

August 1995

# LONGBOW APACHE HELICOPTER

## System Procurement Issues Need to Be Resolved







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

National Security and  
International Affairs Division

B-259390

August 24, 1995

The Honorable C.W. Bill Young  
Chairman  
The Honorable John P. Murtha  
Ranking Minority Member  
Subcommittee on National Security  
Committee on Appropriations  
House of Representatives

The Honorable Floyd Spence  
Chairman  
The Honorable Ronald Dellums  
Ranking Minority Member  
Committee on National Security  
House of Representatives

The Honorable Sam Nunn  
Ranking Minority Member  
Committee on Armed Services  
United States Senate

This report presents the results of our review of the Department of the Army's Longbow Apache weapon system. Because this program is scheduled to enter production later this year, we focused specifically on whether (1) critical issues related to the production of the aircraft and the producibility of its missiles had been addressed and (2) the Longbow Hellfire missile procurement plan was adequately developed. We also reviewed the need for full consideration of all cost-effective alternatives to the production of this attack helicopter system. We believe that the information in this report will be useful as you review the Department of Defense's (DOD) plans for this program.

## Background

The Army plans to upgrade its AH-64A Apache attack helicopter, already considered by the Army to be the most advanced attack helicopter in the world, into a new version known as the AH-64D Longbow Apache. All 758 helicopters in the Apache fleet will be modernized with new avionics and be capable of firing both the laser-guided Hellfire missile and a radar-aided Longbow Hellfire "fire-and-forget" missile that is under development. These improvements are designed to, among other things, allow the Apache to conduct precision attacks in adverse weather,

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automatically engage multiple targets, and operate on the digital battlefield of the future. Additionally, 227 of the 758 upgraded Apaches will be equipped with a new mast-mounted, millimeter-wave fire control radar and more powerful engines.

The Longbow Apache weapon system is composed of three components—a modernized Apache helicopter, a fire control radar, and a Longbow Hellfire missile. In December 1990, it reached milestone II, the decision point for entering the engineering and manufacturing development phase. A production decision—milestone III—is expected in October 1995, and fielding is planned to begin in 1997. DOD has requested \$552.3 million for this system in fiscal year 1996—\$354.8 million for the aircraft and \$197.5 for the missile.

Since its inception, the Longbow Apache program has expanded in scope and size, and program acquisition costs<sup>1</sup> have more than doubled. In 1991, the Army planned to develop and procure only 227 radar-equipped modernized Apache helicopters and almost 11,000 Longbow Hellfire missiles.<sup>2</sup> In May 1993, the program was restructured to include modernizing the entire Apache fleet of 758 helicopters and procuring over 13,000 Longbow Hellfire missiles.<sup>3</sup> Largely because of this restructuring, the estimated cost to develop and procure the Longbow Apache weapon system increased from \$5.4 billion to \$12.3 billion between 1991 and 1994. Program acquisition costs again increased; this time by about \$630 million between 1993 and 1994.

As we reported in 1994, in implementing its aviation modernization plan, the Army chose to fund procurement of both the RAH-66 Comanche reconnaissance and attack helicopter and Longbow Apache attack helicopter while deferring or canceling other helicopter modernization programs.<sup>4</sup> Since then, production of the Comanche program has been deferred. The Army plans to equip some of its Comanche helicopters with the Longbow Hellfire missile and a modified version of the Longbow radar.

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<sup>1</sup>Program acquisition cost includes research, development, test, evaluation, and acquisition costs, and is expressed in escalated dollars.

<sup>2</sup>Longbow Apache Helicopter: Key Factors Used to Measure Progress in Development Need to Be Changed (GAO/NSIAD-92-43, Nov. 21, 1991).

<sup>3</sup>Longbow Apache Selected Acquisition Report, Dec. 31, 1992, as amended, June 1, 1993.

<sup>4</sup>Army Aviation: Modernization Strategy Needs to Be Reassessed (GAO/NSIAD-95-9, Nov. 21, 1994).

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## Results in Brief

During the Longbow Apache's ongoing engineering and manufacturing development phase, concerns have been raised by DOD test and acquisition officials about selected Longbow Apache test events and missile producibility. Some of the concerns that have yet to be resolved are (1) the performance of the Longbow Hellfire missile against targets with multiple countermeasures, (2) the performance of the radar against stationary targets, and (3) the producibility of the missile's transceiver. We believe that resolution of these concerns is critical to a successful transition of the Longbow Apache weapon system to production and that Congress should be apprised of their resolution prior to approving production funds for the program.

The current Longbow Hellfire procurement plan is inadequate because (1) it will procure about 3,200 missiles that are not required at an estimated total cost of between \$540 million and \$750 million and (2) a significant number of the missiles will be procured before Longbow Apache aircraft are available and will lose up to one-half of their shelf life.<sup>5</sup> Because of DOD's concern about the high cost of the missile, the Army is implementing a cost-reduction plan that includes a 5-year production contract requiring congressional notification. However, if the procurement is reduced, the Army will have to renegotiate the contract terms to determine what savings can be achieved. We believe Congress should be apprised of the quantities, cost, and operational impact of the Longbow Hellfire procurement plan before approving the 5-year contract for production of the Longbow Hellfire missile.

DOD guidance for developing a cost and operational effectiveness analysis (COEA) requires that (1) a wide range of alternatives be considered, including conceptual systems and (2) all reasonable options should be represented, including even doubtful alternatives, in order to establish their merit. While the Army has recently agreed to conduct a Longbow Apache COEA for the milestone III production decision, the value of that analysis will be limited because of its timing and the Army's decision not to look at all attack helicopter alternatives, including the Comanche helicopter. We believe Congress needs to be aware of the cost effectiveness and military worth of the Longbow Apache weapon system as compared to alternatives such as the Comanche, prior to appropriating funds for production of these systems.

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<sup>5</sup>Shelf life is the expected length of time an item can be in the inventory before it must be used or refurbished.

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## Critical Testing Issues Have Yet to Be Resolved

Since the Longbow Apache weapon system entered the engineering and manufacturing development phase in 1990, concerns have been raised by DOD test and acquisition officials about various aspects of the program. These concerns could have a potentially serious impact on the Longbow Apache program and, therefore, should be resolved.

For example, the performance of both the Longbow radar and Longbow Hellfire missile are concerns. Poor results during specific segments of early proof-of-principle testing and later testing demonstrated that the radar and missile have had difficulty meeting some important test goals. Radar problems include misidentification and nondetection of some targets and difficulty in developing radar-related software for different terrains. Missile problems include less-than-satisfactory performance against targets defended with multiple countermeasures such as smoke and active jammers.

The reliability, availability, and maintainability of the Longbow Apache helicopter are also concerns. In September 1990, we reported on the low availability rates of the basic Apache helicopter due to reliability, availability, and maintainability problems. Because the Longbow Apache is a major modification of the basic Apache helicopter, we also noted that (1) the Apache's existing logistical support problems may affect the Longbow Apache and (2) the Longbow Apache should clearly demonstrate its logistical supportability before proceeding into production.<sup>6</sup> In July 1994, a DOD test official noted that the logistics reliability of the Longbow Apache was a recurring issue. Also, in its October 1994 Longbow Apache readiness and support assessment for long-lead production, DOD affirmed its concern with logistics reliability when it noted that the logistics reliability parameter for the fire control radar, which was incorporated in the Acquisition Program Baseline in February 1992, was deleted in March 1994. After discussions between DOD and the program office, the logistics reliability parameter was put back into the baseline.

Questions have also been raised about the ability to produce the Longbow Hellfire missile's transceiver in mass quantities. The Army found that the initial transceiver design did not meet all of the specification requirements and was not designed to be compatible with automated production processes. As a result, the transceiver was redesigned, but the Army could not provide us with the qualification test results because the results have not been fully analyzed. While the Army maintains that this problem is not

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<sup>6</sup>Apache Helicopter: Serious Logistical Support Problems Must Be Solved to Realize Combat Potential (GAO/NSIAD-90-294, Sept. 28, 1990).

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expected to affect missile performance, it does acknowledge that the problem has delayed missile testing and validation.

DOD test and acquisition officials told us that resolution of these concerns is important to the overall success of this program and, therefore, DOD needs to make sure they are resolved by milestone III. According to DOD, developmental and operational testing has been completed; however, the classified test results have not been analyzed and authenticated. Therefore, DOD has not issued a report on Longbow Apache testing.

According to the program manager, the Longbow Apache weapon system performed so well in its operational testing that the Army was able to conclude testing early. However, a DOD developmental test official informally expressed dissatisfaction with the Longbow Apache's operational test, specifically that multiple countermeasure testing may not be completed and that missile, radar, and aircraft test results had not been integrated to give a total system picture. According to a DOD operational test official, results may not be as good as the program manager observed, but they are generally good. He noted that (1) there are a few weak points but data had not been synthesized and validated to determine their significance and (2) although the system did not meet every specification exactly and was not tested against all jammers and reactive armor, it performed successfully in the field.

As previously discussed, one of the concerns with the Longbow Apache weapon system is the missile's inability to perform against active countermeasures like jammers. It would seem, therefore, that operational testing would have included tests against all jammers. In June 1995, DOD confirmed that the analysis of test results is currently ongoing and is expected to be a key factor in the milestone III decision.

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## Longbow Hellfire Procurement Plan Is Inadequate

Our review indicated that the Longbow Hellfire missile procurement plan is inadequate because (1) it will procure about 3,200 missiles that are not required at an estimated cost of between \$540 million and \$750 million and (2) a significant number of the missiles will be produced before Longbow Apache aircraft are available and will lose up to one-half of their shelf life. At DOD's direction, the Army has developed an \$862 million cost-reduction plan, which includes a 5-year production contract that would require congressional notification. However, if the procurement is reduced, the Army will have to renegotiate the contract terms to determine what savings can be achieved.

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## Longbow Hellfire Requirements Are Overstated

The Army plans to procure about 3,200 more Longbow Hellfire missiles for the Longbow Apache program than are required. While the Army has approved plans to procure 13,311 Longbow Hellfire missiles, a computational error resulted in this requirement being overstated. This error may result in program costs of between \$540 million and \$750 million, depending upon whether the Army achieves its recently adopted cost-reduction goals.

Using corrected data, we calculated that the total procurement objective for the Longbow Hellfire missile program should be 10,108 for the Longbow Apache. The Army approved program of 13,311 missiles for the Longbow Apache is, therefore, overstated by approximately 3,200 missiles. An official in the Office of the Deputy Chief of Staff for Operations and Plans, who is responsible for munitions requirements, confirmed that the procurement objective was overstated. According to him, the overstatement occurred because the Army used the wrong model for calculating the procurement objective.

The exact cost of these unneeded missiles is dependent on whether or not the Army achieves the cost reductions expected under the missile cost-reduction plan. If all of the planned cost-reduction initiatives are achieved, the unit cost may be reduced to \$169,000 and, therefore, the cost of the approximately 3,200 unneeded missiles could be about \$540 million. If none of the reduction initiatives are achieved, the unit cost may remain \$234,000 and, therefore, the cost of the unneeded missiles could be about \$750 million.<sup>7</sup>

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## Significant Portions of Missiles' Shelf Life May Expire Before Aircraft Are Available

The timing for fielding the Longbow Apache helicopter and delivering the Longbow Hellfire missile differs to such an extent that significant portions of the missiles' shelf life will expire before Longbow Apache helicopters are scheduled to be available to use them. The missiles have a designed shelf life of 10 years and program officials told us that, based on experience with the laser Hellfire missile, it is possible to extend that shelf life to 15 years. In its comments to this report, DOD stated that a 15-year shelf life is reasonable. The Army plans to accept the last Longbow Hellfire missiles in fiscal year 2005 and field the last Longbow Apache helicopter to operational units in fiscal year 2014.

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<sup>7</sup>These estimates are based on projected average unit costs. Actual cost reductions would depend on when missile reductions take place.

We calculated that the Longbow Apache fleet will require 7,168 Longbow Hellfire missiles in fiscal year 2010; however, the missile inventory is projected to be 13,253<sup>8</sup> missiles in fiscal year 2005. Therefore, by 2010, over 6,000 missiles will have used at least one-half of their designed 10-year shelf life and one-third of their anticipated 15-year extended shelf life waiting to arm a helicopter.

Current Army procurement plans call for the Longbow Hellfire missile to be used on the Comanche helicopter. An Army official informed us that the Army might shift some or all of the 3,200 missiles unneeded for the Apache Longbow to the Comanche program, if it is produced. Our analysis shows that, even if their use on the Comanche is approved, a significant portion of the shelf life of those missiles will expire before they are needed.<sup>9</sup> The Comanche would likely need only approximately 234 Longbow Hellfire missiles by 2010.<sup>10</sup> Therefore, about 2,966 of the unneeded 3,200 missiles the Army plans to have procured would spend at least one-half of their designed shelf life and one-third of their anticipated 15-year extended shelf life without a helicopter to carry them.

## Longbow Hellfire Procurement Risks Have Increased

DOD directed the Army to reduce the procurement cost of the Longbow Hellfire missile. In December 1994, DOD approved the Army's plan to reduce missile procurement costs from \$3.1 billion to \$2.3 billion, thereby reducing the procurement unit cost from \$234,000 to \$169,000.<sup>11</sup> This compares to the latest procurement unit cost of \$53,000 for the laser-guided Hellfire II missile. The Army plans to buy the 13,311 Longbow Hellfire missiles in 8 years instead of 10, significantly increasing the numbers of missiles produced per year, beginning in fiscal year 1998. This is expected to reduce the contractor's costs, which will be reflected in lower unit costs. Integral to the cost-reduction plan is a 5-year production contract for fiscal years 1999 through 2003 that will require congressional notification.

<sup>8</sup>This reflects a reduction of 58 missiles from the planned buy of 13,311. The 58 will be used for testing.

<sup>9</sup>DOD has delayed a Comanche full production decision until July 2006. The planned six early operational capability aircraft to be built by 2001 will not be armed until 2004. See our report, *Comanche Helicopter: Testing Needs to be Completed Prior to Production Decisions* (GAO/NSIAD-95-112, May 18, 1995).

<sup>10</sup>This is based on a review of aircraft fielding information and an assumption that each fielded aircraft will require only six Longbow Hellfire missiles.

<sup>11</sup>The procurement unit cost excludes \$386.8 million in program research, development, test, and evaluation costs. If this \$386.8 million were included, the unit cost would be \$263,000, prior to the approval of the cost-reduction plan.

A December 1994 memorandum from the Under Secretary of Defense (Acquisition and Technology) releasing funding for the Longbow Hellfire cost-reduction effort noted that it contains higher cost risk than previously existed in the program. The assessment cautioned that the plan's savings depend on quick congressional notification of the 5-year contract and the Army's timely development and implementation of the reduction initiatives. It also noted that the 5-year contract proposal represented a substantial portion of the projected savings.

The Army's current procurement plan (the cost-reduction plan) is predicated on a peak production rate of 183 missiles per month and a reduced production timeframe. A large part—\$468 million—of the total cost reduction is dependent upon the 5-year contract the Army presently plans to ask Congress to approve in 1999. If the 5-year contract is not approved or the procurement plan is reduced, the Army will have to renegotiate contract terms to determine what savings, if any, can be achieved. Moreover, these savings may be obviated by the costs that will be incurred to replace the missiles acquired under the cost-reduction program's accelerated delivery plan when they become unusable because their shelf life expired.

## Army Has Not Considered All Alternatives to Production of the Longbow Apache

DOD Directive 5000.2 requires a COEA to determine the most cost-effective alternative available and military worth<sup>12</sup> to the government during the early stages of a system's development. This requirement may be waived for classified programs. DOD and Army officials told us that at the July 1989 milestone I, the decision point for starting a new acquisition program, the Longbow Apache weapon system was a classified radar program and did not meet the monetary threshold for a COEA. According to these officials, the Army was not required to do a COEA. By the December 1990 milestone II, the program was unclassified, and the program met DOD's criteria for requiring that a COEA be conducted, including the monetary threshold. Despite DOD guidance, the Army did not complete and submit an adequate COEA.

In May 1994, noting that an appropriate COEA had not been conducted for milestones I or II, DOD again directed the Army to conduct a Longbow Apache COEA for milestone III to compare alternative approaches to satisfy the Army's need for a heavy division attack helicopter. According to a DOD official, the Army plans to complete the COEA in August 1995.

<sup>12</sup>Military worth is the measure of how a system performs its mission in a competitive environment, including the potential of the system. It is measured against the operational concept and operational effectiveness.

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While DOD originally intended that the Army evaluate the Comanche as an attack alternative to the Longbow Apache, the Army subsequently convinced DOD that it should exclude from the COEA any analysis of the Comanche as an attack alternative. The Army's stated position was that the Comanche (1) was a high-value asset that would not be used as an attack helicopter in a heavy division and (2) would not be available for the attack role until after 2006, and, therefore, would not meet the Army's attack requirement at the turn of the century. According to DOD officials, the Comanche alternative was excluded from the Longbow Apache COEA because it would not meet the Army's near- to mid-term heavy attack helicopter requirement.

The DOD and Army positions on the availability of the Comanche seem to contradict DOD's own guidance for developing a COEA. This guidance requires that (1) a wide range of alternatives be considered, including conceptual systems and (2) all reasonable options should be represented, including even doubtful alternatives, in order to establish their merit. Moreover, the program schedule shows that low-rate initial production and full-rate production for the Comanche are planned for 2004 and 2006, respectively.

The Army's current position that the Comanche would not be used as an attack helicopter in a heavy division appears questionable because (1) it contradicts a prior Army assessment of the Comanche's capabilities, (2) the Comanche and Apache have many similarities in attack capabilities, and (3) the Comanche recently vied for a British contract for an attack helicopter. In 1986, the Army reported to the Senate Armed Services Committee that if the Comanche should meet "the Army's full expectations, [it] may well prove to be a viable alternative to eventually replace the AH-64 [Apache] . . ." In our May 27, 1992, report on the need to reassess the Comanche program, we pointed out the similarities in the attack capability of the Comanche and Apache helicopters.<sup>13</sup> At that time, DOD noted that configuring the Comanche as an anti-armor attack aircraft by mounting its external wings and additional missiles provides a very lethal attack asset; however, it reduces the aircraft's capability to perform the reconnaissance mission. In addition, the Comanche's contractors recently entered it in a competition with the Longbow Apache and other helicopters for a key contract to provide the British government attack helicopters.

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<sup>13</sup>Comanche Helicopter: Program Needs Reassessment Due to Increased Unit Cost and Other Factors (GAO/NSIAD-92-204, May 27, 1992).

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## Recommendations

We recommend that the Secretary of the Defense direct the Secretary of the Army to (1) modify Longbow Hellfire missile procurement requirements to reflect accurate computational factors and shelf life projections and (2) include comparisons to all alternative attack helicopters, especially the Comanche in its detailed cost-effectiveness and military worth analysis of the Longbow Apache program.

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## Matters for Congressional Consideration

Congress may wish to consider restricting access to fiscal year 1996 Longbow Apache weapon system production funds until the Secretary of the Army provides a report to Congress detailing the results of (1) developmental and operational testing as related to the issues in this report, (2) the Longbow Hellfire missile requirements, and (3) the analysis of the program's comparative cost-effectiveness and military worth. Also, when the Army submits its 5-year contract for Longbow Hellfire missiles, Congress may wish to ensure that the Army has recomputed the number of missiles needed, reconciled the timing of the missile deliveries with the availability of the helicopters, and recomputed the expected cost reductions to be achieved in approving the multiyear contract.

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## Agency Comments and Our Evaluation

Concerning our recommendation to modify Longbow Hellfire missile procurement requirements, DOD acknowledged that the requirements should be reviewed and indicated that all requirements will be reviewed using the capabilities-based requirements process in accordance with the Secretary of Defense's direction. DOD also indicated that the Army is considering alternatives to accelerate Longbow Apache deliveries to better match missile fielding dates.

While DOD's intent to recompute missile requirements is a step in the right direction, we believe that because it will not be done until January 1996, 3 months after the milestone III decision, it will be too late to benefit the Defense Acquisition Board (DAB) and Congress in their decision making. Expediting the requirements recomputation would help these decisionmakers and, at the same time, help DOD in formulating alternatives to better match missile and aircraft fielding dates.

DOD's proposal to accelerate aircraft deliveries is not reasonable because decisions on Longbow Apache production should not be driven by the Army's missile cost-reduction plan. Longbow Apache production schedules were developed to meet the Army's need for an improved attack helicopter within the funding limitations that exist. Given the cost of the

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aircraft compared to the missile, we believe it would be more reasonable to match missile production to aircraft deliveries. Additionally, as noted in the report, DOD's alternatives need to consider the cost to replace those missiles that become unusable when the shelf life expires because of the cost-reduction program's accelerated delivery plan.

Regarding our concerns on the lack of full consideration of alternatives in the cost-effectiveness analysis of the Longbow Apache weapon system, DOD stated that the formal COEA to be done to support the October 1995 DAB review would not include the Comanche as an alternative because it could not meet the Army's near- to mid-term heavy attack helicopter requirement.

As we previously indicated, we believe, based on DOD's own guidance, that the multirole Comanche should be included in any analysis. Low-rate initial production is scheduled for 2004 with initial operational capability and full-rate production scheduled for 2006. DOD's guidance for developing a COEA requires that (1) a wide range of alternatives be considered, including conceptual systems and (2) all reasonable options should be represented, including even doubtful alternatives, in order to establish their merit. Moreover, including the Comanche in the COEA could provide important cost-benefit information that could affect production decision milestones for the Comanche.

Concerning our matters for congressional consideration, DOD commented that (1) DOD has not yet submitted a request for the multiyear procurement for the Longbow Hellfire missile and that Congress can reconsider DOD's position after the request and (2) Congress does not need to restrict fiscal year 1996 funds because the DAB, in making its production decision, will consider the weapon system's developmental and operational testing concerns and its cost-effectiveness.

After carefully reviewing DOD's comments, we continue to believe that Congress may wish to restrict access to program funds until the Army provides the type of information we suggest. In our opinion, Congress needs this information before milestone III if it is to make an informed decision on the future funding of the program. DOD points out that the DAB will review developmental and operational testing results concerning critical technical issues and transceiver producibility will be addressed in the cost-reduction program. However, as noted in our report, testing may not have adequately addressed all of the issues discussed. Further, the focus of the cost-reduction program could change if missile quantities are

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reduced to the levels we believe are valid. The Army will not recompute requirements for the Longbow Hellfire missile until the next budget cycle, 3 months after the October 1995 milestone III review.

We have modified our suggestion about the multiyear contract to clearly indicate that the contract has yet to be submitted to Congress. We still maintain, however, that Congress needs to know the correct missile requirement for the program and how the recomputed missile requirement will impact the savings the Army expects to achieve by using the multiyear contract.

Finally, as previously discussed, we do not believe the Army's planned COEA will provide an adequate evaluation of the Longbow Apache's comparative cost-effectiveness and military worth as it will not consider all alternative attack helicopters, especially the Comanche.

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## Scope and Methodology

To determine whether critical issues related to the production of the aircraft and the producibility of its missiles had been addressed, we reviewed various program research, development, and acquisition documentation related to the Longbow Apache weapon system. We interviewed officials at the Office of the Secretary of Defense, Washington, D.C.; Army Aviation and Troop Command, St. Louis, Missouri; Air-to-Ground Missile Systems Project Office, Missile Command, Huntsville, Alabama; Army Materiel Systems Analysis Activity, Aberdeen, Maryland; and Operational Evaluation Command, Alexandria, Virginia. Developmental and operational test results are classified, and DOD had not analyzed and authenticated them by the end of our review.

To determine whether the Longbow Hellfire missile procurement plan was adequately developed, we interviewed cognizant Army officials involved in the missile requirements setting process and performed our own analyses on the missile inventory and requirements data provided. We talked to officials located in the Air-to-Ground Missile Systems Project Office, Missile Command, Huntsville, Alabama, and the Office of the Army's Deputy Chief of Staff for Operations and Plans, including the Aviation Division, Combat Support/Combat Service Support/Common Systems Division, and Requirements Program and Priorities Division, Washington, D.C.

To determine whether the Army conducted a thorough comparative cost-effectiveness study, including alternative helicopter systems, we

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reviewed related DOD directives and guidance as well as other DOD and Army documents. We interviewed officials from the Office of the Secretary of Defense, Washington, D.C.; Army Aviation and Troop Command, St. Louis, Missouri; and Training and Doctrine Command, Fort Rucker, Alabama.

We conducted our review from August 1994 to May 1995 in accordance with generally accepted government auditing standards.

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We are also sending copies of this report to the Chairman, Senate Armed Services Committee; the Chairmen and Ranking Minority Members of the Senate Committee on Appropriations, Senate Committee on Governmental Affairs, and the House Committee on Government Reform and Oversight; the Director of the Office of Management and Budget; and the Secretaries of Defense and the Army. We will also provide copies to others upon request.

This report was prepared under the direction of Thomas J. Schulz, Associate Director, Systems Development and Production Issues. Please contact me on (202) 512-4841 if you or your staff have any questions concerning this report. Major contributors to this report are listed in appendix II.

A handwritten signature in cursive script that reads "Louis J. Rodrigues". The signature is written in black ink and is positioned above the typed name and title.

Louis J. Rodrigues  
Director, Systems Development  
and Production Issues

# Comments From the Department of Defense



ACQUISITION AND TECHNOLOGY

## OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON  
WASHINGTON DC 20301-3000



30 JUN 1995

Mr. Louis J. Rodrigues  
Director, Systems Development and Production Issues  
National Security and International  
Affairs Division  
U.S. General Accounting Office  
Washington, D.C. 20548

Dear Mr. Rodrigues:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "LONGBOW APACHE HELICOPTER: System Cost and Operational Effectiveness Need to be Demonstrated," dated May 30, 1995, (GAO CODE 707087), OSD Case 9941. The Department partially concurs with the GAO final report.

See pp. 11-12.

A formal Cost and Operational Effectiveness Analysis (COEA) for the Longbow Apache Helicopter will be completed to support the October 1995 Longbow Defense Acquisition Board (DAB) review. Although the DAB review will include the detailed analysis that the GAO suggested in Recommendation 1, the DoD does not agree with including the specific Comanche alternative in the COEA, because it would not be available to fill the near to mid-term heavy attack helicopter battalion deficiencies.

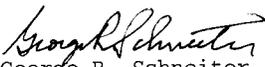
See pp. 10-11.

The DoD notes that the critical issues have been evaluated during developmental and operational testing. The analysis of those results will be key to the DAB decision. The DoD also agrees that the Longbow Hellfire requirements should be reviewed based on the capability-based munitions requirement process in accordance with Defense Planning Guidance.

See pp. 11-12.

The DoD disagrees with the GAO suggestions that the Congress needs to restrict the Longbow FY 1996 production funds and defer approval of the multi-year procurement. In making a production decision, the DAB review will consider the concerns raised by the GAO. The Congress can appropriate FY 1996 funds and approve the multi-year procurement contingent upon a favorable DAB decision.

The detailed DoD comments on the report findings and recommendations are provided in the Enclosure. The Department appreciates the opportunity to comment on the GAO report.

  
George R. Schneiter  
Director  
Strategic and Tactical Systems

Enclosure

Appendix I  
Comments From the Department of Defense

GAO DRAFT REPORT - DATED MAY 30, 1995  
(GAO CODE 707087) OSD CASE 9941

"**LONGBOW APACHE HELICOPTER: System Cost and Operational Effectiveness Need to be Demonstrated**"

DEPARTMENT OF DEFENSE COMMENTS

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FINDINGS

**FINDING A: Army Has Not Adequately Evaluated the Cost Effectiveness of the Longbow Apache.** The GAO reported that since its inception, the Longbow Apache program has expanded in scope and size, and program costs have more than doubled. The GAO noted that despite repeated DoD direction to do so, the Army has not completed an approved cost and operational effectiveness analysis (COEA) for the Longbow Apache weapon system. The GAO concluded that the failure to produce such an analysis early in the program means that the Army may have made major program decisions without having adequately evaluated the cost and benefits of alternative systems to the Longbow Apache. The GAO further concluded that while the Army has recently agreed to conduct a COEA, the value of that analysis will be limited because of its timing and the Army decision not to include the Comanche helicopter as a possible attack helicopter alternative. The GAO asserted that the Army will not have an adequate analysis of the cost of the weapon system when the Milestone III production decision is made. The GAO believes that the Congress needs to be aware of the cost effectiveness and military worth of the Longbow Apache weapon system, especially compared to the Comanche, prior to appropriating funds for production. (p. 3, pp.4-9/GAO Draft Report)

**DOD RESPONSE:** Partially concur. The DOD agrees that the Longbow program scope and cost have increased since the program's inception. The fire control radar mission kit, which includes the more powerful 701C engines, will be applied to the initial 227 aircraft requirement. A total of 758 Apaches will be upgraded to the Apache D model, however only 227 of them will have the fire control radar and the more powerful 701C engines. The upgrade of the additional 531 Apaches was the major cost driver.

The DOD agrees that the Army has not submitted an approved COEA for the Longbow system. However, a formal COEA, with joint Army and OSD oversight, will be completed before the full rate production decision for the Longbow Apache aircraft and the low-rate initial production decision for Longbow Hellfire. An alternative which included the

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Now on pp. 3 and 8-10.

Comanche in the pure attack role (i.e., heavy attack battalions) was eliminated from the COEA guidance since Comanche would not be available to fill the near to mid-term heavy attack helicopter battalion deficiencies.

Additionally, the Major Aircraft Review and Bottom-up Review supported the Longbow program.

**FINDING B: Critical Issues Have Not Yet Been Resolved.** The GAO reported that during the Longbow Apache's engineering and manufacturing development phase, concerns have been raised about selected Longbow Apache test events and missile producibility. The GAO noted that some of the concerns have yet to be resolved such as (1) the performance of the Longbow Hellfire missile against targets with multiple countermeasures, (2) the performance of the radar against stationary targets, and (3) the producibility of the missile's transceiver. The GAO believes that resolution of these concerns is critical to a successful transition of the Longbow Apache weapons system to production and that Congress should be apprised of their resolution prior to the Milestone III decision. (pp.3-4, 9-10/GAO Draft Report)

**DOD RESPONSE:** Partially concur. The multiple countermeasure and stationary target indicator issues have been Army and OSD concerns. These issues have been addressed by developmental and operational testing. The analysis of test results is currently ongoing and will be a key factor in the DAB decision.

Some of the concerns regarding producibility of the missile's transceiver were already addressed with the Producibility Enhancement Program transceiver design which was tested during development testing and Initial Operational Test and Evaluation. The Unit Cost Reduction program approved on December 2, 1994, will pursue further producibility and cost-reduction improvements through enhancements of the transmitter and receiver subassemblies.

The Army cost reduction and producibility enhancements will be cut into production in the first two low-rate initial production and the first full-rate production buys before a planned multi-year procurement beginning in FY 1999.

**FINDINGS C: Longbow Hellfire Procurement Plan is Flawed.** The GAO concluded that the Longbow Hellfire missile procurement plan is flawed because (1) the procurement objective is overstated by about 3,200 missiles, at an estimated total cost of between \$540 million and \$750 million, and (2) the missiles will lose significant portions of their shelf life before the helicopters from which they are to be launched are available. The GAO noted that at DoD direction, the Army has developed an \$862 million cost

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Now on pp. 3 and 5-8.

reduction plan, which includes a 5-year production contract requiring congressional approval. The GAO asserted, however, if the procurement is reduced, the Army will have to renegotiate the contract terms to determine what savings can be achieved. (p. 4, pp. 11-15/GAO Draft Report)

**DOD RESPONSE:** Partially concur. The requirement for the Longbow Hellfire was calculated before the capabilities-based munitions requirement process was included in the Defense Planning Guidance. The DoD will review the requirement in accordance with the Secretary of Defense direction.

Experience with earlier versions of the Hellfire and similar missile programs indicates at least a 15-year shelf life is reasonable. The Army is considering alternatives to accelerate Longbow Apache deliveries to better match missile and aircraft fielding dates.

\* \* \* \* \*

**RECOMMENDATIONS**

Now on p. 10.

**RECOMMENDATION 1:** The GAO recommended that the Secretary of Defense direct the Secretary of the Army to conduct a detailed analysis of the Longbow Apache program, including all alternative attack helicopters, especially the Comanche, to determine its cost effectiveness and military worth. (p. 15/GAO Draft Report)

See p. 11.

**DOD RESPONSE:** Nonconcur. The Department will convene the DAB to review the Full Rate Production decision for Longbow Apache and the Low Rate Initial Production decision for Longbow Hellfire in October 1995. The DAB will consider Cost and Operational Effectiveness results, test results and whether the program meets its minimum required accomplishments in making a production commitment to the Longbow system.

Now on p. 10.

**RECOMMENDATION 2:** The GAO suggested that the Secretary of Defense direct the Secretary of the Army to modify the Longbow Hellfire missile procurement plan to reflect accurate computational factors and shelf life projections. (p. 15/GAO Draft Report)

See pp. 10-11.

**DOD RESPONSE:** Partially concur. As noted in the response to funding C, the requirement for the Longbow Hellfire was calculated before the capabilities based munitions required process was included in the Defense Planning Guidance. All requirements will be reviewed using the capabilities-based

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munitions requirements process in accordance with Secretary of Defense direction.

\* \* \* \* \*

**MATTERS FOR CONGRESSIONAL CONSIDERATION**

**SUGGESTION 1:** The GAO suggested that the Congress may wish to consider restricting access to fiscal year 1996 Longbow Apache production funds until the Secretary of the Army provides a report to the Congress detailing the results of (1) military worth, (2) developmental and operational testing as related to the issues in the GAO report, and (3) the Longbow Hellfire missile requirements. (p. 16/GAO Draft Report)

Now on p. 10.

**DOD RESPONSE:** Nonconcur. The Congress does not need to restrict FY 1996 funds, since the DAB will consider the military worth and developmental and operational testing related to concerns raised by the GAO, in making a production decision.

See pp. 11-12.

**SUGGESTION 2:** The GAO suggested that the Congress may wish to defer approving the Army proposed 5-year contract on Longbow Hellfire missiles until the Army recomputes the number of missiles needed, better reconciles the timing of the missile deliveries with the availability of the helicopters, and recomputes the expected cost reductions to be achieved in approving the multi-year contract. (p. 16/GAO Draft Report).

Now on p. 10.

**DOD RESPONSE:** Nonconcur. The Department has not yet submitted a request for the multi-year procurement. The Congress can consider the Department's position on the multi-year after the DAB decision.

See pp. 11-12.

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