UNITED STATES GENERAL ACCOUNTING OFFICE

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STATEMENT OF

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UNITED STATES GENERAL ACCOUNTING OFFICE

BEFORE THE

SUBCOMMITTEE ON ADMINISTRATIVE PRACTICE AND PROCEDURE

OF THE COMMITTEE ON THE JUDICIARY

UNITED STATES SENATE

ON

THE RELIABILITY AND AVAILABILITY OF AGENCY INFORMATION AND THE ACCURACY OF DOD WEAPON SYSTEM COST ESTIMATES

Mr. Chairman and Members of the Subcommitee:

I am pleased to be here today to discuss the need for credible reporting of planned and actual costs. I will be talking about cost growth, the Department of Defense's (DOD's) cost estimating and reporting, the underestimation of funding requirements in the Five-Year Defense Programs (FYDP's), and organizational incentives for developing optimistic cost estimates.

Before getting further into my testimony, let me give you some basic background information that illustrates cost growth trends. Charts 1 and 2 compare the current estimates of total program cost with initial and development estimates for weapon systems included in the selected acquisition reporting system with systems which are not included on Selected Acquisition Reports (SARs). Charts 3 and 4 present information on generic types of weapon systems, that is, land vehicles, missiles, and aircraft. You can see from these charts that the weapon program cost estimates grow substantially as the program progresses.

On balance today's military weapon systems acquisition process is characterized by programs which are extended, exceed original cost estimates, and encompass fewer units than originally planned. DOD attributes most cost growth to quantity increases to fill original objectives or new requirements and inflation. We do not disagree that these two factors are

significant contributors, but we would add that overoptimism in cost estimating transcends all the reasons cited by DOD for cost growth and, therefore, is the principal contributor to underestimates.

I will now proceed with the focus of the testimony and hopefully some suggestions we make today for improving the cost estimating and reporting processes will assist this Committee.

REPORTING

DOD's cost reports to the Congress need to be improved. Cost estimates are reported to the Congress through the SARs, unit cost exception reports, and the budget process. SARs are reports that present a comparison between DOD's current estimate, which should reflect the total acquisition cost of the latest approved program, and the development estimate, which reflects the baseline established when the program entered the full-scale engineering development phase of acquisition. The unit cost report focuses on weapon systems unit cost increases and must be submitted to the Congress when certain thresholds are breached.

Major concerns have been expressed by the Congress and its oversight committees for some time over the accuracy, timeliness, and completeness of DOD's reporting. We recently

completed an in-depth review of the DOD cost estimating process on seven selected weapon systems. Our report was released on May 24, 1984. We found that (1) SARs do not always reflect the latest anticipated program acquisition costs, (2) SARs do not always show total planned acquisition objectives, (3) important cost categories are not always reported in SARS, (4) costs are not always reported consistently in SARs, and (5) unit cost exception reports have not fully resolved the problem of the lack of current data reported to the Congress.

It is also difficult to compare the information in SARs with that in other budgeting and accounting reports provided to the Congress. A few examples illustrate some of these problems:

--The B-1 bomber baseline SAR estimate excludes certain costs, such as $300 million for flight simulators for pilot training, normally included in aircraft estimates.

--SARs do not include ammunition costs unless the ammunition is unique to a specific weapon system. This reduces comparability of the cost estimates for various systems.

--According to the Congressional Budget Office, cost estimates for some 13 systems in the December 1982 SAR excluded at least $40.8

billion in program costs reported elsewhere to the Congress.

In times of constrained resources it is more important than ever that the Congress and executive branch officials have the information they need to ensure that resources are being spent effectively and efficiently. Management and project reports, such as SARs, should be designed to ensure that program objectives are achieved and costs controlled. These reports must be timely, useful, and readily understood. Government financial systems should be designed to provide that information. Yet today's financial systems--not only in DOD, but throughout government--provide little of the reliable cost data essential to effectively monitor program execution, anticipate overruns, and provide a basis for future program and budget planning.

All too frequently, the results are the types of problems discussed here today--cost estimates which are unreliable, inconsistencies between budget requests and accounting reports, and an inability to compare planned budgets with actual costs and results. These problems exist in large part because DOD and other departments and agencies generally do not budget and account on the same basis. The absence of a consistent basis for reporting costs makes it difficult, if not impossible, to compare the costs of similar activities in the government.

An integrated financial system that budgeted and planned on the same basis could produce accurate, comparable, and readily understandable management reports, such as the sample project report below.

A Sample Project Report
Construction Of A Strategic Missile Submarine

Project Status As of 10/3/83

Phases	*Planned Cost*	*Actual Cost To Date*	*Estimate to Complete*	*Total Cost to Complete*	*Increase (+) Decrease (–) From Plan*	*Months Under (–) Over (+)*
Research and Development	*16*	*20*	*0*	*20*	*+4*	*+2*
Testing and Evaluation	*4*	*3*	*0*	*3*	*–1*	
Design	*10*	*11*	*0*	*11*	*+1*	*+1*
Procurement	*70*	*10*	*65*	*75*	*+5*	*+2*
	100	*44*	*65*	*109*	*+9*	

Funding Status As of 10/3/83

		Appropriation		*Obligations*	
Number	*Description*	*Date*	*Amount*	*Amount*	*Unobligated*
XXXX	*Research and Development Testing and Evaluation (FY 82)*	*10/81*	*20*	*20*	*0*
XXXX	*Research and Development Testing and Evaluation (FY 82 Supplemental)*	*2/82*	*3*	*3*	*0*
XXXX	*Shipbuilding and Conversion (FY 83)*	*10/82*	*10*	*10*	*0*
XXXX	*Shipbuilding and Conversion (FY 83 Supplemental)*	*4/83*	*1*	*1*	*0*
XXXX	*Shipbuilding and Conversion (FY 84)*	*10/83*	*70*	*35*	*35*
	Totals		*104*	*69*	*35*
	Current Estimate		*109*		
	Increase (+) Decrease (–)		*–5*		

This allows both managers and the Congress to quickly determine the:

--differences between actual cost and planned cost;
--defined project phases, such as research and development;
--estimated resources needed to complete the project;
--estimated cost of those resources for each phase of the project;
--expected start and completion date, or milestone, for each phase;
--funding sources for the project (which may come from several appropriations).

As the project progresses, it is possible, using such reports, to determine if the project is on schedule, within budget, and requires additional resources to complete.

We believe it is time for a major overhaul of financial management systems government-wide. An integrated financial system that planned, budgeted, and accounted on the same basis could produce accurate, comparable, and readily understandable management reports on programs, organizations, and projects to support both management and congressional decisionmaking. The benefits of such a system include

--the ability to compare planned with actual program and project costs,

--the ability to compare the costs of similar operations across the government,

--more accurate budget estimates based on actual past program and project costs,

--the ability to measure the input of cost and the output of performance, and

--increased accountability for the management of public funds.

Our assessment of the problems and our ideas on how we might proceed are discussed much more extensively in a two volume report currently in draft form. We hope this report will stimulate widespread discussion of these issues, leading to the consensus which will be needed if reform is to be successful.

DOD COST ESTIMATING

In our review of DOD's cost estimating process, we determined that DOD could have improved its cost estimating and reporting on the systems we reviewed by (1) improving its cost estimating guidance and basic data used for estimating, and ensuring stricter implementation of the guidance, (2) introducing more realism into the assumptions and methodologies used, and (3) making fuller use of the recommendations of its independent estimating groups. We found that DOD's reports to

the Congress need improvement and that DOD and the services have efforts underway to address some cost estimating issues.

DOD needs to clarify its cost estimating guidance and resolve conflicts in the guidance. We found conflicts between definitions, instructions, and guidance issued by the Office of the Secretary of Defense (OSD) and the services.

Improved guidance without strict implementation would be of little value. In addition to improving its guidance, DOD should ensure its implementation. Examples drawn from our sample weapon systems illustrate the problems of inconsistent estimate structure and inadequate estimate documentation--which would show how an estimate was developed--that result from poor implementation of existing DOD cost estimating guidance.

DOD must ensure its estimates are based on accurate data. Estimates are often based on contractor data that is sometimes overly optimistic. According to authors outside GAO this use of optimistic estimates results from an environment within the DOD community that pushes contractors, and those within DOD, to "sell" a program to the services and to the Congress. This is done by presenting an optimistic estimate to put the program in a favorable light.

Realistic assumptions and sound methodologies are essential ingredients to good estimates. Improvements are needed in the

consistency of inflation recognition and recognition of program risk.

DOD does not recognize inflation consistently. In some cases we found contractor inflation indexes were used to calculate inflation, and in others inflation was used as a device to hide other cost increases.

Cost estimates, whether done independently or by the program office, must be based on realistic assumptions, rather than the optimistic assumptions sometimes favored by DOD management. We found that cost estimators were instructed to use optimistic assumptions related to contractor profit, the construction schedule, and allowances for uncertainties. DOD has sometimes decreased its cost estimates to fit within the fiscal constraints of the service budgets, and has excluded relevant program costs from its estimates.

We also found that cost estimators base their estimates on the information available to them at the time, and assume that the system they are estimating will not experience typical changes in scheduling, funding, engineering, or the threat. Rather than assuming these changes will not occur, estimators should identify these changes, determine their probability, and increase the amount of their estimate by the probable magnitude of the changes.

Although OSD and the services have established independent cost estimating groups to help ensure that cost estimates are more reliable and valid, efforts by such groups have not always been effective. Independent cost estimators' recommendations to recognize increased program cost were sometimes not accepted by DOD decisionmakers, and those recommendations were validated as program costs increased over the life of the weapon system.

OSD and the services recognize the need to improve their cost estimating process, and as a result, they are continually taking steps to improve this capability. OSD, the Air Force, Navy, and Army each have efforts underway to improve their cost estimating practices. If implemented fully, these efforts should improve some of the weaknesses in DOD's cost estimating and reporting. For example, the Army has initiated an effort to incorporate in its estimates funding for technological risk for the early years of production, known as Total Risk Assessing Cost Estimate for Production (TRACE-P). This concept involves identifying and quantifying risks when a weapon system transitions from development to production, submitting the risk cost with the program estimate, and reserving funds to cover the expected cost of the uncertainty. This effort should result in more realistic cost estimates being developed in the Army and reported to the Congress.

In addition to the efforts underway in DOD, we believe improved guidance, use of more realistic assumptions and

estimating methodologies, and continued emphasis on the value of independent cost estimates would go far in improving the estimating process and in turn, the quality of information provided to decisionmakers. Our report contains detailed recommendations designed to assist DOD.

UNDERCOSTING THE FYDP

Historical data shows that DOD's FYDPs are consistently undercosted. The dramatic increases in the defense program since 1980 and the perception that the cost of these huge increases may continue to be significantly understated has become a serious concern to the Congress. I will highlight for the committee the findings and conclusions of our recently completed assessment of the undercosting problem, giving particular attention to the procurement of major weapon systems.

As I stated at the outset, a major contributing factor to undercosting is bias in DOD cost estimating practices which encourage optimistic cost assumptions, while excluding actual cost experience and the reality of the budgeting environment.

In analyzing the planned weapon systems cost versus actual total obligational authority provided for 97 major weapon systems during the course of FYDPs for 1963 to 1983, we found that the Congress must grant an average of 32 percent more

obligational authority in an effort to execute the plans. Even with the additional funding, the number of weapon systems which DOD is actually able to procure is less than anticipated.

Although Congress appropriated more than expected for these systems, DOD has been unable to purchase the planned quantities since 1970.

The dotted line in chart 5 represents the approximate amount of additional funding that would have been required to purchase the planned procurement quantities. In the dotted line, the actual cost is multiplied times the planned number of weapons systems. Since 1970, this pattern of receiving more money and purchasing fewer quantities has gotten progressively worse. As long as historical trends continue, Congress is likely to appropriate more current dollars and realize fewer quantities than proposed in Five Year Defense Plans for major weapon systems.

The gap between FYDP projected costs and actual costs has been growing. As a result, a cost growth wedge can be seen between the FYDP estimate (dashed line) and the Full Procurement Requirement (dotted line).

Both lines are based on the FYDP planned weapon system quantities. In the dashed line, the FYDP's estimated unit costs is multiplied times the planned quantities. The lines diverge because the actual costs exceed the planned costs.

COST ESTIMATING INCENTIVES

One aspect of the cost estimating problem involves the motivations within DOD for presenting optimistic estimates. Reports and articles written by authors outside of GAO state that DOD cost estimates are done in an atmosphere of optimism. A former Under Secretary of the Army stated in an article entitled Liar's Dice,

> "[Contractors] know their . . . proposal[s] are to be made to a set of people who have every incentive to believe an overoptimistic, barely credible technical, schedule, and cost commitment, and who have a reputation for rejecting conservative offerings."

An Air Force study indicates that cost estimators are provided organizational motivation to develop an estimate that can be used to advocate the new weapon system to DOD and the Congress. According to a Congressional Research Service report, DOD officials recognize that it is widely acknowledged that program costs are often purposely underestimated either because the contractors are lowering their cost estimates to win a contract with hopes of recovering costs on follow-on contracts (a practice known as "buying-in") or because DOD is forcing a program to fit available funding rather than providing the funding it takes to do the job.

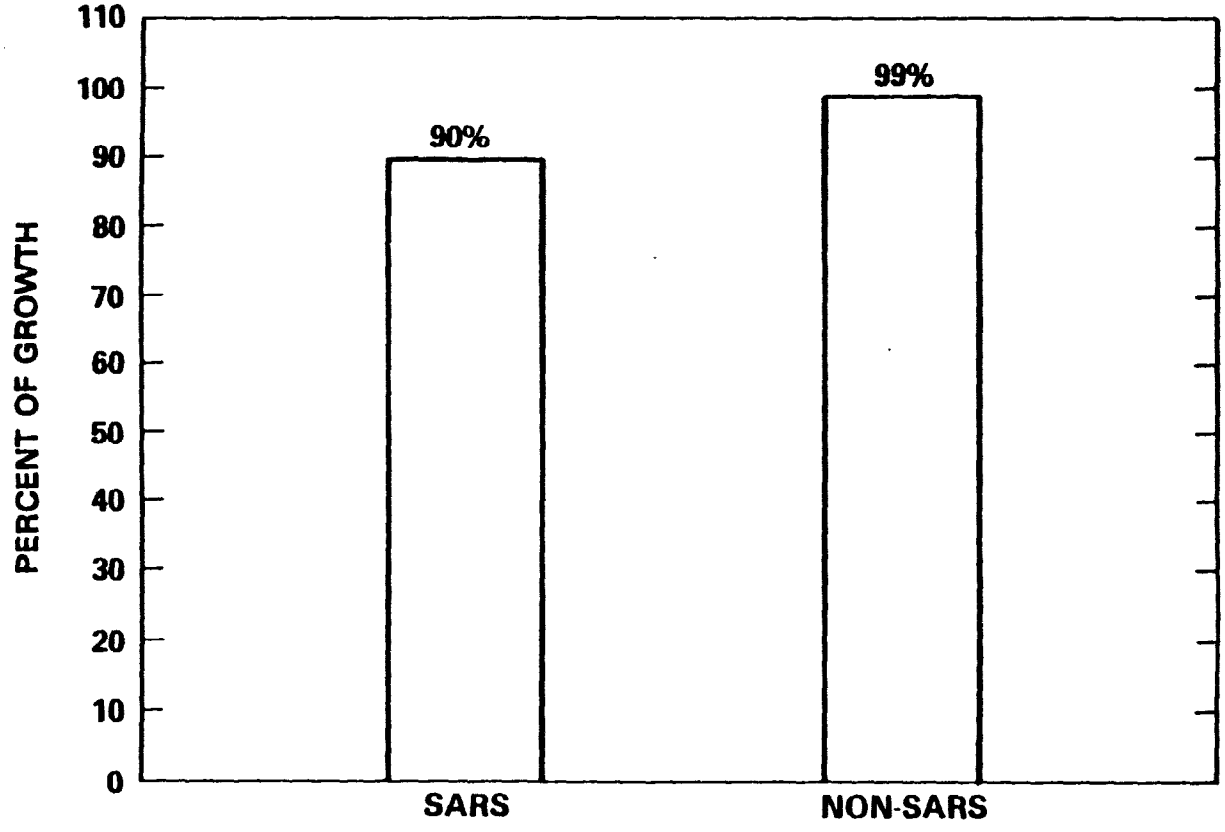
When estimators are encouraged to use optimistic assumptions regarding system design requirements, number of units, length of time for procurement, financial considerations regarding contractors, and so forth, it results in an overly optimistic estimate of what the system could cost if the acquisition strategy goes perfectly. However, history shows that system acquisitions rarely go according to plan--a myriad of influences determine their ultimate cost and performance. These influences have resulted in systems exceeding original and revised cost estimates.

One example from our May 24, 1984, cost estimating report illustrates that this problem sometimes involves the direction provided to cost estimators by DOD management.

On March 22, 1982, the Assistant Secretary of the Navy for Shipbuilding and Logistics issued guidance that the ship construction budget for fiscal year 1984 be repriced using less conservative estimating assumptions to produce a more optimistic estimate. The Assistant Secretary stated that high estimates were a self-fulfilling prophecy--estimates should be kept low to force constraints on contractors. The guidelines of the March 22 memorandum were not implemented, but the Navy did develop more optimistic estimating assumptions. These assumptions were incorporated in the April 9 guidelines used in the subsequent repricing of, and attendent $2.7 billion reduction in, the Navy's Five-Year Shipbuilding Plan.

Mr. Chairman, that concludes my prepared statement. I will be pleased to answer any questions you or your committee may have.

INITIAL ESTIMATES COMPARISON OF SAR/NON-SAR COST GROWTH RATE AS OF SEPTEMBER 30, 1983

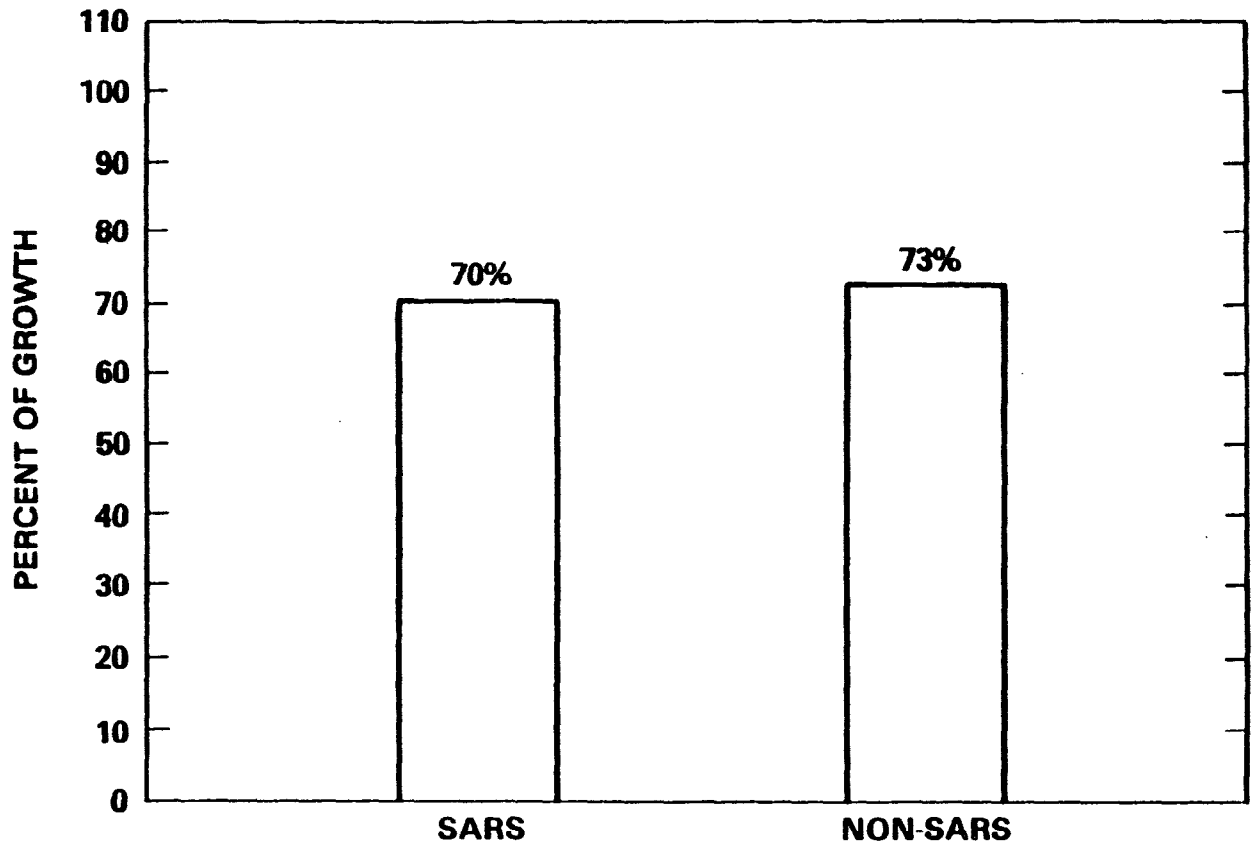


	SARS	NON-SARS
ACQUISITIONS:	73	86
CURRENT ESTIMATE:	$607	$195
INITIAL ESTIMATE:	$319	$ 98
INITIAL GROWTH:	$288	$ 97

(ALL DOLLARS IN BILLIONS)

CHART NUMBER 1

DEVELOPMENT ESTIMATES COMPARISON OF SAR/NON-SAR COST GROWTH RATE AS OF SEPTEMBER 30, 1983

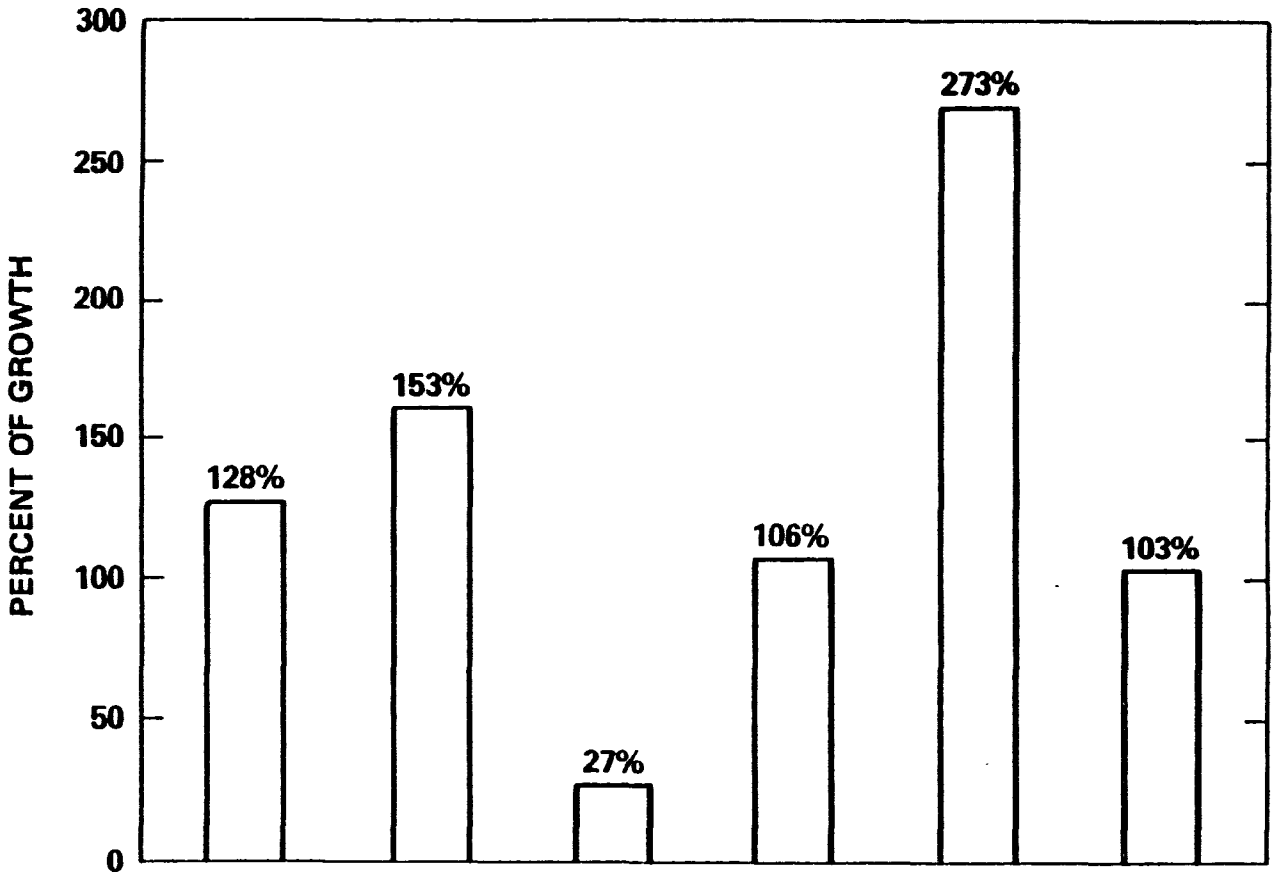


	SARS	NON-SARS
ACQUISITIONS:	73	86
CURRENT ESTIMATE:	$607	$195
DEVELOPMENT ESTIMATE:	$358	$113
DEVELOPMENT GROWTH:	$249	$ 82

(ALL DOLLARS IN BILLIONS)

CHART NUMBER 2

PERCENT OF INITIAL ESTIMATE COST GROWTH BY CATEGORY OF WEAPON SYSTEM AS OF SEPTEMBER 30, 1983

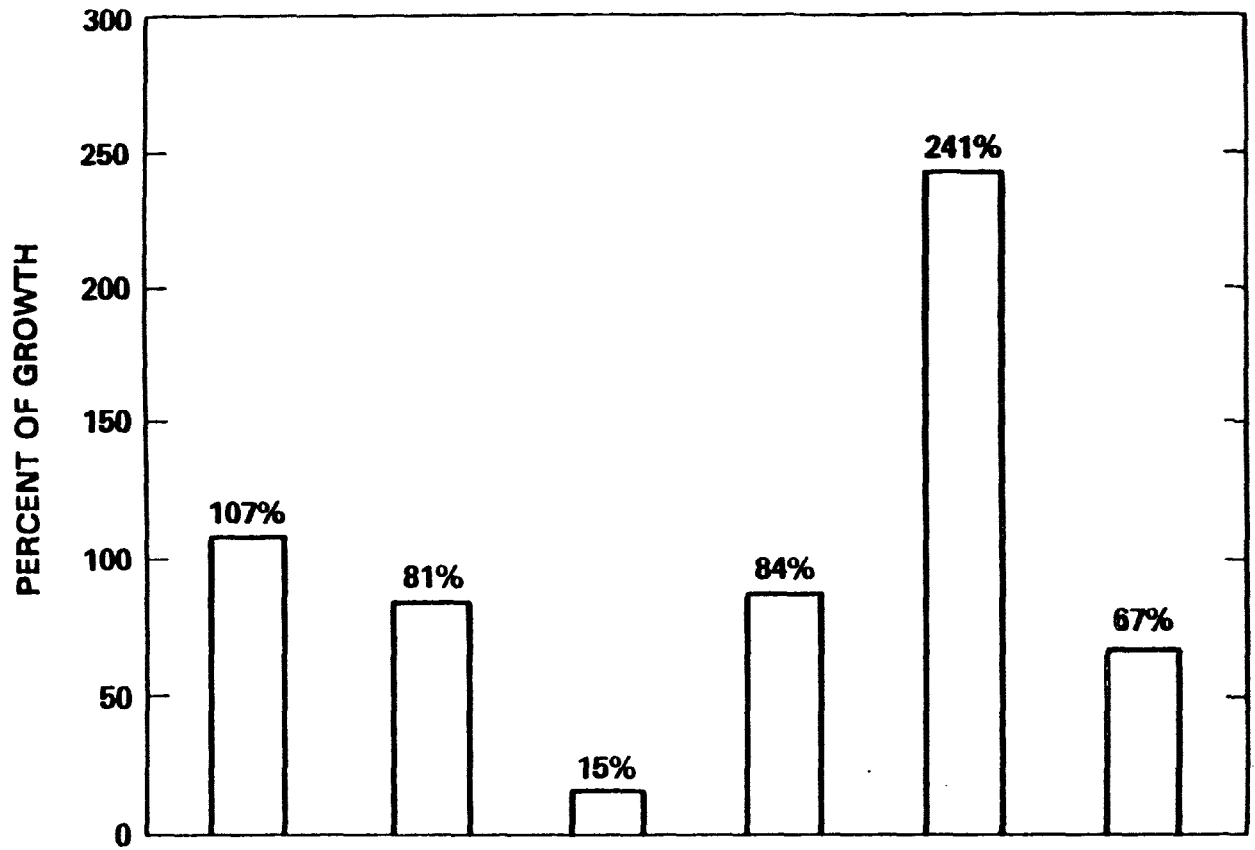


CATEGORY:	AIRCRAFT	HELICOPTERS	MISSILES	SHIPS	VEHICLES	OTHER
ACQUISITIONS:	28	9	41	24	10	47
CURRENT ESTIMATE:	$296	$38	$181	$171	$41	$75
INITIAL ESTIMATE:	$130	$15	$142	$ 83	$11	$37
COST GROWTH:	$166	$23	$ 39	$ 88	$30	$38

(ALL DOLLARS IN BILLIONS)

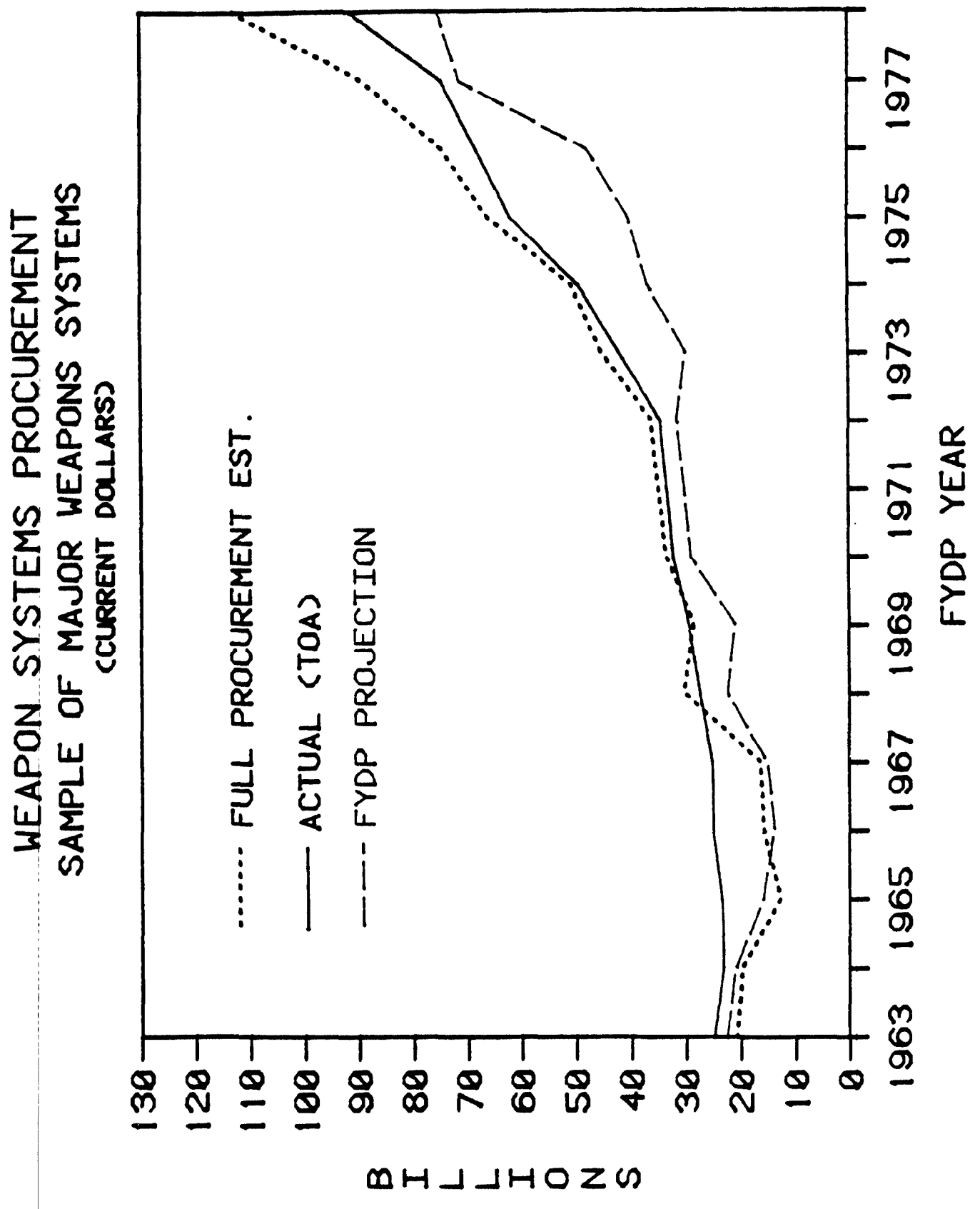
CHART NUMBER 3

PERCENT OF DEVELOPMENT ESTIMATE COST GROWTH BY CATEGORY OF WEAPON SYSTEM AS OF SEPTEMBER 30, 1983



CATEGORY:	AIRCRAFT	HELICOPTERS	MISSILES	SHIPS	VEHICLES	OTHER
ACQUISITIONS:	28	9	41	24	10	47
CURRENT ESTIMATE:	$296	$38	$181	$171	$41	$75
DEVELOPMENT ESTIMATE:	$143	$21	$157	$ 93	$12	$45
COST GROWTH:	$153	$17	$ 24	$ 78	$29	$30

(ALL DOLLARS IN BILLIONS)


WEAPON SYSTEMS PROCUREMENT
SAMPLE OF MAJOR WEAPONS SYSTEMS
(CURRENT DOLLARS)
..... FULL PROCUREMENT EST.
—— ACTUAL (TOA)
– – – FYDP PROJECTION
BILLIONS
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1963
1965
1967
1969
1971
1973
1975
1977
FYDP YEAR