COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C.

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May 22, 1974

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Dear Mr. Chairman:

On April 3, 1974, we issued our current staff study to your committee on the Heavy Lift Helicopter (HLH) program. We pointed out that component testing problems were being experienced during the Advanced Technology Component (ATC) program which might adversely impact on the overall HLH program. We have continued to monitor the ATC development since issuing the staff study and we find that the anticipated problems have become reality. The purpose of this letter is to bring these most current matters to your attention while the authorization and appropriation deliberations are still in process.

The ATC program is a three year effort ending in June 1974. In June 1971, a contract was awarded to the Boeing Vertol Company to seek maximum reduction of technical risks and costs associated with the engineering development of an HLH system through the design, fabrication, demonstration, and test of selected critical HLH components. The objectives of the ATC program are to:

--Demonstrate component technology to reduce development risks applicable to a 22.5-ton payload HLH at the lowest total HLH system cost.

--Secure a cost data base adequate to assure that cost estimates developed from that data base are credible and acceptable.

--Provide the services with improved technology and reduced risk for program definition for large payload helicopters.

--Advance the level of industry expertise in HLH components.

The original schedule required all component testing to be completed by May 31, 1974, with the final [illegible] for [illegible] purposes. In January 1973, the [illegible] was modified to include an [illegible] flying prototype. The prototype development schedule was based on the ATC schedule.

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For [illegible], [illegible] the [illegible]/Drive components was [illegible] [illegible] [illegible] of these components [illegible] [illegible] was [illegible] [illegible] in a realistic flight environment. The total contract target cost amounted to $1[illegible].9 million as of [illegible] 1974.

As reported in the staff study, the Air Mobility Research and Development Laboratory ([illegible]) has the responsibility for monitoring and [illegible] technical risk [illegible] on the A[illegible] program. The overall technical status of the [illegible] and prototype aircraft efforts has been an area of increasing concern to AMRDL personnel and as a result, has been the subject of numerous meetings between personnel in AMRDL and the [illegible] Project Manager's Office. [illegible] visited AMRDL on March [illegible], 1974, and found that an early March 1974 technical assessment by AMRDL disclosed that problems had reached a point where the Government should consider re-direction of the ATC and prototype efforts. Based on this preliminary assessment and subsequent meetings between the Project Manager and Director of AMRDL, the Project Manager indicated he was proposing a reorientation/restructuring of the program, generally as follows:

--restructure the ongoing R&D efforts in order to place more emphasis on the prototype aircraft and remove the emphasis on advanced technology demonstration,

--terminate the ATC effort this summer, prior to the Army Systems Acquisition Review Council in July 1974, even if all of the detailed technical objectives of the effort have not been [illegible], recognizing that there will most likely be areas where further redesign/revalidation of components will be required, and

--consider the desirability to make trade-offs of some of the original performance goals, although there is no intent to lower any of the [illegible] design goals at this time.

To assist in the restructuring effort, AMRDL conducted a technical assessment of the ATC and prototype aircraft [illegible] as of April 15, 1974, and provided the Project Manager with the following summary comments.

The [illegible] [illegible] [illegible] ATC projects are [illegible] [illegible] [illegible], have not [illegible] [illegible] [illegible] [illegible] and drive [illegible] [illegible] [illegible] [illegible] [illegible], severe failures [illegible] [illegible], with the overall progress of the program [illegible] behind schedule. To date, many of the

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[illegible] ATC [illegible] have not been [illegible] [illegible] of [illegible] [illegible] presently defined by the [illegible] by [illegible] 1974.

The [illegible] shows that substantial ATC schedule overages will occur, [illegible] below. [illegible] does not restructure the ATC and [illegible] efforts.

--All ATC testing on the rotor blades cannot be completed before December 1974.

--Endurance testing of the elastomeric bearing will be completed in late July 1974.

--Due to [illegible] redesign of some ATC components (e.g., pitch housing [illegible] by the [illegible] crossbeam [illegible] only) for the prototype aircraft, it will be necessary to conduct safety of flight verification testing on the redesigned components in the prototype program.

--The 200 hour Aft and Combiner Transmission Bench Test cannot be completed before September 1974.

--The [illegible] hour Dynamic System Test Rig (DSTR) program is scheduled to start [illegible] and end August 31, 1974. Since existing rotor system components which will be used in the DSTR will undergo appreciable redesign for the prototype aircraft, [illegible] believes DSTR testing in the ATC effort should be reduced to 75/50 hours. The remaining test time would be conducted with prototype components on either the DSTR or a tie-down aircraft in the prototype program.

--The ATC problems have for the most part been engineering type problems as opposed to being problems related to technology.

[illegible] the titanium hub components. [illegible] initiators [illegible] If these are not successful [illegible] corrective [illegible] will [illegible] requiring on the order of [illegible] for completion.

In recognition of the potential [illegible] of these technical findings, the [illegible] ad-hoc review team to study [illegible]

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--The [illegible] of increased [illegible] development [illegible] that [illegible] can be mini- [illegible] problem areas identified to be accomplished during the prototype design validation [illegible] that the subject [illegible] technical risk in the narrow context of [illegible] program. In the broader view, or in a relative sense, the ATC program has significantly reduced program risk as a result of the ATC efforts identifying problem areas and solution prior to prototype drawing release. Therefore, in a relative sense, the risk is much lower than it would have been if the prototype program was [illegible] from a paper design, without the benefit of the ATC effort.

--The subject assessment identified a number of fretting problems in the AIC rotor hub components. These problems are almost exclusively limited to titanium components and vary in degree of severity. The review team considers titanium fretting to be a major development problem which will require a concentrated contractor effort to develop solutions. However, such problems are not unusual in new aircraft development programs.

As shown above, the present phasing between the ATC and prototype aircraft efforts is also of technical concern to [illegible] personnel. The April assessment noted that due to [illegible] in the ATC effort the fabrication of many of the prototype components (Rotor/Drive) are being initiated in advance of adequately determining final component design through testing in the ATC effort.

On April [illegible], 1974, the [illegible] Deputy Project Manager stated that the details for the [illegible] of the ATC effort would not be completed until [illegible] May 1974. These details will include the cost impact of restructuring the [illegible] program.

In view of the current situation relating to the ATC program and the associated cost [illegible] you [illegible] may wish to discuss these [illegible] with the Army and Office of the Secretary of Defense [illegible]:

--Whether all of the ATC program objectives have been accomplished.

--If the ATC program is restructured, what [illegible] will the Army take to [illegible] to minimum and to accomplish all of the [illegible].



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--What the [illegible] restructuring of the [illegible].

--What the [illegible] to award a contract for [illegible] the program is restructured.

--When the Army decided it [illegible] prototype and what its justification was at that time.

--What the expected cost, schedule and performance impact will be on the overall MLM program.

A draft of this letter was discussed with Army officials involved in the management of the MLM and their comments have been incorporated as appropriate. We plan to continue monitoring the MLM program and will keep you advised of further development.

This letter is also being sent to the Chairman of the Senate and House Armed Services Committees, Chairman of the Senate Appropriations Committee, and the Secretaries of Defense and Army.

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Sincerely yours,

R.F.KELLER

Acting Comptroller General
of the United States

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