LIMITED INTERTHEATER RANGE AND PAYLOAD CAPABILITIES

We concluded in our October 10, 1980, letter that the minimum specified range and payload of the C-X may be inadequate unless substantial refueling is provided at intermediate land bases or by aerial refueling. Also, we noted that there is a question as to whether sufficient land-based or aerial refueling will be available to meet C-X requirements.

USD/R&E response

The reply to our letter stated:

> "The C-X with full payload will need aerial refueling or intermediate stops to reach NATO [North Atlantic Treaty Organization], Korea, or the Persian Gulf with maximum payload, as do the C-5 and C-141. * * * It is important to realize that only a very large aircraft would be completely free of the need for aerial refueling or enroute basing when carrying its maximum allowable payload. * * * It is important to note that roughly only 10 percent of the missions flown will carry the maximum payload. The average payload is closer to 70 percent of maximum because of typical load volume/densities. * * *"

Our additional observations

We agree that intertheater airlift aircraft would require about the same number of refueling stops or aerial refuelings as the C-X to reach a NATO, Persian Gulf, or Korean conflict with maximum load. However, the maximum load of a large intertheater aircraft would be about twice as much as the maximum load of a C-X designed with the minimum performance specifications established by the Air Force. Further, a larger aircraft could trade off part of its cargo for more fuel and achieve a much greater range than the C-X, while still carrying more cargo than the C-X with its maximum load. For example, a larger aircraft could carry about 180,000 pounds of payload unrefueled from the Eastern United States to central Germany. This could include an M-1 tank and about 50,000 to 60,000 pounds of additional cargo. The C-X, however, could not travel the same distance unrefueled unless its cargo was reduced to about 80,000 to 90,000 pounds, or about one-half that of the larger aircraft. Because M-1 and M-60 battle tanks weigh more than 90,000 pounds, the C-X could not carry this equipment to central Germany without refueling.

The USD/R&E stated that only about 10 percent of the C-X sorties would carry a maximum load and the C-X with its average payload (70 percent of maximum) would have adequate range to reach critical refueling bases enroute to the Persian Gulf or other scenarios. However, equipment which comprises a C-X maximum load, such as battle tanks, are essential to the war effort, and the C-X's ability to move this equipment to the battle area quickly could be crucial. In most scenarios, the limited range of the C-X with full payload, or even with 70 percent of full payload, would require one or more refueling stops which in turn would increase the delivery time. As discussed above, a larger aircraft designed more optimally for the intertheater mission could achieve much greater range than a C-X while carrying a greater payload. The larger aircraft would, therefore, require fewer refueling stops and could deliver more cargo to the battle area in less time--an advantage which is critical to support the rapid mobility concept.

The USD/R&E did not respond to our concern that land-based or aerial refueling may not be available to the extent required by the C-X. Throughout the past decade, the number of major overseas Air Force installations has steadily decreased, while use of the remaining bases has become subject to more stringent host nation conditions. As discussed in our October 10, 1980, letter, the United States could not obtain diplomatic clearance to use bases in European and Mediterranean area countries during the 1973 Middle East war and on more recent occasions. Because U.S. access to these bases has been denied in the past, we believe the future availability of these locations to support a Persian Gulf contingency is questionable.

If access to critical intermediate land bases were denied, the C-X could not travel to the Persian Gulf without extensive

aerial refueling. In view of Air Force studies which indicate tanker aerial refueling assets are already inadequate in some contingencies, the U.S. tanker resources may not be able to support the increased demand for aerial refueling for C-X aircraft.

FUTURE CAPABILITY OF C-X TO CARRY THE M-1 TANK IS STILL UNCERTAIN

In our October 10, 1980, letter, we stated the potential future weight growth of the Army's M-1 main battle tank may make it too heavy to be carried on the C-X aircraft. This conclusion was based on data provided by the Army which indicated that a number of proposed M-1 modifications could increase the tank's weight to over 130,000 pounds.

USD/R&E response

The reply to our letter stated that:

> "The * * * load (130,000 lbs.) of the C-X was established in coordination with the U.S. Army to accommodate the M-1 tank. The M-1 currently weighs 120,800 lbs. (combat loaded). Future improvements being considered could increase its weight to 129,000 lbs. combat configuration if all improvements are approved. At this time only the addition of the 120 mm gun has been approved. Each product improvement program and the associated weight increase is being coordinated with the Air Force."

Our additional observations

The Army's recent reevaluation of the M-1's potential weight growth places the tank's maximum weight at 129,000 pounds (combat loaded) if all product improvements are implemented. Although this weight is within the C-X maximum payload, it allows only 1,000 pounds weight growth for future modifications to meet changing threats or to correct deficiencies. This is a small margin to assure that the C-X will retain its capability to carry the M-1 through the 1990s and beyond.

An Army official said they are now considering a plan which would cancel several proposed modifications and would limit the tank's maximum weight to about 126,000 pounds. This plan, if approved, would provide a 3-percent margin for future weight growth. Army officials also said they could reduce the tank's weight about 7,000 pounds by unloading its fuel, ammunition, and machine guns, although they prefer the tank to be combat ready when delivered to the contingency area.

OTHER OBSERVATIONS

In addition to the information discussed above and in our October 10, 1980, letter, we believe the following additional observations regarding C-X performance capabilities should be considered.

Although the Air Force has emphasized the need for an aircraft which can operate on airfields with short, narrow runways, a larger intertheater aircraft could also have some capability on small, austere airfields, such as the 4,000 feet specified for the C-X with maximum payload. Further, recent C-5 operational utility evaluation tests indicate that a large intertheater aircraft could taxi or unload cargo on unprepared surfaces, including sand, clay, and silt. A large aircraft, therefore, could taxi and park off prepared surfaces that had been surveyed and approved for these operations in advance and would not necessarily be precluded from using an austere airfield.

We also observed that while the C-X has been reported as needing the capability to operate on semiprepared surfaces such as sand or gravel, the model contract in the request for proposal did not require the contractor to test or demonstrate C-X capabilities on other than paved surfaces. The Air Force has stated that this capability is critical because over one-half the runways in the Persian Gulf area and many runways in other parts of the world are unpaved. Without actual contractor testing or demonstration, however, there is no assurance the C-X will be able to meet its minimum landing and takeoff performance specifications on semiprepared surfaces. On February 20, 1981, after discussing this matter with Air Force officials, the Deputy for Airlift and Trainer Systems said the model contract would be modified to require contractor testing of the C-X on semiprepared surfaces.

CONCLUSIONS AND RECOMMENDATIONS

Although the Air Force has emphasized the importance of procuring a C-X aircraft with the ability to use small, austere airfields, the C-X MENS states that "the feasibility of requiring this capability will depend upon the extent of its penalty to the primary mission, which is intertheater airlift." We believe the minimum range and payload specified for the C-X, while providing a small, austere airfield capability, may penalize the aircraft's primary mission of intertheater airlift.

We recommend that you reassess the range and payload issues discussed above and in our October 10, 1980, letter to determine if the C-X aircraft being considered by the Air Force provides the capability to fill the mission need as stated in the C-X MENS. Also, should you determine that a smaller aircraft is not appropriate, the proposal evaluation currently underway

should be terminated and requests for proposals reissued on the basis of your reassessment.

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

This report contains recommendations to you on page 5. As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We would appreciate receiving a copy of your statement when it is provided to the congressional committees.

Sincerely yours,

W. H. Sheley, Jr.
Director

Enclosures - 2

ENCLOSURE I

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

PROCUREMENT AND SYSTEMS
ACQUISITION DIVISION

October 10, 1980

B-200766

The Honorable Harold Brown
The Secretary of Defense

Attention: Assistant for Audit Reports

Dear Mr. Secretary:

Subject: The Department of Defense Should Resolve Certain Issues Concerning the C-X Aircraft Before Requesting Proposals From Industry for Its Full-Scale Engineering Development (PSAD-81-8)

Our review of the C-X aircraft program addressed major issues concerning the aircraft's range and its load carrying capability. In addition, Defense has not yet completed its strategic mobility requirements study as directed by the House and Senate Authorization Act for fiscal year 1981 nor has a Mission Element Need Statement (MENS) been approved. Nevertheless, the Air Force plans to solicit formal design and cost proposals from potential contractors in the immediate future for the full-scale engineering development of the C-X aircraft. We believe such action before these matters are resolved is both premature and contrary to the sound acquisition management principles of Office of Management and Budget Circular A-109.

BACKGROUND

In November 1979 the Air Force formed a task force with Army and Marine Corps participation to define future airlift requirements for the worldwide deployment of U.S. forces. The task force analysis revealed significant shortfalls in the capability of the United States to provide long-range intertheater airlift to meet worldwide rapid mobility requirements. In addition, the task force recognized that the United States does not currently have the capability to airlift large outsize cargo, such as the Army's XM-1 main battle tank and infantry fighting vehicles, within a theater (intratheater).

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The task force recommended the acquisition of an airlift aircraft with adequate size and range to carry outsize cargo intertheater and also with the capability to land at small austere airfields. The small austere airfield landing capability would reduce potential aircraft saturation at larger airfields and would allow the aircraft to be used in an intratheater role.

To meet these requirements the Air Force has proposed the C-X, an aircraft which can carry larger loads than the C-141 but about half as much as the C-5. Full-scale production of the C-X could begin about October 1986 with an initial operational capability in September 1987. The Air Force estimates that a procurement of 200 C-X aircraft could cost about $10 billion to $11 billion (fiscal year 1980 dollars) for development and production.

The Air Force is planning to issue requests for proposals (RFPs) to potential contractors for the full-scale engineering development of the C-X aircraft. If the RFPs are issued in October 1980 as planned, source selection could begin in January 1981.

C-X RANGE AND LOAD CAPACITY MAY BE INADEQUATE

The current design range of the C-X may be inadequate unless substantial refueling is provided at intermediate land bases or by aerial refueling. In addition, proposed modifications to the Army's XM-1 main battle tank could increase its total combat weight to over 130,000 pounds, the C-X's maximum load capacity.

Current C-X design range may be inadequate

In certain contingencies, the range of the C-X may not be adequate to reach its destination without refueling. There is some question, however, as to whether sufficient aerial or land-based refueling will be available to meet C-X requirements. In a Persian Gulf conflict, for example, the most likely route for the C-X would be from the Eastern United States to Lajes Air Base in the Azores; then to Cairo, Egypt; and then to Dhahran, Saudi Arabia. The distances involved are 2,295, 3,155, and 1,170 nautical miles, respectively. With a design range of 2,400 nautical miles while carrying a maximum load, the C-X could not travel from Lajes to Cairo without refueling. If the C-X carried only 75 percent of its maximum load (97,500 pounds), its

range would be increased to 3,200 miles and refueling may not be necessary. However, both the XM-1 and the M-60 main battle tanks exceed 75 percent of the C-X's maximum load. Therefore, the C-X could not carry these tanks that distance without refueling.

Although the Air Force plans to equip the C-X for aerial refueling, Air Force studies indicate the tanker capability of the United States may already be inadequate for some contingencies involving both strategic and tactical forces. With the addition of the C-X to the airlift force, there will be an even greater demand on limited tanker resources. Therefore, adequate aerial refueling may not always be available to the extent required by the C-X.

The C-X could rely on alternate land-based refueling stops in Europe or the Mediterranean to carry its maximum load to the Persian Gulf area. In the 1973 Middle East war, however, the United States could not obtain diplomatic clearance to use bases which the United States normally used in the United Kingdom, Spain, Italy, Greece, and Turkey. Also in 1973, the aircraft had to avoid flying over land masses and stay out of airspace controlled by Arab countries. With the growing political and economic influence of third world countries, the availability of en route refueling locations in the future may be denied, as was the case during recent attempts by the United States to deploy fighters to Egypt and to deliver F-16s to Israel.

In contingencies other than the Persian Gulf, the C-X would also require refueling. For example, in a European conflict the C-X could not travel from the Eastern United States to central Germany without either aerial refueling or one land-based refueling stop. In a Korean conflict, the C-X with maximum load would require three land-based refueling stops, or a combination of aerial refueling and land-based stops.

An alternate airlift plan could employ the C-5 to carry XM-1 and M-60 tanks while the C-X carried lighter cargo to extend its range. Although this would be possible, it might also create additional intratheater airlift requirements because the C-5 cannot land at the small austere airfields that are planned for C-X operations. Therefore, the tanks would have to be moved intratheater with the C-X from the large C-5 airfields to the battle area. C-X aircraft tasked for this purpose would then be unavailable for intertheater airlift purposes. Also, this tactic would increase aircraft

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traffic at the large airfields and contribute to airfield saturation.

C-X maximum load capacity may be inadequate to carry the XM-1 tank

The potential future weight growth of the Army's XM-1 main battle tank may make it too heavy to be carried on the C-X. The XM-1 currently weighs about 120,000 pounds, including fuel and ammunition. The Army has approved modifications to the tank, including the addition of the 120-mm. gun which will increase its combat weight to about 123,000 pounds and has proposed other modifications which could increase the tank's weight to a maximum of 134,200 pounds. This weight would exceed the maximum load capacity of the C-X by 4,200 pounds.

The XM-1's weight could be reduced about 7,000 pounds by unloading its fuel, ammunition, and machine guns. Although this would reduce the tank's weight below 130,000 pounds, we were told that the Army prefers the tanks to be combat ready when delivered to small austere airfield locations. We were also told that future modifications may become necessary to meet changing threats or to correct deficiencies and that these modifications could increase the tank's weight to over 130,000 pounds even without fuel and ammunition.

DEFENSE MOBILITY STUDY MAY AFFECT C-X DESIGN

Although Defense has not yet completed a study of the mobility requirements which could affect the design of the C-X aircraft, the Air Force is continuing with its plans to issue RFPs to potential contractors for its full-scale engineering development. As you know, the House and Senate Committees' Authorization Act for fiscal year 1981 has directed Defense to conduct a comprehensive study of the mobility requirements for United States military forces. Although the committees believe there is a need for additional strategic airlift capability, it is uncertain as to whether the C-X concept proposed by the Air Force is the best way to provide this added capability.

Defense's mobility study is intended not only to determine total airlift requirements, but also to form the basis for the design of suitable new aircraft or derivatives of existing aircraft, to meet the requirement. Although the results of this study will not be reported to the committees

until February 1981, the Air Force plans to issue RFPs about October 15, 1980.

By issuing RFPs several months before the mobility study is completed, the Air Force may be requesting an aircraft design that is not fully compatible with the needs indicated by the study results. This would require the Air Force to revise and reissue RFPs and solicit new proposals from the contractors. This effort could cost the contractors several million dollars which would be shared in part by the U.S. Government through the allocation of overhead to Government contracts.

A C-X MENS SHOULD BE APPROVED

We are also concerned that the Air Force apparently plans to release C-X RFPs prior to the Secretary of Defense's approving a MENS. Although we were unable to obtain the Office of the Secretary of Defense's informal comments on the draft MENS, we understand some controversy exists within Defense over the cost effectiveness of procuring a C-X with both intertheater and intratheater capabilities. Because this issue could have a significant impact on the design and cost of the aircraft, we believe that the Air Force should not issue RFPs until a C-X concept has been agreed upon and a MENS is approved.

CONCLUSIONS AND RECOMMENDATIONS

The Air Force is planning to request cost and design proposals from potential contractors for the full-scale engineering development of an aircraft which may not have the range or load carrying capacity to meet mission requirements. In addition, because Defense has not completed its mobility requirements study and the C-X MENS has not been approved, the Air Force may be requesting an aircraft design that is not compatible with the mobility study results or the concept as agreed upon by the Office of the Secretary of Defense and stated in the MENS.

We recommend that you direct the Secretary of the Air Force to delay issuing C-X RFPs or proceeding further with the C-X program until the Air Force resolves the aircraft's range and load limitations and until the mobility requirements study is completed and a MENS is approved. We believe these actions would provide sound management to an acquisition program that currently contains uncertainties and

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could undergo substantial changes when these uncertainties are resolved.

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

This report contains recommendations to you on page 5. As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement of actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agencies first request for appropriations made more than 60 days after the date of the report. We would appreciate receiving a copy of your statement when it is provided to the congressional committees.

Sincerely yours,

W. H. Sheley, Jr.
Acting Director

ENCLOSURE II

THE UNDER SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301

RESEARCH AND
ENGINEERING

30 DEC 1980

Honorable Elmer B. Staats
Comptroller General of the United States
Washington, DC 20548

Dear Mr. Staats:

This is in reply to your letter report of October 10, 1980 to the Secretary of Defense, concerning "The Department of Defense Should Resolve Certain Issues Concerning the C-X Aircraft Before Requesting Proposals from Industry for Its Full-Scale Engineering Development" (PSAD-81-8) (OSD Case #5605-A).

The Department of Defense has reviewed the issues presented in the report and the recommendation to delay issuing the C-X Request for Proposal (RFP). The GAO recommendation was based on three factors: (1) A potential range or load carrying capacity problem associated with the requirements as specified in the C-X RFP; (2) the Congressionally Mandated Mobility Study (CMMS) had not been completed; and (3) a Mission Element Need Statement (MENS) had not been approved. A point-by-point response to specific comments in the report is enclosed. The following summarizes the specific responses:

1) There is no range or load limitation problem associated with the minimum acceptable requirements. The C-X RFP is consistent with the critical legs and average loads associated with the scenarios and requirements of the CMMS. It provides for an airlift capability to complement our existing airlift force.

2) The CMMS data bases, scenarios and types and mixes of cargo requiring lift provide the basis for definition or design of suitable aircraft as well as other mobility elements to provide a balanced solution to lift requirements. Factors in the CMMS which would impact aircraft design have been firmly established and approved. The scenarios and data used in the RFP are consistent with the CMMS data bases. Therefore, there is no need to wait for completion of the study.

3) The C-X RFP was released after consideration of your recommendation because of the urgent requirement for augmentation of our intertheater airlift and because all factors that drive aircraft design have been sufficiently well defined to allow their use in the RFP. There was no need to delay further the program since outstanding MENS issues were unrelated to the RFP. The MENS was subsequently approved and signed on November 28, 1980.

Gerald P. Dinneen

Attachment

Gerald P. Dinneen
Principal Deputy

ENCLOSURE II

DEPARTMENT OF DEFENSE COMMENTS
on
GAO LETTER REPORT DATED OCTOBER 10, 1980

"The Department of Defense Should Resolve Certain Issues Concerning the C-X Aircraft Before Requesting Proposals From Industry for Its Full-Scale Engineering Development"

COMMENT: C-X range and load capacity may be inadequate.

"The current design range of the C-X may be inadequate unless substantial refueling is provided..."

"...proposed modifications to the Army's XM-1 Main Battle Tank could increase its total combat weight to over 130,000 pounds..."

RESPONSE: There is no specified design range for the C-X. Ranges specified in the RFP are in terms of minimum acceptable refueled and unrefueled mission requirements. The C-X with full payload will need aerial refueling or intermediate stops to reach NATO, Korea, or the Persian Gulf with maximum payload, as do the C-5 and C-141. The C-X, however, will be able to carry its maximum payload further than either the C-5 or C-141. It is important to realize that only a very large aircraft would be completely free of the need for aerial refueling or enroute basing when carrying its maximum allowable payload. (Neither the C-5 nor the KC-10 can carry 120,000 lbs. to the Middle East without refueling.) Moderate increases in C-X range would not significantly alter its need for bases or aerial refueling in most scenarios of interest. It is important to note that roughly only 10 percent of the missions flown will carry the maximum payload. The average payload is closer to 70 percent of maximum because of typical load volume/densities. An aircraft designed to be an efficient carrier of maximum payloads would be an inefficient carrier of average payloads.

The C-X will be able to carry a minimum of 130,000 lbs. (three infantry fighting vehicles or one XM-1 tank). The maximum projected weight of the XM-1 Main Battle Tank is below 130,000 lbs. The XM-1 currently in low rate initial production weighs 120,800 lbs. with full fuel tanks, ammunition, and crew on board (combat loaded). Future improvements being considered could increase its weight to 129,000 lbs. combat configuration if all improvements are approved. The air transportability of the XM-1 and all Army equipment was considered when the 130,000 lb. allowable cabin load requirement was established. Even if the combat loaded XM-1 were to exceed 130,000 lbs., it could still be carried in a non-combat configuration.

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COMMENT: Current C-X design range may be inadequate.

"In certain contingencies, the range of the C-X may not be adequate to reach its destination without refueling."

"There is some question, however, as to whether sufficient aerial or land-based refueling will be available to meet C-X requirements."

RESPONSE: The C-X will meet the Persian Gulf deployment critical leg distance of 3200 NM unrefueled carrying an average outsize payload of approximately 100,000 lbs. Only for those C-X sorties carrying tanks and a few similarly-sized pieces of equipment exceeding average payloads in contingencies where the longest route segment exceeds 2400 NM will air refueling be required. These sorties would typically amount to less than 10 percent of the total number of sorties. Tanker resources would only be required when such loads were allocated to the C-X.

The C-X key contingency range/payload criteria specified in the RFP will provide an efficient peacetime range of over 3600 NM with an average payload of 65,000 to 75,000 lbs. This range/payload relationship provides significant flexibility and capability for contingencies. If maximum range capability were required with maximum payload, the aircraft would be much larger and significantly less efficient with average payloads. It should again be stressed that these range/payload values are the minimum acceptable.

COMMENT: C-X maximum load capacity may be inadequate to carry the XM-1 tank.

"The potential future weight growth of the Army's XM-1 Main Battle Tank may make it too heavy to be carried on the C-X"

RESPONSE: The minimum allowable cabin load (130,000 lbs.) of the C-X was established in coordination with the U.S. Army to accommodate the XM-1 tank. The XM-1 currently weighs 120,800 lbs. (combat loaded). Future improvements being considered could increase its weight to 129,000 lbs. combat configuration if all improvements are approved. At this time only the addition of the 120 mm gun has been approved. Each product improvement program and the associated weight increase is being coordinated with the Air Force.

COMMENT: Defense Mobility Study may affect C-X design.

"Although Defense has not yet completed a study of the mobility requirements which could affect the design of the C-X aircraft..."

"It is uncertain whether the C-X concept proposed by the Air Force is the best way to provide this added capability."

"Defense's Mobility Study is intended not only to determine total airlift requirements, but also to form the basis for the design of suitable new aircraft or derivatives of existing aircraft, to meet the requirement."

RESPONSE: The CMMS data bases, scenarios and types and mixes of cargo requiring lift, provide the basis for definition or design of suitable aircraft as well as other mobility elements to provide a balanced solution to lift requirements. Factors in the CMMS which impact aircraft design have been firmly established and approved. The scenarios and data used in the RFP are consistent with the Mobility Study. Therefore, contractors will be proposing solutions that they feel best satisfies the mission requirements as expressed by the scenarios and their lift requirements. The use of representative mission statements/scenarios as the basis for determining design solutions that best integrate the C-X with out rotal airlift force provide the contractor the maximum design/proposal freedom and the Government the greatest choice in selecting the C-X aircraft.

Only in the event that the approved scenarios and/or the composition of the forces required to respond to these scenarios should change in such a way as to greatly affect the route structure or payload mix, is it conceivable that contractor proposals would not be compatible with requirements. All likely worldwide contingency areas have been considered along with current and projected force structures. We see no basis for change, and there is therefore no need to wait for completion of the study.

COMMENT: A C-X MENS should be approved.

"...we understand some controversy exists within Defense over the cost effectiveness of procuring a C-X with both intertheater and intratheater capability."

RESPONSE: One of the reasons that it was deemed necessary to release the RFP was to ascertain the costs associated with both new designs as well as proposals of existing aircraft and derivatives of existing aircraft. The desirability of operating the C-X into small, austere airfields is not an issue and does not preclude other than new aircraft from being responsive to the RFP. Responses to the RFP will provide necessary information to enable the cost effectiveness of this feature to be evaluated.

ENCLOSURE II

COMMENT: Conclusions and Recommendations.

"We recommend that you direct the Secretary of the Air Force to delay issuing C-X RFPs or proceeding further with the C-X program until the Air Force resolves the aircraft's range and load limitations and until the Mobility Requirements Study is completed and a MENS approved."

RESPONSE: There is no range or load limitation problem associated with minimum requirements expressed in the RFP. They are consistent with the critical legs and average loads associated with the scenarios and requirements of the CMMS and provide a balance for efficient peacetime operation while complementing our existing airlift force. The data base for the CMMS has been approved and the RFP is consistent with this data base. Factors that drive aircraft design have been sufficiently well defined to allow their use in the RFP. The MENS has been approved.