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WASHINGTON, D.C. 20548

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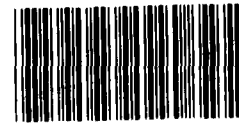
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B-201273

27 JUN 1983

RELEASED

The Honorable Ted Stevens
Chairman, Subcommittee on Defense
Committee on Appropriations
United States Senate



121957

Dear Mr. Chairman:

Subject: Progress Made by AH-64 Helicopter Contractors in
Preparing for High Rate Production (NSIAD-83-4)

We have completed our review of the Army's AH-64 Apache helicopter program as requested in your letter of February 24, 1983. As agreed with your office, we concentrated our efforts on evaluating the ability of the prime contractors, Hughes Helicopters, Incorporated; and Martin Marietta Corporation; and their key subcontractors, to meet production deliveries for the fiscal year 1984 buy. Although some problems are being experienced in the early stages of the first low-rate production run, there is nothing to indicate that the planned buildup in the production rate, from the 7 per month required by the fiscal year 1983 contract to 11 per month for the fiscal year 1984 buy, cannot be achieved. Technical performance uncertainties present earlier in the Apache program have largely diminished.

In making our review, we analyzed recent test results and preproduction planning documents, cost and performance reports, and program progress reports prepared by the contractors. We interviewed responsible officials of the Army's Apache program management office, Defense Contract Audit Agency, Army Materiel Systems Analysis Activity, and Army plant representative's office at Hughes Helicopters, Incorporated. In addition to interviewing contractor officials at Hughes, Martin Marietta, and selected subcontractors, we visited their respective facilities where we observed ongoing production.

At each location we evaluated the contractors' production performance, status of technical problems that required resolution, and adequacy of production plans for the fiscal year 1984 buy. We believe the above are valid indications of the contractors' ability to meet the production rate requirements for the fiscal year 1984 buy. We did not reexamine logistic supportability in this review.

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Our review was made in accordance with generally accepted government auditing standards.

BACKGROUND

In our January 1983 report on the Apache program, we noted that a considerable effort on the part of the Army and the major contractors would be required in making the transition from development to production.¹ Development and testing had to be completed. Hughes was facing the formidable task of integrating its new production facilities, skilled labor, and management to permit efficient assembling and testing of sophisticated aircraft components produced by numerous suppliers.

The Army was aware of the magnitude of the task and the potential risk it posed to schedule and cost. It, therefore, added \$528 million to the Apache procurement estimate to allow for cost growth associated with the production risks. However, the Army has decided that the production risks are manageable and that it would be more appropriate to apply that money to the procurement of additional Apaches. The Army's fiscal year 1984 budget request for 112 Apaches, rather than the 96 previously planned, reflects this change in thinking.

The fiscal year 1984 buy will be the third production contract awarded to Hughes for Apache production. The following table reflects contract data regarding the first two contracts and the planned third-year contract.

<u>Date of contract</u>	<u>Quantity of Apaches</u>	<u>Maximum monthly delivery</u>	<u>Final delivery month</u>
Apr. 15, 1982	11	2	Sept. 1984
Mar. 31, 1983	48	7	July 1985
Planned	112	11	July 1986

¹The Army's AH-64 Helicopter and Hellfire Missile Retain Risks as They Enter Production (GAO/C-MASAD-83-9, Jan. 26, 1983).

Martin is producing the target acquisition designation sight and the pilot night vision sensor which the Army will supply to Hughes as government-furnished equipment.

PRODUCTION OUTLOOK AT HUGHES HELICOPTERS,
INCORPORATED, IS PROMISING

Hughes' production planning to meet the fiscal year 1984 buy's production rate appears adequate. Needs for additional machinery, staff, test equipment, and assembly fixtures for both Culver City and Mesa to support that buy have been identified and Hughes is proceeding to fill these needs. We believe Hughes' new management team is well qualified and aggressive. It possesses extensive experience gained from a variety of other production programs.

In our January 1983 report, we expressed concerns about Hughes' ability to build and staff a new production facility in Mesa, Arizona, in time to meet its production schedule and its ability to manage and coordinate the activities of numerous subcontractors. Hughes has made substantial progress in these areas as we noted on our visits to Culver City, California, and Mesa, Arizona.

At Mesa, Hughes successfully completed the Apache assembly plant in December 1982, 2 months ahead of schedule. Construction of the Mesa flight hangars, warehouse, and painting facility is on schedule. Production personnel with required skills are available in greater numbers than expected and Hughes has an overabundance of applications on hand to draw from for future staffing needs. The Mesa plant has a staff of about 500 people. Hughes plans to staff up to about 1,100 people by the end of 1983 and to 1,800 people by the end of 1984. These levels will be for one shift, working 8 hours a day and 5 days a week. We believe the staffing plan is achievable.

Hughes' production performance has been satisfactory thus far, although at the time of our visit to Mesa last month, the contractor was just getting into the early stages of assembling the final product. The first helicopter was in work station 3, as scheduled. There are 20 work stations in the Mesa assembly and test process. Hughes manages to its own internal schedule, which is 60 days ahead of the contractual schedule and, last month, was about 30 days behind its internal schedule in some parts fabrication. Some software for numeric controlled machines was also behind the internal schedule. Hughes has a recovery plan to regain its 60-day lead.

Surveillance over subcontractors

To provide appropriate surveillance over its major subcontracts, Hughes has assigned to each of its subcontract administrators, specific subcontractors that they are to monitor. The subcontract administrators are supported by a team consisting of employees drawn from other organizational departments such as engineering, manufacturing, and product support.

In addition, Hughes regional representatives visit subcontractors located within their region on a regular basis and communicate any problem detected to the appropriate subcontract administrator. Major subcontractors meet monthly with the prime contractor and with Army representatives to report on their production status and on any problems.

Resolution of technical difficulties

While at the time of our prior report some airframe components had not passed qualification tests, and the infrared suppressor, which reduces the Apache's heat signature, had not met specifications, subsequent test results have been favorable. Airframe component qualification tests are essentially complete. Engine and infrared suppressor flight tests were completed since we last reviewed the program and no major problems surfaced in the tests. The environmental control subsystem, about which we previously had some reservations, has been redesigned and successfully tested.

Financial capability

Hughes' financial position, underscored by the fact that the firm has committed nearly all of its available credit, is essentially unchanged since our January 1983 report. Defense Contract Audit Agency officials have continued to monitor Hughes' financial capabilities and, in March 1983, reported that the tight cash flow and credit picture were relatively unchanged from their previous reports. Hughes officials continue to contend that an increase in the company's line of credit is unnecessary. They maintain they are continuously monitoring their cash needs and that they have sufficient collateral to obtain an increase in their credit line should this become necessary. They point out that there are costs involved in securing a larger credit line which would not be reimbursable under the production contracts.

PRODUCTION AT MARTIN MARIETTA CORPORATION
IS SOMEWHAT BEHIND SCHEDULE

Although Martin Marietta appears to have reasonable plans for achieving the production rates anticipated in the fiscal year 1984 buy, it is encountering some difficulties with the first production units. In our January 1983 report, we noted that the change to correct a target acquisition designation sight problem involving a shifting boresight, and the performance of the microminiaturized version of this sight, had not been successfully demonstrated when the production decision was made and, therefore, posed some risk to the program. Design changes for both have now been successfully demonstrated in tests. However, in the course of testing these design changes, others were found necessary. Incorporating all the changes into the production design has put Martin behind schedule. The changes first caused delays in the manufacturing of hardware which, in turn, delayed proving out production line test stations. The latter then caused further schedule slippage because other more time-consuming methods of testing had to be used.

The first-year production contract calls for Martin to submit a first article test report by August 31, 1983, and to complete deliveries by the end of March 1984. Martin's revised schedule now shows that deliveries from the first contract will not be completed until the end of June 1984, while completion of first article testing has been delayed until May 1984. These delays pose risks to the extent that any modifications necessitated by disclosures in first article testing will have to be retrofitted on the units already delivered and incorporated into the production line. Martin officials, however, said they do not anticipate any significant amount of changes since the system has already been extensively tested. The Army has informed Hughes about Martin's revised delivery dates and Hughes indicated this will not affect its own ability to deliver on time. Martin's program director, however, indicated that meeting the revised schedule assumes successfully proving out the production line test stations and successfully completing the first article tests.

The engineering changes and schedule slippages are affecting Martin's ability somewhat to hold down costs. Target cost on its first production contract is \$116.8 million. This includes a \$5.7 million reserve for contingencies. As of March 1983, \$3.5 million of that reserve had been used. In May 1983,

Martin officials said they were evaluating the further effect on costs of recent schedule changes. It is too early to determine whether Martin will overrun the target cost on the first contract.

Martin's plans for future production are well in place. Planned personnel buildup appears reasonable and achievable. Production tooling and test equipment needs, to meet the production rate planned for the fiscal year 1984 buy, involve duplicating existing tools and equipment.

Martin had proposed the transfer of its production line for the target acquisition designation sight and its companion system, the pilot night vision sensor, by about mid-1984 from its existing facilities in Orlando, Florida, to a new plant being constructed in the same city. Martin planned to build enough targeting and night vision systems ahead of schedule to compensate for loss of production during the transfer. This plan is no longer feasible since Martin has fallen behind its production schedule. Martin now plans to continue the line in its present facility.

SUBCONTRACTORS ARE KEEPING PACE
WITH PRODUCTION SCHEDULES

Based on our review of production reports, we selected four key subcontractors for evaluation. Subcontractors, in their monthly reports to Hughes, measure their progress against delivery schedules containing delivery dates which are 1 to 2 months ahead of the delivery dates contained in their contracts with Hughes. At this time there is little indication that on the first two production contracts the four subcontractors will experience difficulty in meeting the dates for delivery to the prime contractor.

Based on our review of their current production and their production planning, all but one subcontractor appeared to be fully capable of achieving their planned production rates for the fiscal year 1984 buy. Recognizing the possibility that this subcontractor might have difficulty, Hughes is exploring alternatives for additional capacity for producing the subcontractor's component. The problem is not as serious as one where the contractor would have to contend with a highly complex manufacturing process. Rather, it involves managing production to accommodate competing programs which may tax the subcontractor's capacity to expand production to higher rates.

CONCLUSIONS

The Army and its contractors have made significant progress in reducing the development, testing, and production readiness risks in the Apache program, which we noted in our January 1983 report. The Army has continued to intensively monitor and manage the program, and the prime contractors and subcontractors have established experienced and dynamic management teams. Hughes' production preparations show foresight as demonstrated by the fact that the firm and its subcontractors have established internal schedules 30 to 60 days ahead of required delivery dates to allow time for reacting to, and correcting, problems which might otherwise jeopardize meeting the Army's delivery requirements.

Martin Marietta has largely overcome the technical problems associated with the target acquisition and designation sight. Current concerns are with the delay of the first article tests, and Martin's ability to catch up to its schedule and to control production costs. However, since design changes emanating from development testing during production were responsible for these delays, they are not necessarily an indictment of the contractor's production capabilities. Now that almost all the development work is out of the way, there is a reasonable basis for confidence that Martin can get back on schedule and meet the planned production rate for the fiscal year 1984 buy.

It should be noted that the Apache program is in the very early stages of production, Hughes having yet to produce the first aircraft. Although the complexities of production will not be fully understood until more production experience is gained, we believe that the Army and its contractors at this point are doing all that is possible to plan and gear up for achieving the higher production rates anticipated in the future. There is nothing to indicate that the planned production rates for the fiscal year 1984 buy cannot be achieved.

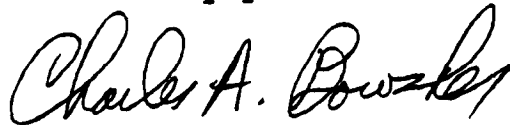
Although we did not request official agency comments, we discussed the contents of this report with the Department of the Army, Hughes, and Martin officials. They agreed with our conclusions and their views have been considered in the preparation of this report. In addition, the Under Secretary of the Army, to whom we furnished a draft of the report, submitted a written response which is enclosed.

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Unless you publicly announce its contents earlier, we plan no further distribution of this report until 10 days from the date of the report. At that time we will send copies to interested parties and make copies available to others upon request.

We trust this information will be useful to you.

Sincerely yours,

A handwritten signature in cursive script, reading "Charles A. Bowsher".

Comptroller General
of the United States

ENCLOSURE



DEPARTMENT OF THE ARMY
OFFICE OF THE UNDER SECRETARY
WASHINGTON, D.C. 20310

14 June 1983

MEMORANDUM FOR: MR. ZEKE BARAS
US GENERAL ACCOUNTING OFFICE

SUBJECT: Your draft report on AH-64

I appreciate the opportunity to comment on your draft report on the AH-64 program. The information that you have provided Senator Stevens is generally consistent with the information that I have and with the assessment of both the Program Manager and Dr. Sculley, who has personnel in his office specifically assigned to follow the program. The Army is indeed managing this program quite intensively and we all follow it on a current basis. In addition to the programmatic aspects that you refer to we are continuing to work closely with the prime contractor to maintain good control on his overhead because of the continued depressed state of the commercial helicopter market which is largely imposed on the AH-64 contract.

You are welcome, if you wish, to transmit to Senator Stevens this note to you. If you have any other questions, I will be pleased to see that they are answered promptly. I appreciate the opportunity to make these comments.

A handwritten signature in cursive script that reads "James R. Ambrose".

James R. Ambrose
Under Secretary of the Army