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GAO

Report to Congressional Requesters

January 1994

U.S. SPECIAL OPERATIONS FORCES

Helicopter Cost Is Understated and Reliability Measures Are Inadequate





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

National Security and
International Affairs Division

B-240262

January 25, 1994

The Honorable Sam Nunn
Chairman, Committee on Armed Services
United States Senate

The Honorable Ronald Dellums
Chairman, Committee on Armed Services
House of Representatives

This report discusses issues related to cost and planned reliability measures associated with MH-47E and MH-60K Special Operations helicopter program. Our objectives were to determine whether (1) the United States Special Operations Command (USSOCOM) has provided Congress with appropriate cost information for the MH-47E and MH-60K helicopter program and (2) the Army's reliability measures for the MH-47E and MH-60K helicopters are adequate.

This report was prepared pursuant to our basic legislative responsibilities. We are bringing this report to your attention because the Department of Defense (DOD) does not agree with the recommendations we are making and we believe they still have merit.

Background

After the 1980 failure of the Desert One hostage rescue attempt in Iran, the need for reliable aircraft capable of moving troops in and out of hostile territory in a clandestine manner in dark and adverse weather conditions became apparent to DOD. To address that need, the Army began a modification program in 1986 for some of its CH-47D Chinook and UH-60 Black Hawk helicopters. The modified helicopters, called the MH-47E and MH-60K, are to be used by the Army's Special Operations Command, a subordinate command of USSOCOM.

Modifications to these helicopters are extensive. The most extensive modification is the newly developed Integrated Avionics Subsystem, which integrates more than 40 pieces of navigation, communication, and survivability equipment. Other modifications include installation of a multimode radar, a forward-looking infrared radar, improved aircraft survivability equipment, an air-to-air refueling system, and mini-guns. Despite all the modifications, the Army saw the MH-47E and MH-60K program as a low-risk means of obtaining urgently needed aircraft.

In 1990, the Secretary of Defense transferred budget authority for the MH-47E and MH-60K program from the Army to USSOCOM.¹ The Army continues to manage the program, however, and is responsible for testing the aircraft and assessing helicopter reliability.

USSOCOM currently plans to procure 26 MH-47E and 23 MH-60K helicopters. The Army has conditionally accepted the first 10 production MH-60K helicopters, and delivery of the final MH-60K is expected in February 1994. The first production MH-47E was delivered to the Army in September 1993, and the final aircraft is to be delivered in November 1994.

Results in Brief

The \$1.2 billion in development and procurement estimates reported to Congress does not reflect the total costs to develop and procure the MH-47E and MH-60K helicopters. Substantial costs associated with these aircraft are not required to be included in the MH-47E and MH-60K budget documents under current DOD budget policy. For example, at least \$367 million in procurement costs have not been included because these costs are included in budget documents for Army programs or Army activities. Also, the total cost to support and maintain the aircraft, estimated to be at least \$3.6 billion, has not been reported to Congress because there is no requirement to provide Congress with life-cycle cost estimates for the MH-47E and MH-60K. Without complete information about the estimated costs to develop, procure, support, and maintain a system, Congress and other decisionmakers may not have all the information necessary for making sound program or funding decisions for expensive weapon systems.

The primary reliability measurement criteria the Army will use to assess the helicopters' reliability is flawed because it only measures their ability to return to friendly territory and not their ability to perform special operations missions. Because the Army is only assessing the ability to return to friendly territory, the measure does not include an assessment of the effectiveness of certain mission essential equipment. The Army plans to collect data for a measure that would better project mission success but does not plan to use this measure as the primary assessment of the helicopters' reliability.

¹Prior to 1990, funding requests for the MH-47E and MH-60K helicopters were included in the Army's budget request. Since fiscal year 1991, funding requests have been included in USSOCOM's budget.

Total Cost of Program Not Being Provided to Congress

USSOCOM provides Congress with budget estimates for the MH-47E and MH-60K in accordance with current DOD budget policy. According to the policy, USSOCOM is required to include only the cost of obtaining unique special operations capabilities in its budget estimates. USSOCOM does not include the costs of items paid for or provided by the Army. For example, the budget estimates provided to Congress do not include at least \$367 million—the cost of the CH-47D airframes, the UH-60L airframes, and the auxiliary fuel tanks and the majority of the costs to procure the T-714 engine. Also not included are the costs of some modifications being made to the MH-47E and MH-60K airframes. These costs appear in the Army's procurement budget request.

In addition, the USSOCOM operations and maintenance budget estimates do not include the life-cycle costs to support and maintain the MH-47E and MH-60K fleet for 20 years. The Army and USSOCOM estimate this cost to be \$3.6 billion. Congress will also likely be asked to provide funds to USSOCOM to correct problems found during operational testing and to complete a \$250-million product improvement program.

DOD Instruction 5000.2 requires that managers develop life-cycle cost estimates for all programs. Life-cycle cost estimates differ from budget estimates in the scope of information provided. Generally, DOD budget estimates provide cost information for the upcoming fiscal year as well as 1 or 2 previous fiscal years, and do not include information on funding requests from other appropriations. On the other hand, according to DOD's instruction, life-cycle cost estimates should include all costs associated with developing, procuring, supporting, and maintaining a system throughout its life, regardless of the funding source. Life-cycle cost estimates for the MH-47E and MH-60K program would include all costs paid by the Army, USSOCOM, and other DOD activities.

Although the DOD instruction requires life-cycle cost estimates for all programs, it does not require that such estimates be provided to Congress. Generally, Congress only receives life-cycle cost information for programs that are designated as "major defense acquisition programs"—a program that is expected to spend more than \$200 million (in fiscal year 1980 constant dollars) in research and development funds or more than \$1 billion (in constant 1980 dollars) in procurement funds. The MH-47E and MH-60K modification program is not a major defense acquisition program because it does not meet these thresholds.

In 1990 we issued two reports on the Special Operations Forces helicopter program.² In one we concluded that the Army planned to acquire more MH-47Es than were needed, and in the other, we recommended that the Army develop and provide Congress with a complete cost estimate that accurately reflected all costs associated with acquiring fully equipped, mission-capable special operations helicopters. In response to our recommendation, DOD acknowledged that the program's life-cycle cost estimates were "somewhat deficient" but said that "it does not appear judicious to revise the estimate and it may not be possible." We continue to believe that Congress needs complete information about all program costs for this as well as future USSOCOM weapon systems programs in order to make informed decisions.

Army's Reliability Measures Are Not the Most Appropriate Ones

Army officials plan to use two reliability measures as part of their assessment of whether the MH-47E and MH-60K can be released to perform special operations missions. The measures "mean time between emergency flight terminations" and "mean time between mission abort" do not provide sufficient information on the ability of the helicopters to successfully perform special operations missions. Neither measure assesses the reliability of all the equipment necessary to perform special operations missions.

Mean time between emergency flight terminations, the Army's primary reliability measure, is the average time between emergency landings in hostile territory due to failures of flight critical equipment such as engines, rotor systems, and navigation systems; the measure does not assess the likelihood that the helicopters will complete missions. For example, if a failure of one of a helicopter's two engines prevented successful completion of its mission, the failure would not be counted as an emergency flight termination if the aircraft was able to safely return from hostile territory. Failure of other equipment such as the communications equipment would also be excluded by the measure because the Army does not consider such equipment flight critical, even though it is considered essential for all missions.

Army officials stated that mean time between emergency flight terminations was selected because of the unique nature of special operations missions. According to Army officials, many of the missions the special operations forces undertake have a low probability of success, and

²Special Operations Forces: Army Plans to Buy More MH-47E Helicopters Than Needed (GAO/NSIAD-90-118, Feb. 14, 1990) and Special Operations Forces: Army Plans Highly Concurrent Acquisition Strategy for Costly Helicopters (GAO/NSIAD-90-267, Sept. 28, 1990).

it is important for commanders to know that the aircraft and crew have a high probability of returning to friendly territory should a mission fail. Thus, the Army established mean time between emergency flight terminations as the primary reliability measure for these aircraft despite the fact that the reliability measure does not measure mission success. However, according to documentation provided by the product manager's office, the need to have aircraft with a high probability of mission success was the principal reason for undertaking the extensive and expensive modification program.

The Army's secondary measure of the reliability for the MH-47E and MH-60K, mean time between mission abort, is the average time between equipment failures that prevent completion of the mission in progress. Failures of mission essential equipment that prevent another mission from being completed are not included in this average. For example, a failure of the multimode radar's adverse weather capabilities would not be included in the mean time between mission abort average if the mission was being flown in good weather. In addition, mean time between mission abort does not assess the reliability of aircraft survivability equipment, even if it is necessary to perform the mission in progress. Although Army officials believe that aircraft survivability equipment is necessary to perform the special operations missions, they have not categorized the radar, laser and missile warning systems, or the radar jamming systems as mission essential. Because this equipment has not been classified as mission essential, the reliability of this equipment is not measured by either of the Army's measures.

An alternate reliability measure—"mean time between mission affecting failure"—would provide the most complete measure of the probability of successfully completing a mission if aircraft survivability equipment was designated as mission essential equipment. This measure assesses the reliability of equipment essential to perform any special operations missions. The Army will collect the data to calculate mean time between mission affecting failure but has not established a minimum requirement for this measure. Further, the Army does not intend to use this information as the primary criterion for judging the reliability of the helicopters. The Army is not sure how it will use the information when it makes the determination to field the helicopters for special operations use.

Recommendations

We recommend that the Secretary of Defense direct the Commander in Chief, USSOCOM, to develop life-cycle cost estimates for the MH-47E and

MH-60K as required by DOD Instruction 5000.2 and provide these estimates to Congress, as well as life-cycle cost estimates for all future special operations procurements.

We also recommend that the Secretary of the Army establish mean time between mission affecting failure as the primary reliability criterion for releasing the helicopters for mission use and include all aircraft survivability equipment as essential equipment in assessing the helicopter's reliability.

Agency Comments and Our Evaluation

In commenting on a draft of this report, DOD disagreed with our recommendations. DOD acknowledged that DOD acquisition executives use life-cycle cost estimates to make choices during the acquisition cycle, but it did not agree that Congress needed life-cycle cost information on Special Operations Forces programs like the MH-47E and MH-60K. However, our review indicated that because DOD is only reporting the costs of unique special operations equipment and not total costs, it is understating the government outlay for this program by at least \$367 million. This, coupled with the fact that life-cycle costs are estimated at \$3.6 billion, led us to believe that Congress does need this information.

DOD also disagreed with our recommendation on reliability measures. DOD indicated that (1) the Army uses all available measures of reliability and (2) because the helicopters are in production, changing the existing contract reliability criteria would add significant cost to the program with no corresponding gain in system reliability. However, a memo from the Deputy Under Secretary of the Army to the Commander, U.S. Army Operational Test and Evaluation Command, and the U.S. Army Program Executive Officer for Aviation states that the specific evaluation criteria to support a decision to release the aircraft for special operations is the probability of emergency flight terminations. Moreover, as the Army's previous actions indicate, no change in the contract is required to implement our recommendation.

The Department's comments are presented in their entirety in appendix I, along with our detailed evaluation.

Scope and Methodology

We reviewed MH-47E and MH-60K program documents, including the required operational capabilities documents; the reliability, availability, and maintainability rationale reports; acquisition strategies; minutes of

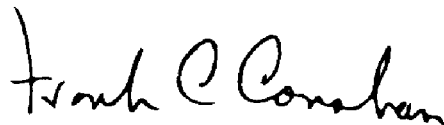
milestone reviews; budget documents; aircraft performance specifications; test plans; and historical files maintained by the Product Manager and others. We also reviewed correspondence of the Army Material Systems Analysis Activity, the Army Operational Test Command, the Product Manager, and the Army.

We interviewed representatives of the following organizations: the Army's Special Operations Aircraft Product Office in St. Louis, Missouri; USSOCOM at the Command's headquarters at McDill Air Force Base and at the Command's Washington, D.C., office; the Army Special Operations Command and the Army Special Operations Aviation Regiment at Fort Campbell, Kentucky; the Army Material Systems Analysis Activity in Aberdeen, Maryland; and the Army Operational Test Command in Alexandria, Virginia. We met with representatives of the Combined Arms Command and with the Special Assistant to Deputy Under Secretary of the Army for Operations Research.

We conducted our work from November 1991 through April 1993 in accordance with generally accepted government auditing standards.

We are sending copies of this report to the Chairmen, House and Senate Committees on Appropriations; the Secretary of Defense; and the Director, Office of Management and Budget.

This report was prepared under the direction of Henry L. Hinton, Jr., who may be reached at (202) 512-4126 if you or your staff have any questions concerning this report. Other major contributors are listed in appendix II.



Frank C. Conahan
Assistant Comptroller General

Comments From the Department of Defense

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301-2500

AUG 17 1993

Mr. Frank C. Conahan
Assistant Comptroller General
National Security and International Affairs Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Conahan:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "SPECIAL OPERATIONS FORCES: Costs and Reliability Measures Inadequate for MH-47E and MH-60K Program," dated June 25, 1993 (GAO Code 393463/OSD Case 9449). The DoD partially concurs with the first two findings, but does not concur with the third finding related to reliability measures or the two recommendations.

See comment 1.

The GAO correctly reported that that the Army continues to manage the program and is responsible for (1) testing the aircraft and (2) assessing helicopter reliability. The DoD also concurs that the budget estimates the U.S. Special Operation Command provides to the Congress are completed in accordance with current DoD policy and only include the cost of obtaining unique special operations capabilities. The DoD further agrees that the GAO accurately reported that DoD guidance does not require that life-cycle cost estimates be provided to the Congress.

See comment 2.

The DoD does not concur with the recommendation that the U.S. Special Operations Command provide life cycle costs estimates for the MH-47E and MH-60K and all other future special operations procurements. The DoD will continue to provide life-cycle cost estimates to the Congress as part of the Selected Acquisition Reports for Acquisition Category I programs, or upon specific request. However, the DoD does not normally provide life-cycle cost estimates on other programs, which includes the MH-47E and MH-60K program. The majority of special operations programs are either Acquisition Category III or IV. Furthermore, while life-cycle cost estimates are used by the acquisition community to support the acquisition process, they are not specifically addressed or considered in the budgetary process for any DoD programs.

See comment 3.

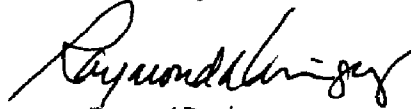
In addition, the DoD does not concur that the Secretary of the Army should establish mean time between mission affecting failure as the major reliability criteria for releasing helicopters for mission use, and include all aircraft survivability equipment as essential equipment in assessing the reliability of the helicopters. The Army uses all available measures of reliability, to include mean time between mission affecting failure, and existing data on the reliability of all aircraft survivability equipment, in deciding whether to recommend release of the helicopters for use by the U.S. Army Special Operations Command. Furthermore, because the helicopters are in production, changing the existing contract reliability criteria would add significant cost to the program with no corresponding gain in system reliability.

**Appendix I
Comments From the Department of Defense**

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The detailed DoD comments on the draft report findings and recommendations are provided in the enclosure. Suggested technical changes to the report have been provided separately to the GAO staff. The DoD appreciates the opportunity to comment on the GAO draft report.

Sincerely,



Raymond Dominguez
Deputy Assistant Secretary of Defense
Forces and Resources

Enclosure

GAO DRAFT REPORT - DATED JUNE 25, 1993
(GAO CODE 393463) OSD CASE 9449

"SPECIAL OPERATIONS FORCES: COSTS AND RELIABILITY
MEASURES INADEQUATE FOR MH-47E AND MH-60K PROGRAM"

DEPARTMENT OF DEFENSE COMMENTS

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FINDINGS

- **FINDING A: The Army MH-47E and MH-60K Special Operations Helicopter Program.** The GAO observed that, in 1986, the Army began a modification program for some CH-47D CHINOOK and UH-60 BLACK HAWK helicopters. The GAO further observed that the modified helicopters--called the MH-47E and MH-60K--are to be used by the Army Special Operations Command, a subordinate command of the U.S. Special Operations Command. The GAO noted that, in 1990, the budget authority for the MH-47E and MH-60K program was transferred from the Army to the U.S. Special Operations Command. The GAO pointed out, however, that the Army continues to manage the program and is responsible for (1) testing the aircraft and (2) assessing helicopter reliability. (pp. 1-4/GAO Draft Report).

DOD RESPONSE: Concur. The Special Operations Command and the Army have an excellent working relationship. The Army acquisition community is committed to delivering reliable helicopters that fully meet the special operations requirements. The Army will test and assess the aircraft reliability. Day to day management of the program is performed by the Army Special Operations Aircraft Product Management Office, with management participation by the U.S. Army Special Operations Command and the U.S. Special Operations Command on critical requirements and acquisition issues.

- **FINDING B: Total Cost of Program Not Being Provided to the Congress.** The GAO reported that the Special Operations Command provides the Congress with budget estimates for the MH-47E and MH-60K program. The GAO found, however, that the budget estimates only include the cost of obtaining unique special operations capabilities and do not include the costs of items paid for or provided by the Army. The GAO concluded that life cycle cost estimates would give decision makers at all levels a more complete picture of the total cost of a program, because life cycle cost estimates for the MH-47E and MH-60K program would include all costs paid by the Army, the Special Operations Command, and other DoD activities. The GAO further explained that, although DoD guidance requires life cycle cost estimates for all programs, it does not require that the estimates be provided to the Congress.

Enclosure

Now on pp. 1-2.

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Now on pp. 3-4.

The GAO referenced two previous 1990 reports (OSD Case 8209 and OSD Case 8416), in which the GAO recommended the Army provide the Congress a complete cost estimate that accurately reflects all costs to the Government associated with acquiring fully-equipped helicopters. The GAO maintained that, in order to make informed decisions, the Congress needs complete information about all program costs for the helicopters, as well as future Special Operations Command weapon systems programs. (pp. 4-6/GAO Draft Report)

DOD RESPONSE: Partially concur. The DoD agrees that the GAO accurately reported that the budget estimates the U.S. Special Operation Command provides to the Congress are in accordance with current DoD policy, and only include the cost of obtaining unique special operations capabilities. The cost of the basic airframes has been reported in the budget documents submitted by the Department of the Army. The DoD further agrees that the GAO accurately reported that DoD guidance does not require that life-cycle cost estimates be provided to the Congress. The U.S. Special Operations Command is in full compliance with current public law and provides all the information requested by the Congress.

The DoD does not concur that the Congress needs life-cycle cost estimates on acquisition category II-IV programs to make informed decisions. Life-cycle cost estimates are developed at specific acquisition milestones to assist DoD acquisition executives in making informed choices. Those estimates are only valid for a given set of assumptions at a specific point in time. The DoD has no reason to update the life-cycle cost estimate for the MH-47E and MH-60K program, because it has already passed acquisition Milestone III, or production approval.

While life-cycle cost estimates are generated to support the acquisition decision making process, they are not specifically addressed or considered in the DoD budgetary process. The DoD Instruction 5000.2 guidance on life-cycle cost estimates only applies to the DoD acquisition decision process, not to the DoD budgetary decision process. Decisions made during the budgetary process, to achieve a budgetary goal, can greatly affect the life-cycle cost of a program.

See comment 1.

- **FINDING C: The Army Primary Reliability Measures Are Not The Most Appropriate Ones.** The GAO found that the Army plans to use two reliability measures to determine whether the MH-47E and MH-60K can be released to perform special operations missions. The GAO noted that the measures--mean time between emergency flight terminations and mean time between mission abort--do not provide sufficient information on the ability of the helicopters to perform special operations missions successfully. The GAO asserted that neither measure assesses the reliability of all the equipment necessary to perform special operations missions. The GAO concluded that an alternate reliability measure--mean time between mission affecting failure--would provide the most complete measure of the probability of successfully completing a mission if aircraft survivability equipment was designated as mission essential equipment. (pp. 7-9/GAO Draft Report)

Now on pp. 4-5.

DOD RESPONSE: Nonconcur. The U.S. Army has a vital interest in fielding the most mission capable weapon system possible. No single reliability measure can provide decision makers all the information they require. The Army acquisition authorities will rely on all available measures of reliability, to include mean time between mission affecting failure, in

See comment 2.

making the decision whether to release the MH-47E and MH-60K for use by the U.S. Army Special Operations Command. The issues and criteria that the test and evaluation agencies will evaluate were tailored to the unique nature of the special operations missions and the acquisition and fielding strategy.

See comment 4.

The senior Army acquisition decision makers and the U.S. Special Operations Command aviation users chose the operational effectiveness and suitability criteria judged best suited to determining whether the MH-47E and MH-60K can be released to perform special operations missions. The acquisition review process provides senior DoD officials the opportunity to review and adjust the criteria as appropriate. The user has stated that the failure of aircraft survivability equipment would not prevent accomplishment of the mission. Therefore, the mean time between mission abort measure was agreed to by the user community and has been included in the contract specification since the beginning of the program. The contract requires a stringent 52 hour mean time between mission abort to achieve a 90 percent probability of completing a 5.5 hour mission. Any change to the contract would add major costs to the program with no corresponding gain in system reliability.

See comment 5.

The GAO has not distinguished between the contractual requirements of the acquisition system and the prerogative of the operational commander in deciding whether an aircraft is capable of performing a given mission. While the reliability of the aircraft survivability equipment may affect the ability to execute certain missions, that information is not crucial to the mission release process. Mission release, from the perspective of the acquisition community, means that the helicopters have satisfied the operational testing criteria established at the start of development. The operational commander will make the final decision on the use of the helicopters for a particular mission.

See comments 6 and 7.

The reliability of any weapon system must be designed in at the beginning of a program. Each system installed in an aircraft is tracked to establish a system reliability measure. The reliability of the helicopters will be calculated during the operational testing. It is based upon the installed systems and can only be improved by changing the systems on the helicopters. When the Army identifies a particular system as having an unacceptably low reliability, then it must make a decision on whether to replace or modify the system.

See comment 8.

The GAO is incorrect in asserting that the reliability of the aircraft survivability equipment is not assessed by any of the Army measures. Since the aircraft survivability equipment is Government furnished equipment to the contractor, the reliability of that equipment has been independently evaluated and is well known. Furthermore, any failure of the equipment will be tracked by the Army Essential Maintenance Action measure.

See comment 9.

* * * * *

RECOMMENDATIONS

- **RECOMMENDATION 1:** The GAO recommended that the Secretary of Defense direct the Commander-in-Chief, U.S. Special Operations Command, to develop life cycle cost estimates for the MH-47E and MH-60K (as required by DoD Instruction 5000.2) and provide the estimates to the Congress, as well as life cycle costs estimates for all future special operations procurement. (pp. 9-10/GAO Draft Report)

DOD RESPONSE: Nonconcur. The DoD has and will continue to provide life-cycle cost estimates to the Congress as part of the Selected Acquisition Reports for Major Acquisition Category I programs, or upon specific request. The DoD Instruction 5000.2 guidance on life-cycle cost estimates applies to the DoD acquisition decision process, not to the DoD budgetary decision process. No useful purpose would be served by providing such estimates for all special operations procurement programs, since the majority of special operations programs are either Acquisition Category III or IV.

- **RECOMMENDATION 2:** The GAO recommended that the Secretary of the Army establish mean time between mission affecting failure as the major reliability criteria for releasing the helicopters for mission use and include all aircraft survivability equipment as essential equipment in assessing the reliability of the helicopters. (pp. 10/GAO Draft Report)

DOD RESPONSE: Nonconcur. The Army will use all available measures of reliability, to include mean time between mission affecting failure, in making the decision whether to release the helicopters for use by the U.S. Army Special Operations Command. Implementing the GAO recommendation will not change the inherent reliability of the helicopters in performing their assigned missions. Furthermore, the Secretary of the Army already has ample data on the reliability of all survivability equipment used on these helicopters. Because the helicopters are in production, there is no basis to change the existing contractual reliability criteria.

See comment 1.

See comment 10.

See comment 3.

The following are GAO's comments on the Department of Defense's (DOD) letter dated August 17, 1993.

GAO Comments

1. Although DOD claims that life-cycle costs are not considered in the budget process, DOD Instruction 5000.2 requires that the life-cycle costs of a program be reviewed at each program milestone to determine if the program is affordable in terms of the budget plans established by DOD's planning, programming, and budgeting system.

Congress has expressed concerns over the serious budget problems facing the Special Operations Command. In its report on the National Defense Authorization Act for fiscal year 1994, the Senate Armed Services Committee questioned the command's ability to provide adequate operations and maintenance funds for systems being fielded as well as to provide funds to develop, procure, and support new systems.

Current budget submissions do not present Congress with complete information on the cost of a weapon system. Accurate life-cycle cost estimates would assist Congress in fulfilling its oversight role.

2. Despite DOD comments, an August 1992 memorandum from the Deputy Under Secretary of the Army to the Commander, U.S. Army Operational Test and Evaluation Command, and the Army's Program Executive Officer for Aviation stated that the specific evaluation criteria to be used when deciding whether the aircraft should be released for special operations missions is the probability of emergency flight termination.

3. We are not recommending that the Army change the reliability requirement in the production contract because such a change is not required to implement our recommendation. The reliability requirement the Army uses to judge the reliability of the aircraft for mission use does not have to be the same reliability requirement the Army has for the contractors. The Army's previous actions indicate this. When the Army decided to use mean time between emergency flight termination to judge the aircraft, it did not change the reliability requirement in the contract.

4. According to representatives of the Army's Special Operations Aviation Regiment, they had no input into either (1) the 1987 decision to establish mean time between mission abort as the aircraft's reliability measure or (2) the 1989 decision to establish mean time between emergency flight termination as the overriding reliability measure for the MH-47E and

MH-60K. Furthermore, they disagree with the definition of success as the ability to return to friendly territory regardless of whether the mission was completed.

According to Army documents and discussions with representatives of the Special Operations Aviation Regiment, the product office, the Army staff, and USSOCOM, the decision to establish mean time between mission abort as the only reliability measure was made in 1987 by the Under Secretary of the Army because he believed that special operations missions require a very high chance of success.

In 1989 the Deputy Under Secretary of the Army added a second reliability measure—mean time between emergency flight terminations and made it the overriding reliability measure for the program. Army officials have stated that mean time between emergency flight termination represents the reliability requirement intended by the Under Secretary in 1987. However, the former Under Secretary of the Army told us that this was not his intention at all. During an interview he told us that he believes the Army changed the reliability requirement because it could not achieve the 52-hour mean time between mission abort requirement. Another Army reliability expert, who has been involved with the program since its inception, shares this view.

5. While the contract definition of mean time between mission abort has always excluded aircraft survivability equipment, as well as other government-furnished and contractor-furnished equipment, this was not always the case with the Army's definition of mission abort. Program documentation indicates that in 1989, representatives of USSOCOM and the Army's Special Operations Aviation Regiment agreed to include failures of the aircraft survivability equipment when calculating mean time between mission abort. The definition was changed to exclude aircraft survivability equipment when the Deputy Under Secretary of the Army decided that the definition was too stringent and directed that a less stringent mission abort definition be developed. The Deputy Under Secretary made his statement after the Army Operational Test Command released a report that indicated that neither the MH-47E nor MH-60K would be able to achieve the 52-hour mean time between mission abort reliability requirement.

6. Because contract reliability requirements do not apply to government-furnished equipment and some contractor-furnished equipment, compliance with the contract requirement will not necessarily

ensure that the overall system mission abort requirements established by the Army will be met. Therefore, we focused our report on the measures the Army will use to judge the aircraft—mean time between emergency flight terminations and a mean time between mission abort definition, which includes all mission essential equipment except aircraft survivability equipment—regardless of who furnished the equipment.

7. The Army has established the performance of aircraft survivability equipment as a critical operational testing criteria and as DOD's comments indicate, mission release means that the helicopters have satisfied the operational testing criteria. The need to have better aircraft survivability equipment was a principal reason for undertaking the modification program. Furthermore, according to Army documents, the performance of aircraft survivability equipment is important because many of the Army's special operations missions cannot be completed without aircraft survivability equipment.

8. Although the Army states that it will calculate the reliability of the MH-47E and MH-60K during operational testing, the decision to release the aircraft for mission use will be made before operational testing is started. Operational testing is scheduled to begin in August 1994 and continue in 1995. However, according to an Army official, once the aircraft are fielded to the units for pilot training, the units will give up the aircraft they currently have and will only have the MH-47E and MH-60K for missions. MH-47E pilot training is scheduled to begin in January 1994, and MH-60K pilot training is scheduled to begin October 1993.

9. We have modified our report to read that the reliability of the aircraft survivability equipment is not assessed by either of the measures established for this program. However, it is important to note that although the reliability of the individual pieces of aircraft survivability equipment may be known, this is the first time the Army has tried to integrate the aircraft survivability equipment. According to Army documents and representatives of the user, the integration of this equipment has proven more difficult than anticipated and problems have developed. Testing of the aircraft survivability equipment is not scheduled to be completed until later in fiscal year 1994.

10. Using the criterion mean time between mission affecting failures would not change the inherent reliability of the helicopters in performing their missions. However, it would provide Army and USSOCOM decisionmakers

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with better information as to the likelihood of the helicopters completing the assigned mission.

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700 4th St. NW (corner of 4th and G Sts. NW)
U.S. General Accounting Office
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