

LEVEL II

P.S. 2

BY THE COMPTROLLER GENERAL

# Report To The Congress OF THE UNITED STATES

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**"SARs" -- Defense Department Reports  
That Should Provide More Information  
To The Congress .**

Important information which would be useful to the Congress and to top-level Defense Department managers is being omitted from DOD's selected acquisition reports. These reports tell where a major weapons program stands in relation to its planned cost, schedule, and performance. Incomplete, misleading, or inaccurate reporting of status could affect congressional and DOD decisions about weapons programs.

GAO recommends that DOD improve the information the reports provide and enforce its instructions on preparing the reports.

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COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20548

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To the President of the Senate and the  
Speaker of the House of Representatives

This report points out ways in which the Department of Defense's selected acquisition reporting system could be changed to present more completely the status and progress of major weapon systems and their expected operational capabilities and limitations. We made this review at the request of the Chairman, Subcommittee on Priorities and Economy in Government, Joint Economic Committee. At his request, we did not obtain formal agency comments due to the time that would have been required.

We are sending copies of this report to the Director, Office of Management and Budget, and the Secretary of Defense.

*James A. Stacks*  
Comptroller General  
of the United States

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COMPTROLLER GENERAL'S  
REPORT TO THE CONGRESS

"SARs"--DEFENSE DEPARTMENT  
REPORTS THAT SHOULD PROVIDE  
MORE INFORMATION TO THE  
CONGRESS

D I G E S T

→ Selected acquisition reports (SARs) have become the key recurring summary reports on the progress of the Department of Defense's (DOD's) most costly acquisition programs. SARs are usually prepared for about 50 major weapon systems and are used by both the Congress and top-level DOD managers in making decisions affecting those systems. However, important information which would be useful to management and which is called for by DOD instructions is not being reported.

The Congress uses SARs, along with research, development, test, and evaluation descriptive summaries; procurement justifications; congressional data sheets; and testimony by DOD officials, in making funding and other decisions on major system acquisitions. Congressional staffs supplement these sources of information with direct personal contacts and information requests.

→ GAO has continually worked with DOD and with congressional committees to improve SARs. GAO's annual reviews of individual weapons systems often have included SAR-related matters.

In GAO's opinion, SARs should provide a full and objective disclosure of the status of major systems. The following improvements which would make SARs more useful to DOD and the Congress, are suggested:

--SARs should contain (in accordance with current instructions) an assessment of how well the system is expected to satisfy its mission and should identify those areas in which it will fall short. The assessment statement should relate to how well the system will perform its mission in the expected operational environment rather

than just to performance specifications listed in the report. (See pp. 5 and 6.)

- The status of related systems and key subsystems should be shown (in accordance with current instructions). (See pp. 9 and 10.)
- The planning estimate should be included in the first report containing the development estimate with an explanation for changes (in accordance with current instructions) and should be retained on subsequent SARs. (See pp. 10 and 11.)
- The planning and development cost estimates should be stated in ranges of costs rather than specific point estimates. (See p. 13.)
- Changes to development estimates should be fully explained in the report containing the change, and subsequent SARs should provide a reference to the original development estimate. (See pp. 13 and 14.)
- SARs should reveal operational and technical risks and critical test issues. (See p. 15.)
- Greater consideration should be given to selected acquisition reporting for important major systems still in the early stages of advanced development. (See pp. 15 to 17.)
- Earlier consideration should be given to deleting from selected acquisition reporting those systems that are near the end of production. (See pp. 16 and 17.)
- SARs should include additional costs required to deploy a weapon system (logistic support/additional procurement costs). (See pp. 17 to 20.)
- SARs should include, as they did prior to June 30, 1979, a chart showing the effect of using different escalation rates to estimate program acquisition cost. (See p. 20.)

--The Secretary of Defense, or a designated official, should certify as to the credibility of the reports. (See p. 22.)

--A periodic independent review should be made of the accuracy and completeness of the reports. (See pp. 20 to 22.)

#### RECOMMENDATIONS

The Secretary of Defense should (1) incorporate into DOD Instruction 7000.3 those improvements presented above which are not currently included and (2) enforce the Instruction's provisions.

GAO recognizes that it is difficult for DOD to decide what information to include in SARs and in what detail. The SARs must be short enough to be usable by people who have little time to review them and yet SARs should present complete, accurate data which is not misleading.

The additional data GAO is recommending that DOD include (such as operational and technical risks, operational capability shortfalls, additional costs needed to deploy a system, and planning estimates) is the kind of data it may not want to include because it detracts from an optimistic presentation of system capabilities and program progress and status. However, it seems to be the kind of data the Congress needs to have in reviewing and funding programs. (See p. 23.)

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## ABBREVIATIONS

|      |                                   |
|------|-----------------------------------|
| AAH  | Advanced Attack Helicopter        |
| DCP  | Decision Coordinating Paper       |
| DOD  | Department of Defense             |
| GAO  | General Accounting Office         |
| HARM | High Speed Anti-Radiation Missile |
| PLSS | Precision Location Strike System  |
| SAR  | selected acquisition report       |

## CHAPTER 1

### INTRODUCTION

The Congress authorizes billions of dollars annually to buy weapon systems. In order for the Congress to make decisions and to allocate national resources among Government programs, it is essential that accurate and informative data be provided on the status and progress of major weapon systems being developed and deployed by the Department of Defense (DOD).

DOD Instruction 7000.3 of February 23, 1968, established the selected acquisition report (SAR) requirement. The SAR's initial purpose was to keep its sponsor, the Assistant Secretary of Defense (Comptroller), apprised of the progress of selected acquisitions and to compare this progress with planned technical, schedule, and cost performance.

In February 1969 the Chairman of the Senate Armed Services Committee asked the Secretary of Defense to provide status reports on major weapon systems. The parties agreed in April 1969 that the SAR would be the vehicle to satisfy the committee's needs. As a result, the SAR became and remains the key recurring summary report on the progress of selected major acquisition programs.

SARs are usually prepared on about 50 major weapon systems. Because SAR coverage normally begins after a system enters full-scale development, many major systems in advanced development are excluded. In addition, most modification projects are excluded from the reporting, even though many exceed the major weapon system criteria.

### INTEREST IN SAR IMPROVEMENTS

The Senate and House Armed Services and Appropriations Committees are the primary congressional users of SARs. These committees have long been concerned with acquiring adequate information on the progress of major weapon systems, particularly those in the early phases of the acquisition process when numerous options are available to the Congress. Other important congressional committees that use SARs are the House and Senate Budget Committees and the House Government Operations Committee.

In 1975 the Congress enacted Public Law 94-106 establishing a legal reporting requirement for SARs. Section 811 provided that:

"(a) Beginning with the quarter ending December 31, 1975, the Secretary of Defense shall submit to the Congress within 30 days after the end of each quarter of each fiscal year, written selected acquisition reports for those major defense systems which are estimated to require the total cumulative financing for research, development, test, and evaluation in excess of \$50,000,000 or a cumulative production investment in excess of \$200,000,000. If the reports received are preliminary then final reports are to be submitted to the Congress within 45 days after the end of each quarter.

"(b) Any report required to be submitted under subsection (a) shall include, but not be limited to, the detailed and summarized information included in reports required by section 139 of title 10, United States Code." 1/

Since Public Law 94-106 was enacted, the dollar thresholds defining a major weapon system have been raised to \$75 million for research, development, test, and evaluation and \$300 million for production. In addition, DOD's Authorization Act for fiscal year 1980 modified the reporting procedures to require that (1) reports for quarters ending on December 31 be submitted within 20 days after the President transmits the budget to the Congress for the following year and (2) the final report for any quarter in which a preliminary report is submitted to the Congress be submitted within 15 days after submission of the preliminary report.

The above congressional actions, as well as (1) the request which resulted in our review and (2) June 25, 1979, hearings before the Legislation and National Security Subcommittee, House Committee on Government Operations, on "Inaccuracy of Department of Defense Weapons Acquisition Cost Estimates," clearly demonstrate the congressional interest in the quality and completeness of SAR data.

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1/Section 139 of Title 10, U. S. Code, requires DOD to report operational test results for major weapon systems for which procurement funds are requested. These test results and other information are included in congressional data sheets submitted annually to the Congress with the President's budget.

## SCOPE AND METHODOLOGY

To comply with the request that we review the selected acquisition reporting system to evaluate its adequacy and to suggest improvements in the system, we:

- Interviewed officials at system program offices, intermediate and higher commands of the military departments, and the Office of the Secretary of Defense to determine (1) their positions on present reporting policy and report processing practices, (2) acceptance of our prior recommendations, and (3) reasons for noncompliance with DOD instructions.
- Compared underlying system cost, schedule, and performance data to that being reported.

We directed our attention primarily to the program highlights, operational/technical characteristics, schedule milestones, and program acquisition cost sections of the reports. We reviewed all SARs of various dates for some parts of our review. For other parts, we reviewed SARs for up to 27 systems which were being reviewed or had been reviewed in 1978-79 as part of our annual reviews of major weapon systems. We selected these systems to make maximum use of available data.

As requested, we did not obtain formal agency comments on the report. The issues identified, however, were discussed with agency officials. We have omitted all classified data in order to issue an unclassified report.

## CHAPTER 2

### BETTER SARs COULD IMPROVE

#### MANAGEMENT OF MAJOR WEAPON SYSTEMS

Both the Congress and DOD's top-level management rely on SARs to tell them where a program stands relative to its planned cost, schedule, and performance. Incomplete, misleading, or inaccurate reporting of status could result in congressional and DOD decisions that would not otherwise be made. We found that important data which, in our opinion, should be available for use in the decisionmaking process is not being provided:

- A required assessment of how well the system is expected to satisfy its mission requirement, including an identification of those areas in which it will fall short, is not always being provided.
- Status information which is required on subsystems and related systems is not always being provided.
- Systems' planning estimates are almost never reported even though they are required by DOD's reporting instructions.
- Changes to a program's development estimate have not always been fully explained, and most SARs that have had changes do not refer to the original development estimate.
- SARs do not reveal data on operational and technical risks or critical test issues.
- Important weapon systems involving significant advanced development funding are almost always excluded from SAR coverage until after the full-scale development decision.
- Some costs of deploying a system (logistic support and additional procurement costs) are normally excluded from SARs.
- The effect of using different escalation rates is no longer being shown.

In addition, some systems in the selected acquisition reporting system do not appear to warrant continued reporting.

We also found that there is no periodic, independent review of the accuracy and completeness of SAR data being provided and that no one certifies to the credibility of SARs.

ASSESSING HOW WELL A SYSTEM WILL  
SATISFY ITS MISSION REQUIREMENTS

In our 1975 report we recommended that each SAR include an assessment as to how well the system is expected to satisfy its mission requirements. This improvement was incorporated into the SAR Instruction in September 1975 as follows

"Program Highlights. \* \* \* This section should also provide an objective assessment as to the extent to which the system is expected to satisfy its current mission requirements, identifying those areas where it will fall short of such objectives."

This data, in our opinion, is among the most subjective and difficult that program managers are to provide in the SAR. On the other hand, it is among the most important and useful.

Assessment is not being  
reported on some SARs

Although the mission assessment statement has been a requirement since 1975, the Office of the Secretary of Defense and the military services have been very lax in requiring program managers to provide them. Our review of the SARs at December 31, 1978, showed that 25 of 52 SARs which DOD sent to the Congress did not include a mission assessment statement, 1/ and only 1 Army SAR (Roland) identified any shortcomings in the system's ability to accomplish its mission requirements.

During our review officials in the Office of the Assistant Secretary of Defense (Comptroller) said they had overlooked the requirement for the mission assessment, but action would be taken to see that future SARs include this statement. Our subsequent review of the September 30, 1979, SARs showed that 12 SARs sent to the Congress still did not include this statement. These SARs were for the Pershing II, Hellfire, Stand-Off Target Acquisition System, Division Air Defense Gun, M-198 Howitzer, Captor, Harpoon, AIM-9L Sidewinder, MK-48 Torpedo (Mod. 1),

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1/Of five additional SARs, which were not sent to the Congress, two did not contain an assessment statement.

SSN-688 Submarine, General Purpose Amphibious Assault Ship (LHA), and CVM-Class Carrier.

The assessment statement  
should be expanded

Congressional hearings and our studies of individual weapon systems reveal numerous limitations and shortcomings of systems in their expected operational environment. Because of the narrow definition applied to the assessment statement, however, these factors are often excluded from the SARs. We believe the SAR would be a more useful report if it summarized these shortcomings and limitations.

The assessment statement, when included, is normally directed toward performance characteristics listed in the report or in a Decision Coordinating Paper (DCP) <sup>1/</sup> and often does not fully convey how well the system will perform in its expected operational environment. Moreover, the statement can be misinterpreted since it follows a section entitled "Mission and Description," which describes the planned operational use of the system. Although the assessment statement normally does not address this mission description, it could be interpreted as such an assessment because it is located so close to the mission description. In our opinion, therefore, some SARs do not give the Congress a good picture of how well the systems are expected to perform, especially regarding system limitations.

SARs may not reflect available information within DOD on expected system limitations unless these limitations are directly related to factors in the operational and technical characteristics section. Moreover, even these limitations may not be shown because the SARs current estimate seems to reflect the optimistic attitude that approved program goals will be met as long as efforts are underway to solve specific problems. For example, testing and other data indicate problems with (1) the XML's maintainability and reliability, (2) Copperhead's ability to meet its effectiveness and single-shot kill probability goals, and (3) the capability of the High Speed Anti-Radiation Missile (HARM). Yet, SARs give little or no indication of these problems.

The following are examples of systems which do not fully present their expected operational capabilities and limitations.

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<sup>1/</sup>Performance specifications in the SARs are generally selected performance specifications listed in a DCP.

### Copperhead

The September 30, 1979, Copperhead SAR states: "It is expected that the Copperhead will satisfy its current mission requirement." The Copperhead mission is described as:

"This projectile will be employed in indirect fire by 155mm units to destroy or neutralize moving and stationary hardpoint targets such as armored and mechanized vehicles and field fortifications."

In addition, the SAR includes a single-shot kill probability which is a function of reliability, hit probability, lethality, probability of proper launch, and probability of proper laser designation (illumination) of the target.

In our opinion, the Copperhead's capability as presented in the SAR is misleading. The SAR does not state that the single-shot kill probability of Copperhead is based on its expected lethality against a specific target. Its lethality against some other targets is expected to be significantly less. In addition, the projectile effectiveness goal does not fully consider environmental and operational factors, such as adverse weather, battlefield conditions, and enemy countermeasures, which can defeat, degrade, or deny the use of Copperhead, primarily by limiting or preventing the required visibility between the target and either the projectile or the laser designator. The September 30, 1979, SAR also does not present recently completed operational testing which resulted in less favorable projectile performance than called for in the SAR's program goal and current estimate. This performance resulted even though test conditions were more favorable than expected operational conditions.

### Roland

The Roland air defense weapon system is described as an all-weather system which, for example, is to operate in a specific level of rain per hour. Although all-weather capability is a prime consideration, the Roland SAR contains no operational or technical characteristics which relate to this requirement. The September 30, 1979, SAR assessment of system capability states that:

"Based on test results/analysis to date, system reliability is less than required. A reliability improvement program is underway and it is estimated that all approved system operational/technical requirements will be achieved."

We believe that the SAR is misleading since it does not acknowledge factors which indicate that the desired operational effectiveness may not be achieved. These factors include:

- Modifications required to meet certain aspects of the threat.
- Problems with performance in rain. (A modification has been proposed to improve performance, and additional testing is planned.)
- A conclusion by the Army test agency that Roland effectiveness should be further examined with emphasis on performance relative to a specific aspect of the threat and on system reliability and maintainability.
- Poor ability to identify "friend or foe" during operational testing. (Improvements are planned.)
- Uncertainty concerning the system's ability to meet a requirement for a 72-hour mission using only organizational maintenance.

#### Precision Location Strike System

The Precision Location Strike System (PLSS) SAR does not present some pertinent performance characteristics which would provide the Congress useful information. The SAR shows the estimated location accuracy for finding pulsed emitters and the estimated accuracy for guided weapons. It does not show PLSS's location accuracy for finding enemy radar jammers or its strike accuracy with unguided weapons. These characteristics are pertinent in assessing PLSS's ability to meet its mission.

In addition, the reported strike accuracy is ambiguous since it could be interpreted as the distance within which a weapon should hit either the target or the point designated as the target location.

#### Navy's 5-Inch, Laser-Guided Projectile

The Navy's SAR for the 5-Inch, Laser-Guided Projectile contains approved program goals, demonstrated performance, and current estimates for numerous operational and technical characteristics. The characteristics listed are for accuracy, range, reliability, lethality, weight, length,

and seeker sensitivity. These factors do not present how effective the projectile will be against its intended targets in the expected operational environment. Additional data, such as single-shot probability of kill against the intended targets and qualifications regarding environmental and operational factors, would, in our opinion, make the SAR more meaningful to the Congress.

#### F-14A and Phoenix

The F-14A and Phoenix SARs describe a capability to intercept six targets simultaneously and to launch missiles nearly simultaneously against six targets. The SARs imply that this is a proven operational capability. In fact, however, the F-14A and Phoenix demonstrated--in development rather than operational testing--the capability to track and launch against six target drones in a controlled environment. Actual launch was not demonstrated. The capability to intercept and launch against six targets in a realistic operational environment has not been demonstrated.

In addition, the F-14A SAR describes a capability for an air-to-surface attack mission. This data is misleading. The Navy's independent test agency has questioned the F-14A's effectiveness in this role.

#### INCLUDING DATA ON THE STATUS OF RELATED SYSTEMS AND KEY SUBSYSTEMS

As a result of our March 1975 recommendation that the status of related systems and key subsystems be shown in SARs, DOD revised the SAR instruction as follows:

"Program Highlights. Briefly summarize the significant developments in the program, including the current status of related systems and key subsystems, except for those covered by separate SAR's."

According to DOD officials, this requirement normally calls for only a brief comment on the status of key subsystems and related systems. Exceptions are that when the status of a related system affects the performance of the major system or when the status of a key subsystem adversely affects the cost, schedule, or performance of the major system, it should be fully reported. We agree with these statements. We found, however, that SARs sometimes present little or no data on key subsystems or related systems. As a result, SARs sometimes present the status of a particular development effort but not a total weapon system.

For example, the GBU-15 weapon system is related to PLSS. The Air Force has planned to use this weapon with PLSS to meet its mission requirements. There is, however, a serious question about the GBU-15's ability to perform effectively. The PLSS SAR does not describe the status of this related system. An Air Force official involved in SAR processing said that it would not be in the best interest of the PLSS program to air GBU-15 problems in its SAR.

Another example is the Army's Copperhead program. This laser-guided, artillery-fired projectile requires that a laser designator illuminate the intended target with laser energy. The primary laser designator is to be the Ground Laser Locator Designator. Use of airborne laser designators which will operate from remotely piloted vehicles and from helicopters is being considered. However, the Copperhead SAR does not present the status of these laser designators. It mentions the possible airborne designators, identifies the Ground Laser Locator Designator, and presents a performance characteristic entitled "Operational Probability of Proper Designation." Reporting the status of related systems is especially needed for Copperhead because the Ground Laser Locator Designator and remotely piloted vehicles are not covered in other SARs and because in late 1977 the designator underwent an operational test, prior to entering production, in which numerous operational problems and concerns were identified.

Less than 25 percent of the SARs we reviewed mentioned the status of subsystems. Of the SARs which do, the December 31, 1978, SSN-688 SAR was a good example. It provided the current status of seven key subsystems.

In contrast, SARs for the Air and Ground Launched Cruise Missiles and Tomahawk Cruise Missile did not provide information on the status of key subsystems. The success of these missiles depends on the ability of the lightweight turbofan engine to provide long-range capability and of the Terrain Contour Matching System to periodically update an inertial guidance system. The Terrain Contour Matching System is critical to achieving the accuracy that cruise missiles require to accomplish their mission requirements. The current cruise missile SARs list subsystems and their contractors but do not comment on their status.

#### REPORTING PLANNING ESTIMATES

The planning estimate is the estimate of operational/technical characteristics, schedule, and cost developed at

the time the Secretary of Defense approves program initiation--the start of advanced development. It is also the first estimate used to gain congressional approval. We have previously recommended that planning estimates be included on SARs to provide greater visibility over programs as they progress.

SAR instructions since 1975 have required that the initial SAR which shows the development estimate for a weapon system shall include the planning estimate and an analysis of the variance between the planning and development estimates. Instructions also require that a copy of this analysis be attached to each subsequent SAR. DOD officials advised, however, that the planning estimate will be shown on the SAR only in those instances in which a system has not reached Milestone II (approval for full-scale engineering development) and a development estimate is not yet available. Since systems are normally added to SAR after they pass Milestone II, most systems have a development estimate for the initial SAR; thus, the planning estimate is not reported.

Only 1 of the last 15 systems added to the reporting system has had its planning estimate reported. The one exception was the Army's Multiple Launch Rocket System, <sup>1</sup>/ which was added in June 1979. Interest in this system dictated that it be given SAR coverage before Milestone II, and thus the initial SAR contained its planning estimate. Earlier, the XM1 tank and the Advanced Attack Helicopter (AAH) were also added to the SAR before reaching Milestone II because of congressional interest. These SARs included planning estimates until the systems reached Milestone II and the development estimate was reported. The required variance analysis was included, and in subsequent SARs the planning estimate was dropped in accordance with DOD's instructions. However, a copy of the variance analysis was not attached to subsequent SARs as required by the instructions.

The value of reporting planning estimates is illustrated by the cost estimate changes which occurred between program initiation and full-scale development for the XM1 and AAH systems:

---

<sup>1</sup>/Formerly the General Support Rocket System.

| <u>System</u> | <u>Planning<br/>estimate</u> | <u>Development<br/>estimate</u> | <u>Increase</u> |
|---------------|------------------------------|---------------------------------|-----------------|
|               | ------(millions)-----        |                                 |                 |
| XM1           | \$3,005                      | \$4,779                         | \$1,774         |
| AAH           | 1,800                        | 3,758                           | 1,958           |

Schedule and performance changes reflected in the development estimates for these systems included

- initial operational capability for the AAH over 2-1/2 years later than in the planning estimate,
- related schedule changes for other AAH milestones,
- a reduction of over 50 percent in certain expendable ordnance on the AAH,
- reduction in the higher values of reliability and ranges for the XM1, and
- schedule changes of from     to 6 months for the XM1.

We believe, therefore, that     important that the initial SAR showing a development estimate explain reasons for changes between it and the planning estimate. We also believe that the planning estimate should be shown in subsequent SARs to provide greater visibility. This information would provide more complete visibility over programs and would provide valuable insight into the nature of planning estimates and the confidence that can be placed on them for new programs.

DOD officials disagreed with our position on reporting planning estimates. They said that planning estimates are shown when (1) they can be defined during the advanced development phase and (2) a request has been made by one of the congressional oversight committees for reporting before Defense Systems Acquisition Review Council II. They stated, however, that:

- Planning estimates are oriented to advanced development in which candidate hardware components of the ultimate major system are demonstrated and

validated to determine whether a weapon system can be developed. As such, planning estimates usually cannot be quantified in sufficient detail to serve as a valid baseline.

--The planning estimates usually cannot be quantified in sufficient detail to permit the initiation of SAR reporting.

--The program reflected in the planning estimates is often not comparable to the program reflected in the development estimate, often because planning estimates contain data on more than one alternative.

We recognize that in instances when a Defense Systems Acquisition Review Council is not held prior to initiation of a program, the cost, schedule, and performance estimates that are available may not be well defined. We believe, however, that SARs should include planning estimates in whatever level of definition exists with a brief explanation for the differences between the planning estimates and the development estimates, when the latter are first reported, so that more complete visibility over a program is possible.

Since planning estimates cannot be well defined relative to the final program and since planning and development cost estimates have normally proven to be significantly less than actual program costs, we also believe that these cost estimates should be stated in ranges of costs rather than specific point estimates. This change also was recently recommended by the House Committee on Government Operations (H.R. 96-656).

#### REPORTING CHANGES TO DEVELOPMENT ESTIMATES

SARs have not always provided a full explanation for changes to a system's development estimate. In addition, explanations for changes are normally provided on a "one-time" basis, and subsequent SARs do not note that the development estimate was revised. Of 51 major systems included in the reporting system as of June 30, 1979, 19 changed their development estimates for performance, schedule, or cost 34 times since 1970. Of the changes, 12 were to provide additional performance specifications or schedule milestones. The remaining 22 changes were revisions to previously reported data.

The significance of the changes could not always be determined from the explanations provided. For example, the Harpoon and DDG-47 SARs reported changes in missile dimensions and in displacement, respectively, but contained no explanation of the impact, if any, of the revisions. Similarly, performance specifications were changed on two occasions for the F-16 without an explanation of the impact of the changes. The combat radius, ferry range, and engine thrust values were reduced, and the thrust-to-weight ratio and acceleration value were increased. The explanations provided were that the development estimates were revised to (1) agree with F-15 data for the F-100 engine and (2) reflect a "for coordination" DCP.

For another system, the Light Airborne Multi-Purpose System MK III, the scheduled initial operational capability date was extended by 15 months. The revision was attributed to "full-scale development."

As another example, the December 31, 1977, SAR on the F-18 reduced the development estimate values for speed, combat ceiling, and rate of climb and increased the estimated weight. According to the explanation provided, the changes were made to represent the project manager's best estimate based on completion of the final design review. This change, in our opinion, limits the visibility and trackability provided by subsequent SARs.

We also found that only eight SARs which immediately succeeded those reporting development estimate changes referred to the changes. Only three June 30, 1979, SARs indicated that their development estimates had been changed.

Concern has long existed about the need to provide complete visibility and trackability of a program's progress. For example, in August 1974 the Senate Appropriations Committee reported (Report No. 93-1104) that

"Changes in planning and development estimates should not be deleted from subsequent reports. SARs should contain a cumulative record of all estimates so that there is total visibility and trackability from a program's inception."

Moreover, in testimony before the House Subcommittee on Legislation and National Security, Committee on Government Operations, in June 1979, the Deputy Secretary of Defense noted that the SAR focuses primarily on exceptions to the

approved baseline plan and includes the explanation for all variances from the program baselines.

#### REPORTING OPERATIONAL AND TECHNICAL RISKS

Neither the SAR, nor the budget justification data, nor prepared statements for budget hearings fully present the operational and technical risks associated with weapon system development and planned use. On occasion these risks are discussed during hearings in answer to specific questions. Presentation of data to the Congress in this manner may occur long after the data is known and has been considered by DOD. DCPs document Defense Systems Acquisition Review Council concerns and recommendations and often contain data on operational and technical risks in either a section on operational and technical risk or a section on critical test issues.

For example, the Hellfire and Copperhead DCPs identify operational and technical risks and critical test issues which cover many of the environmental and operational factors which will degrade system performance such as weather, counter-measures, and battlefield conditions. As another example, the Stand-Off Target Acquisition System DCP lists aircraft survivability as a program risk.

In discussing the possible addition of such a section to the SAR, some DOD officials either questioned whether the Congress needs or wants such information or stated that such data is now provided on request. In our opinion, this data is essential to making informed decisions on major programs. It would alert the Congress earlier of potential system limitations and would provide information which would put the often subjective and seemingly optimistic current estimate of system performance into better perspective. Moreover, formal routine presentation of such data would be a more effective way to provide the information to the Congress.

#### ADDING AND DELETING SYSTEMS

DOD accepted our March 1975 recommendation to provide precise criteria for adding and deleting systems from SARs and revised the SAR Instruction which currently states:

"SAR Additions. New SARs will normally be limited to those major systems which have received Milestone II approval. The addition of a new SAR will be automatic with approval for the system to enter full-scale engineering development, i.e. Milestone II approval or release of Engineering Development (6.4) funds."

"SAR Deletions. Termination of SAR reporting will normally be considered when production of the system is 90 percent complete (i.e., either 90 percent of expected deliveries have been made or 90 percent of expected outlays have been expended) and the program is no longer a P-1 line item. Termination of SAR reporting is not automatic and must be requested and approved prior to the 'as of' date of the last proposed submission. \* \* \*

The instruction also calls for earlier addition to or deletion from SAR coverage based on recommendations from DOD components or appropriate congressional committees.

This revision is an improvement. In our opinion, however, not enough consideration is being given to adding important systems not yet in full-scale engineering development to the reporting. Early and adequate visibility over new weapon systems is necessary if informed decisions are to be made. The SAR system could help provide this visibility. To demonstrate the need for earlier SAR reporting, the following chart shows systems recently added to the SAR, the funds appropriated by the time of their first SAR, and the year of initial funding for the system.

| <u>System</u>          | <u>Fiscal<br/>year<br/>first<br/>funded</u> | <u>Date of<br/>initial SAR</u> | <u>Funding at<br/>time of<br/>initial SAR</u> | <u>Development<br/>estimate</u> |
|------------------------|---------------------------------------------|--------------------------------|-----------------------------------------------|---------------------------------|
| ----- (millions) ----- |                                             |                                |                                               |                                 |
| Multiple Launch        |                                             |                                |                                               |                                 |
| Rocket System          | a/1976                                      | 6-30-79                        | \$125.5                                       | b/\$3,453.8                     |
| Pershing II            | 1975                                        | 3-31-79                        | 152.9                                         | 1,571.0                         |
| HARM                   | 1972                                        | 9-30-78                        | 123.9                                         | c/ 2,409.9                      |
| Stand-Off Target       |                                             |                                |                                               |                                 |
| Acquisition            |                                             |                                |                                               |                                 |
| System                 | a/1974                                      | 9-30-78                        | 37.6                                          | 1,282.8                         |
| PLSS                   | 1972                                        | 3-31-78                        | 57.0                                          | 954.5                           |
| Tomahawk               | 1973                                        | 12-31-77                       | 502.4                                         | 2,422.9                         |
| Air-Launched           |                                             |                                |                                               |                                 |
| Cruise Missile         | 1975                                        | 12-31-77                       | 582.7                                         | 4,181.9                         |

a/Approximate date.

b/Planning estimate.

c/Excludes Air Force funding of \$6.1 million in 1977.

As shown above, the current criteria for adding weapon systems to SARs permits them to be in development for extended periods of time and to have large sums of money expended on them before SAR coverage. Many major weapon systems are currently excluded from SARs because they have not been approved for full-scale development. Current systems in this category include the Joint Tactical Information Distribution System, Navstar, Sound Surveillance System Improvement, Advanced Anti-Submarine Warfare Torpedo, MK-46 Torpedo Near-Term Improvement, and Single Channel Ground and Airborne Radio Subsystem.

In our opinion, there should also be greater consideration to deleting systems from SAR coverage earlier than the normal criteria--90 percent completion of deliveries or expenditures. We believe it is not as critical to have SAR coverage when a system nears completion of production as in earlier stages of the acquisition process when more critical decisions are made. Current systems that we believe should be considered for deletion from SAR coverage are the A-10, Airborne Warning and Control System, F-15, Harpoon, and P-3C.

#### INCLUDING LOGISTIC SUPPORT AND ADDITIONAL PROCUREMENT COSTS

Logistic support and additional procurement costs amount to hundreds of millions of dollars on some systems and can be a major factor in deciding whether to buy a weapon system. Examples of these costs include replenishment spares, modifications, component improvements, common support equipment, production base support/facilities, and other costs listed in the Five-Year Defense Plan Procurement Annex.

As weapon system costs increase, these types of costs will have even greater impact on management decisions. Since its September 23, 1975, revision, DOD's SAR instruction has not required reporting of logistic support and additional procurement costs. In our opinion, these costs should be included in the cost section, and changes from one period to another should be explained.

As the SAR process evolved, DOD made frequent changes in this area. The SAR instruction was revised on June 12, 1976, to require that additional procurement costs (subsequently called logistic support/additional procurement costs) be included. These costs were defined as all procurement costs related to maintaining, operating, or improving a major defense system in addition to its program acquisition cost.

In a letter dated May 25, 1972, the Assistant Secretary of Defense (Comptroller) issued new reporting requirements for logistic support/additional procurement costs. The letter stated that, in the interest of uniformity, clarity, and simplicity of the reporting requirement, only modification and component improvement costs would be reported. All other costs being reported were dropped. In our March 1975 report on the SAR system, we suggested the following:

"Considerable improvement could be made in reporting of logistic support/additional procurement costs. They should be expanded to include all remaining procurement costs related to a program but not currently being reported as program acquisition costs. They should also be included in the cost section of the SAR rather than being reported in a separate section. In addition, this section on logistic support/additional procurement costs should include firm baselines established with footnotes indicating the basis for these baselines, and any changes from these baselines should be provided in the form of a variance analysis."

As stated above, in September 1975 the revised SAR instruction deleted the requirement for reporting logistic support and additional procurement costs.

To illustrate the extent of funding not included in selected acquisition reporting, we requested that the Office of the Secretary of Defense provide cost estimates for logistics support/additional procurement costs for a limited number of systems. The following chart shows the cost estimates provided for the period fiscal year 1978 through 1984 for six systems and their program acquisition cost estimates. The chart shows, for example, that estimated logistics support/additional procurement costs for the P-3C for fiscal years 1978 through 1984 are \$709 million. The program acquisition cost for this program is \$5,485 million. We did not review these cost estimates to determine their accuracy or completeness.

Fiscal year 1978 through 1984 estimates of  
logistic support/additional procurement

| <u>System</u>         | <u>Modifi-<br/>cation</u> | <u>Compo-<br/>nent<br/>improve<br/>ment</u> | <u>Replen-<br/>ishment<br/>spares<br/>(note a)</u> | <u>Other<br/>(note b)</u> | <u>Total<br/>(note c)</u> | <u>Program<br/>acquisi-<br/>tion cost</u> |
|-----------------------|---------------------------|---------------------------------------------|----------------------------------------------------|---------------------------|---------------------------|-------------------------------------------|
| ------(millions)----- |                           |                                             |                                                    |                           |                           |                                           |
| P-3C                  | \$658                     | \$ 6                                        | -                                                  | \$ 44                     | \$ 709                    | \$ 5,485                                  |
| F-14A                 | 522                       | 62                                          | -                                                  | 13                        | 596                       | 12,191                                    |
| A-10                  | 294                       | 118                                         | -                                                  | 93                        | 505                       | 4,812                                     |
| E-3A                  | 181                       | 9                                           | -                                                  | -                         | 190                       | 4,147                                     |
| XM1                   | (d)                       | (d)                                         | -                                                  | 340                       | 340                       | 10,926                                    |
| F-16                  | 758                       | 200                                         | -                                                  | 182                       | 1,140                     | 15,051                                    |

a/DOD officials were not able to identify replenishment spares cost estimates for the individual systems.

b/Includes (1) industrial facilities/production base, (2) simulators (other charges), (3) consumables, and (4) modification spares.

c/Totals may not add due to rounding.

d/As of the President's fiscal year 1980 budget, no procurement improvement program had been established for the XM1 tank program and no wartime life-cycle cost effort had been made.

In 1977 the Congress directed DOD to include in the F-15 SAR the component improvement program funds related to the aircraft's engine. Also the Navy portion of the HARM SAR reports over \$100 million for command and launch equipment. These costs are not shown as part of the program cost estimate but are listed as additional costs.

These examples illustrate the desire on the part of the Congress to have these types of costs reported and the inconsistency of reporting between SARs that report part of these costs and SARs that do not. We believe DOD should report logistic support/additional procurement costs on the SAR.

The DOD position has been that the logistic support/additional procurement costs are unrelated to acquisition costs, are not under the direct control of the project manager, and should not be reported on the SAR. The DOD response to our March 1975 report advised that, as the capability to estimate life-cycle costs improves, consideration may

be given to including these estimates in the SAR. In addition, DOD officials said that draft revisions to SAR instruction were forwarded to oversight committees in 1975 and 1979 and comments were requested. However, no comments were received.

#### PROVIDING COST ESTIMATES BASED ON VARIOUS ESCALATION RATES

Before June 30, 1979, DOD included a chart in the SARs showing how much the total program acquisition cost would decrease or increase if various escalation rates were used. These rates were different from the rate(s) used in developing the SAR's acquisition cost estimate. For example, the March 31, 1979, SAR for the F-18 included a total program acquisition cost estimate of over \$24 billion, including \$11.5 billion for escalation based on a 5.6-percent annual rate. The chart described above showed that the total program acquisition cost would vary if different inflation factors were used, as follows:

| <u>Escalation rate</u> | <u>Resulting change to<br/>program cost estimate</u> |
|------------------------|------------------------------------------------------|
| (percent)              | (millions)                                           |
| 2                      | \$-5,370                                             |
| 4                      | -2,758                                               |
| 6                      | 622                                                  |
| 8                      | 4,580                                                |

DOD officials stated that this information is not needed. Their opinion was based on (1) no indication from their oversight committees that the data was needed when the latest revision to the SAR instruction was submitted for comment and (2) no request from their oversight committees to include this data after it was omitted from recent SAR submissions. In our opinion, since the escalation rates used in SARs have traditionally been lower than actual rates, such a chart served a useful purpose. We believe that DOD should reinstitute the chart and should include escalation rates at least as high as the approximate rate being experienced when the SARs are being prepared.

#### CONDUCTING PERIODIC INDEPENDENT REVIEWS

In our opinion, one of the most important SAR improvements needed is a periodic independent review of the SAR system by the Office of the Secretary of Defense to insure

that SARs are providing consistent and reliable data and full disclosure of the status of major weapons systems.

During the years the SAR has been in existence, DOD's SAR review efforts have been directed primarily toward evaluating recommendations to improve SAR format and guidelines. During 1974 a review was made in response to recommendations by the Congress, elements of DOD, and us. As a result, a revised SAR instruction was issued on September 23, 1975. In 1978 the SAR instruction was reviewed again, and changes were made in format and data requirements. A revised SAR instruction was issued on April 4, 1979. While the SAR instructions and procedures have been improved, DOD has not made an audit, review, or evaluation to assure itself that the instructions are being properly implemented.

DOD has taken the position that since the responsibility for preparing SARs has been delegated to weapon system program managers, they are accountable for their accuracy and completeness. There are SARs on about 50 weapon systems at any time, and program managers have interpreted the instructions in different ways. Another concern we have results from the fact that SARs provide a means of assessing how successfully a program manager is accomplishing program goals. Accordingly, the program manager, as the program advocate, is optimistic about the program. It is essential that program managers be optimistic advocates of their systems, but it is also essential that the Congress be provided status information that is as complete, accurate, and objective as possible. We believe that periodic independent reviews of the SAR system would aid in providing this kind of data.

Examples noted during our review of conflicting, incomplete, or misleading data reported in SARs include

- incomplete test results reported on the HARM SAR related to fuze performance and on the Roland SAR related to tracking tests;
- misleading or incomplete data in the operational and technical characteristics section of the PLSS (see p. 8), Copperhead (see p. 7), and F-18 <sup>1</sup>/ SARs; and

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<sup>1</sup>/Although the Navy has carried out flight tests to evaluate F-18 performance, including acceleration, range, and maintainability, it does not plan to report demonstrated performance data until development aircraft number 9 is flown in June 1980.

--misleading cost data in the Captor SAR because it does not identify substantial costs for torpedoes-- part of the weapon system--which will be taken from Navy inventory but which will subsequently be replaced with new purchases.

#### CERTIFICATION OF SARs

In our previous report we recommended that project officers be responsible for the completeness, reasonableness, and accuracy of SARs and that they certify as to the credibility of the reports. Our recommendation was based on our concern that the many review levels to which SARs are subjected result in changes and additions without full coordination with the project officer. DOD objected to our recommendation because, based on DOD's interpretation, it would have denied the military service Secretaries and the Secretary of Defense their responsibility for reviewing SARs before submission to the Congress.

Our concern still exists, especially in view of the problems identified in our report. Since the SAR is issued from the Office of the Secretary of Defense and some of our current recommendations would expand the scope of the SAR, the Secretary of Defense or his designee should, in our opinion, certify to the credibility of the reports.

#### RECOMMENDATIONS

We recommend that the Secretary of Defense revise the SAR instruction, where necessary, and enforce the instruction so that SARs include

- a mission capability assessment statement, including expected shortcomings and limitations of the system in its operational environment;
- status of key subsystems and related systems, including related systems on separate SARs;
- planning estimates with a one-time explanation for changes to arrive at the development estimates;
- ranges of costs for the planning and development cost estimates rather than specific point estimates;
- more complete explanations for changes to development estimates and, in subsequent SARs, a reference to the original development estimates;

- a section on operational and technical risks;
- logistic support/additional procurement costs and explanations for changes;
- a chart showing the impact on the program acquisition cost estimate of using different escalation rates; and
- a certification to the credibility of SARs by the Secretary of Defense or his designee.

In addition, we recommend that the Secretary of Defense direct that a periodic review be made of the accuracy and completeness of SARs and that greater consideration be given to (1) adding important systems in advanced development to the reporting system and (2) deleting older systems from the reporting.

We recognize that it is difficult for DOD to decide what information to include in the SARs and in what detail. DOD must make the SARs short enough to be usable by people who have little time to review them, and yet SARs should present data that is complete, accurate, and not misleading. Also, the additional data we are recommending for inclusion (such as operational and technical risks, operational capability shortfalls, additional costs needed to deploy a system, and planning estimates) is the kind of data DOD may not want to include because it detracts from an optimistic presentation of system capabilities and program progress and status. However, it seems to be the kind of data the Congress needs to have in reviewing and funding programs.