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The Commission on Government Procurement recommended a new plan for acquiring major weapons systems and other major systems which has become the basis for a revised policy in procurement for all executive agencies. One program which the Department of Defense suggested came close to the recommended procedure is the Shipboard Intermediate Range Combat System, which has an estimated development cost of about \$500 million. Findings/Conclusions: To date, work on the System represents an important advancement in implementing the Commission's recommendations. Generally, this work is consistent with the Commission's intent, except that: cost goals have not been established as the Commission envisioned; restrictions have precluded or limited the participation of "smaller" companies; and only three alternative system concepts are being defined, because of limitations on funding and personnel. The Navy's planned approach, however, does not provide the extent of competition the Commission desired. Recommendations: Executive agencies have to understand that, under the new acquisition process, mission area deficiencies must be determined and stated independently of any specific system solution. Effort allowed under the technology base requires redefinition so that solutions to mission needs result from competition between alternative solutions. Industry must be given greater flexibility to propose a wide range of alternative solutions to mission area deficiencies in responding to Government requests. (Author/SC)

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# *REPORT TO THE CONGRESS*



*BY THE COMPTROLLER GENERAL  
OF THE UNITED STATES*

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## Comparison Of The Shipboard Intermediate Range Combat System With The Acquisition Plan Recommended By The Commission On Government Procurement

Department of Defense

The Commission on Government Procurement recommended a new plan for acquiring major weapons systems and other major systems which has become the basis for a revised policy in procurement for all executive agencies.

GAO has compared the Shipboard Intermediate Range Combat System with the Commission's plan and has found that work to date on the Shipboard Intermediate Range Combat System generally is consistent with the Commission's intent. The Navy's planned approach, however, does not provide the extent of competition the Commission desired.



COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20545

B-182956

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

This report on the Shipboard Intermediate Range Combat System is one of three reports on our review to determine how closely recent Department of Defense acquisition programs parallel the major system acquisition plan the Commission on Government Procurement recommended.

We made this review at the request of Senator Lawton Chiles, Chairman, Subcommittee on Federal Spending Practices, Efficiency, and Open Government, Senate Committee on Government Operations. As agreed with the Senator's office, we asked the Department of Defense to suggest systems for our review which came closest to the Commission's plan.

The NAVSTAR Global Positioning System and the Pershing II program are covered in separate reports. Of the three programs, only the Shipboard Intermediate Range Combat System had any significant similarity to the beginning steps of the Commission's plan.

We made our review pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

Copies of this report are being sent to the Director, Office of Management and Budget, and the Secretary of Defense.

A handwritten signature in cursive script, reading "James B. Stute".

Comptroller General  
of the United States

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## ABBREVIATIONS

ASCM	Advanced Anti-Ship Capable Missile
DCP	decision coordinating paper
DOD	Department of Defense
DSARC	Defense Systems Acquisition Review Council
GAO	General Accounting Office
LICGS	Lightweight Intermediate Caliber Gun System
OSD	Office of the Secretary of Defense
SIRCS	Shipboard Intermediate Range Combat System

COMPTROLLER GENERAL'S  
REPORT TO THE CONGRESS

COMPARISON OF THE SHIPBOARD  
INTERMEDIATE RANGE COMBAT SYSTEM  
WITH THE ACQUISITION PLAN  
RECOMMENDED BY THE COMMISSION  
ON GOVERNMENT PROCUREMENT  
Department of Defense

D I G E S T

In December 1972 the Commission on Government Procurement recommended a new plan for acquiring major systems. The Commission's recommendations were the basis for an April 5, 1976, Office of Management and Budget circular on major system acquisitions; it prescribed policy for all executive branch agencies.

GAO was asked to compare the beginning steps in the acquisition process of some recent major systems with the Commission's plan. (See p. 1.)

Because Department of Defense officials had indicated that the Commission's intent had been accomplished either formally or informally in some Defense programs, GAO asked Defense to suggest programs which came closest to the recommended procedures.

One suggested program is the Shipboard Intermediate Range Combat System which has an estimated development cost of about \$500 million. Production costs will depend on the system selected and the number of ships selected for installation of the system. A unit production cost goal of \$10 million or 10 percent of the ship's cost, whichever is greater, has been established.

The Navy project has two missions: anti-air and surface warfare. Its anti-air warfare mission is to defend ships against missiles and high performance aircraft. Its surface warfare mission is to destroy or neutralize surface craft and land targets to a specified range. (See p. 6.)

To date, work on the Shipboard Intermediate Range Combat System represents an important advancement in implementing the Commission's recommendations.

Generally, this work is consistent with the Commission's intent, except that:

- Cost goals have not been established as the Commission envisioned.
- Restrictions have precluded or limited the participation of "smaller" companies.
- Because of limitations on funding and personnel, only three alternative system concepts are being defined. (See p. 9.)

After the concept definition contracts, the Navy plans to validate the feasibility of only two concepts and then to fully develop only one system because of uncertain funding. Under the Commission's plan, systems would be eliminated from consideration based on content of proposals or on progress of development rather than on a predetermined funding estimate. (See pp. 18 and 19.)

The procedure used to coordinate data on threats and Office of the Secretary of Defense involvement in the project accomplished the intent of that portion of recommendation 1 by the Commission calling for agency head involvement before alternative system concepts are explored. However, the Secretary of Defense made no formal statement of needs and goals as envisioned by the Commission. (See pp. 10 and 11.)

Project documentation provided:

- A statement of the capability deficiency being addressed.
- Time, cost, 1/ and capability goals.
- Operating constraints, both environmental and self-imposed.
- Flexibility for contractors to propose their own technical approach and main design features. (See p. 16.)

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1/ Cost goals were provided, but they do not conform with the Commission's recommendations.

Project documentation stated the needs and goals independently of any specific system solution such as a missile, an anti-missile-missile, or an electronic countermeasures system. (See p. 11.)

GAO presented the results of its review of the three programs during August 24, 1976, hearings before the Subcommittee on Federal Spending Practices, Efficiency, and Open Government. GAO observed that implementation of the Commission's plan as outlined in the Office of Management and Budget circular will require improvements in several areas:

- Executive agencies have to understand that, under the new acquisition process, mission area deficiencies must be determined and stated independently of any specific system solution. This will enable agency heads and the Congress to make decisions based on a clear understanding of the mission deficiency and need for new systems.
- Effort allowed under the technology base requires redefinition so that solutions to mission needs are not dictated by in-house efforts but result from competition between alternative solutions.
- Industry must be given greater flexibility to propose a wide range of alternative solutions to mission area deficiencies in responding to Government requests.

Officials of the Office of the Secretary of Defense and the Navy agreed generally with the report. Comments of these officials have been incorporated.

## CHAPTER 1

### INTRODUCTION

Major system acquisitions account for a large portion of Federal expenditures. We reported 1/ in February 1976 that major Federal acquisitions 2/ in process as of June 30, 1975, would cost about \$404 billion at completion. About \$220 billion is for Department of Defense (DOD) acquisitions, excluding the Army Corps of Engineers.

In December 1972, after about 2-1/2 years of study, the Commission on Government Procurement issued its report containing 149 recommendations for improving Federal procurement. Twelve recommendations were on major system acquisitions. The Office of Federal Procurement Policy, Office of Management and Budget, issued Circular No. A-109, "Major System Acquisitions," on April 5, 1976. It prescribed policy for all executive branch agencies based on the Commission's recommendations.

During July 1975 hearings on major system acquisition reform, the Chairman, Subcommittee on Federal Spending Practices, Efficiency, and Open Government, Senate Committee on Government Operations, asked us to undertake a special study of the "very beginning steps" in the requirements process for some current programs. He asked that we compare the evolution of these programs with the Commission's recommendations.

DOD officials had indicated in congressional hearings that the intent of the Commission's plan had been implemented either formally or informally in some DOD acquisitions. Therefore, with agreement from the Senator's office, we asked the Deputy Secretary of Defense to suggest acquisitions which were managed in a way that most nearly corresponded to the procedures the Commission recommended.

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1/"Financial Status of Major Acquisitions, June 30, 1975," PSAD-76-72, dated February 27, 1976.

2/For civil agencies, acquisitions over \$25 million were considered major. For DOD, programs with research, development, test, and evaluation costs over \$50 million or production costs over \$200 million were considered major.

the Navy's Shipboard Intermediate Range Combat System (SIRCS), and (3) the NAVSTAR Global Positioning System, which has a joint service program office with the Air Force as the executive service. The Pershing II and NAVSTAR programs are the subjects of separate reports.

We presented the results of our review of the three programs during August 24, 1976, hearings before the Subcommittee on Federal Spending Practices, Efficiency, and Open Government. We observed that implementation of the Commission's plan as outlined in the Office of Management and Budget circular will require improvements in several areas:

- Executive agencies have to understand that under the new acquisition process mission area deficiencies must be determined and stated independently of any specific system solution. This will enable agency heads and the Congress to make decisions based on a clear understanding of the mission deficiency and need for new systems.
- Effort allowed under the technology base requires redefinition so that solutions to mission needs are not dictated by in-house efforts but result from competition between alternative solutions.
- Industry must be given greater flexibility to propose a wide range of alternative solutions to mission area deficiencies in responding to Government requests.

#### SCOPE OF REVIEW

Our review covered only the Commission's first six recommendations. To determine the evolution of the selected programs, we conferred with officials of military department headquarters, program offices, and selected contractors. We reviewed available correspondence; reports; briefing charts; contracting documents; and planning, programing, and budgeting system documents.

We did not evaluate the conclusions reached or decisions made in the programs' evolution. Rather, we compared the programs with the major system acquisition plan envisioned by the Commission and the Office of Management and Budget circular on major system acquisitions

Formal comments were not obtained from DOD on this report. However, OSD and Navy officials reviewed the report and were generally in agreement with its findings and conclusions. Comments of these officials have been incorporated.

## CHAPTER 2

### COMMISSION ON GOVERNMENT PROCUREMENT

The Commission on Government Procurement's recommendations on major system acquisitions called for:

- Establishing a common plan for conducting and controlling all acquisition programs. The plan should highlight the key decisions for all involved organizations: the Congress, agency heads, agency components, and the private sector.
- Defining each organization's role so it can exercise proper responsibility and control over acquisition programs.
- Providing the Congress and agency heads with the information needed to make key program decisions and commitments.

The plan forms a structure applicable to programs of all agencies. The recommendations were not designed to be selectively applied to the acquisition process but, rather, to be used together to improve the entire acquisition process.

Specific actions called for in the early stages of the process were:

- Agency components (such as the Army, Navy, and Air Force) would submit their perceptions of mission deficiencies to their agency head (such as the Secretary of Defense).
- The agency head would reconcile a perceived need with overall agency mission capabilities and, if there was agreement that a need existed, would (1) set initial cost, time, and capability goals and (2) direct one or more agency components to respond to the need.
- An agency component would establish a program office and solicit proposals from industry for conceptual solutions to the stated need.
- Industry would respond to the solicitation with proposed systems.
- The agency budget request and the congressional authorizations for front-end research and development

would be by mission purpose rather than by individual items.

- The agency head would allocate funds to the agency component for the proposed systems.
- The agency component would fund selected alternative systems using annual fixed-level funding, after reviewing their progress each year.
- Industry would explore 1/ the selected systems within the established funding goals.
- The agency component would choose systems for competitive demonstration on the basis of this exploration.

As an exception, agency head approval would be required if the agency component determined it should concentrate development resources on a single system.

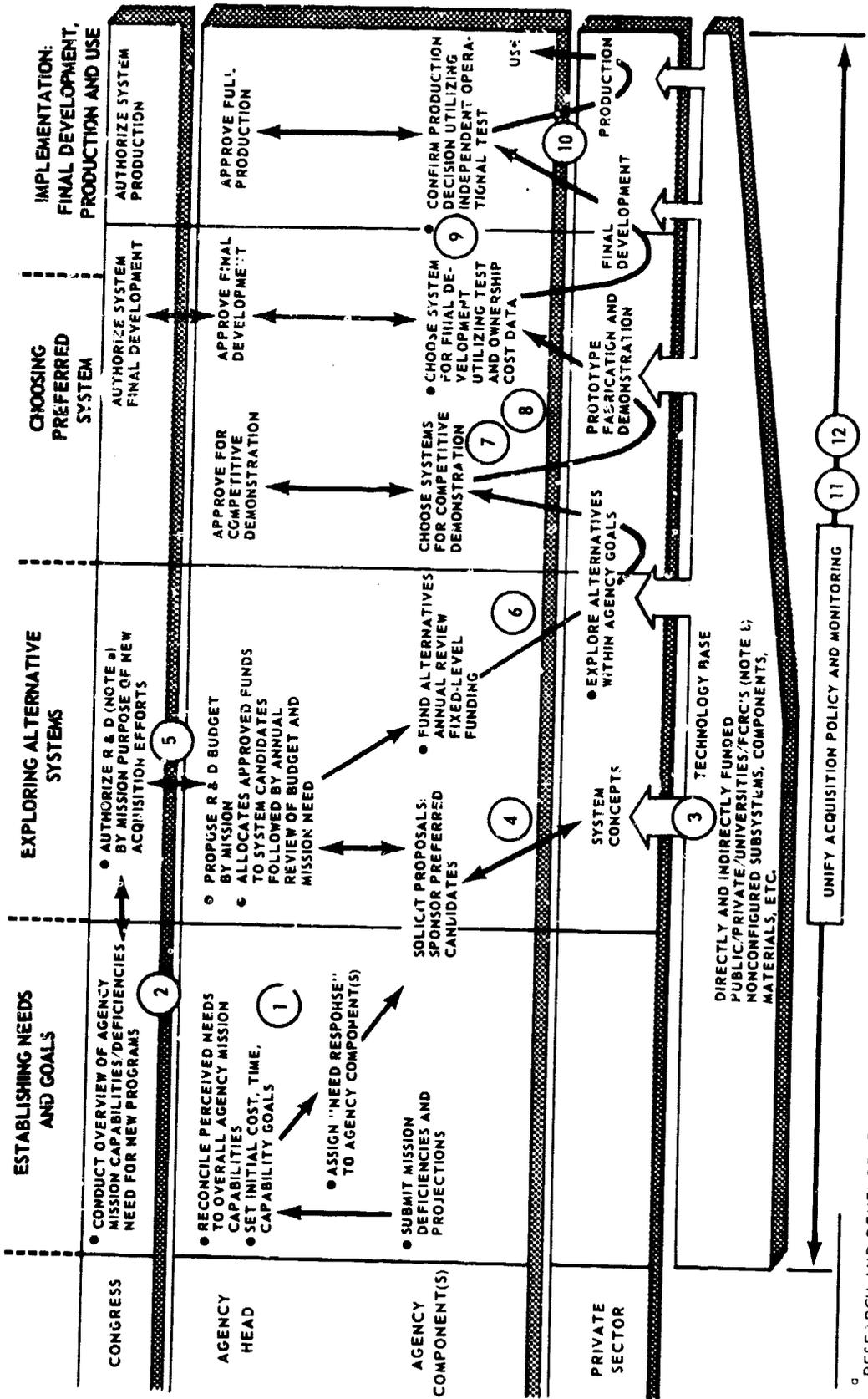
The following chart from the Commission's report shows the interaction of the Congress, agency heads, agency components, and the private sector in the recommended major system acquisition plan.

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1/As used by the Commission, "exploring alternative systems" includes the study, design, and development effort occurring between agency head direction for a component to respond to a need statement and the selection of systems for competitive demonstration.

# MAJOR SYSTEM ACQUISITION

## RECOMMENDED ACTIONS



## CHAPTER 3

### EVOLUTION OF THE SHIPBOARD INTERMEDIATE

#### RANGE COMBAT SYSTEM

The Shipboard Intermediate Range Combat System is a Navy project addressing two missions: anti-air and surface warfare. Its anti-air warfare mission is to defend ships against missiles and high-performance aircraft. Its surface warfare mission is to destroy or neutralize surface craft and land targets to a specified range. SIRCS began in 1975 after the Director, Defense Research and Engineering, had directed the merger of two prior programs with overlapping mission objectives: the Lightweight Intermediate Caliber Gun System (LICGS) and the Advanced Anti-Ship Capable Missile (ASCM) Defense System. (A summary of these programs is included as app. III.)

#### THE SIRCS MISSION

##### Anti-air warfare mission

The anti-ship missile threat (air, surface, land, and submarine launched) was recognized as early as 1964. Increased concern was brought about during 1967, when the Israeli destroyer Elath was sunk by a Soviet cruise missile. Since then, as shown in major planning documents, the Office of the Secretary of Defense and the Navy have recognized and agreed upon the seriousness of ship self-defense.

##### Surface warfare mission

In surface warfare, SIRCS is to destroy or neutralize surface craft and land targets to a specified range. Basically, two kinds of enemy ships pose the surface threat: (1) small, fast, highly maneuverable surface craft armed with conventional weapons and/or missiles and (2) large combatants with long-range conventional gun systems.

Shore bombardment is directed against land targets such as coastal defense gun sites, infantry companies, mortar batteries, surface-to-air missile sites, truck convoys, and bunkers. The surface warfare mission was not extensively discussed in the SIRCS operational requirement, but the Navy considers it important.

## SIRCS

In April 1975, the Anti-Ship Missile Defense Project Office of the Naval Sea Systems Command was assigned responsibility for the development and acquisition of SIRCS, and the SIRCS Project Office was established. On May 21, 1975, the Chief of Naval Operations issued the SIRCS operational requirement document which stated the problem SIRCS is addressing, independently of a predetermined solution. In June 1975, the Naval Sea Systems Command approved an advanced procurement plan which called for a competitive concept definition phase with industry submitting alternative solutions to the problem.

The Navy presented the SIRCS project to Defense Research and Engineering on August 14, 1975. As a result, Defense Research and Engineering issued a memo on August 15, 1975, which permitted a briefing to industry and allowed the Navy to release the draft request for proposal. The memo required that the Navy (1) present a program review to the Director at a later date and (2) prepare a draft decision coordinating paper (DCP) before awarding contracts to industry. Later the SIRCS Project Office released a request to industry for letters of interest and held an industry briefing on August 19, 1975.

On October 31, 1975, the Source Selection Plan was approved allowing industry to compete to define SIRCS. On the same day, the request for proposal was released to industry. It incorporated the SIRCS operational requirement document and was given to 21 companies the Navy considered qualified. It included three elements which warrant further comment: (1) the procurement strategy, (2) the stated award criteria, and (3) Government-furnished information. The procurement strategy stated:

"It is expected that up to four (4) cost type contracts will be awarded. The results of those contracts will be evaluated and it is expected that two (2) cost type contracts will be awarded for concept validation phase stage." (Underscoring provided.)

Industry submitted seven proposals and evaluation began on January 5, 1976. The award criteria favored those contractors who could produce a substantial portion of the system. Ten items of Government-furnished information were to be provided at a later date. (See app. I.)

### The SIRCS draft DCP

The SIRCS draft DCP was distributed to and reviewed by high-level Navy and OSD personnel. A revised draft was presented to OSD for comment in April 1976 before contracts were awarded. It contained:

- A description of the problem which led to SIRCS, including (1) the anti-ship missile, surface ship, and shore threats (2) anti-air warfare and anti-ship missile defense system limitations, and (3) surface strike warfare system deficiencies.
- An operational requirements section which stated needs and goals independently of any system product.
- Recognition of the Navy as the agency component responsible for developing SIRCS.

### SIRCS project status

On May 19, 1976, after evaluating the seven proposals, the Navy awarded contracts to McDonnell Douglas, Raytheon, and Radio Corporation of America. In June 1976, these contractors had just begun to define their concepts. This phase will continue for about 9 months, until the end of February 1977.

The normal program initiation decision following Defense Systems Acquisition Review Council (DSARC) I and an updated DCP are planned for about September 1977. The Navy plans to award concept validation contracts to two contractors. Dates of DSARC meetings for the full-scale development, limited production, and full-scale production decisions and the operational capability date are classified. Navy officials stated that they expect to award one full-scale development contract due to expected funding constraints.

Estimated development cost is about \$500 million, and a design-to-cost goal of \$10 million or 10 percent of the platform cost, whichever is greater, has been established. Actual production costs will depend on the system selected and the number of ships to receive the system.

See appendix II for a listing of the key events which occurred between December 1974 (when the Director, Defense Research and Engineering, directed that the LICGS and the ASCM Defense System programs be merged) and May 1976 (when the concept definition contracts were awarded).

## CHAPTER 4

### COMPARISON OF THE SIRCS PROJECT WITH THE BEGINNING STEPS OF THE COMMISSION'S ACQUISITION PLAN

Work on the Shipboard Intermediate Range Combat System project is a major advancement in implementing the Commission on Government Procurement's recommendations on major system acquisitions, although much was done informally. Exceptions noted are that:

- Cost goals have not been established as envisioned by the Commission. 1/
- Restrictions in pertinent documents have precluded or limited the participation of smaller companies.
- Only three alternative SIRCS concepts are being defined because of available funding and personnel.

In addition, current Navy plans for exploring alternatives are not consistent with the Commission's intent. Following sections compare SIRCS and the Commission's first six recommendations.

Only two recommendations (1 and 4) can be meaningfully compared with Navy efforts at this time. Implementation of recommendations 2, 3, and 5 would require changes in the Federal budgeting process and in Defense technology base efforts. These changes have not been made. Recommendation 6 covers a phase in the acquisition process beyond the current status of SIRCS.

#### STARTING AND COORDINATING PROGRAMS

"Recommendation 1. Start new system acquisition programs with agency head statements of needs and goals that have been reconciled with overall agency capabilities and resources.

- (a) State program needs and goals independently of any system product. Use long-term projections of mission capabilities and deficiencies prepared and coordinated by agency component(s) to set program goals that specify:

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1/See pp. 12 and 13 for a discussion of possible interpretation of "cost goals."

- (1) Total mission costs within which new systems should be bought and used.
  - (2) The level of mission capability to be achieved above that of projected inventories and existing systems.
  - (3) The time period in which the new capability is to be achieved.
- (b) Assign responsibility for responding to statements of needs and goals to agency components in such a way that either:
- (1) A single agency component is responsible for developing system alternatives when the mission need is clearly the responsibility of one component; or
  - (2) Competition between agency components is formally recognized with each offering alternative system solutions when the mission responsibilities overlap."

The Navy and the Office of the Secretary of Defense, either formally or informally, accomplished most of the intent of this recommendation. Exceptions concerned specifying (1) total mission costs within which new systems should be bought and used and (2) when SIRCS will become operational.

#### Agency head statement of needs and goals

The Commission stated that current DOD policy delegates the responsibility for defining needs and goals to the military services. The services usually define the kind of hardware they need instead of the kind of mission which needs to be performed. The result has been pressure to "lock in" to a single system, without adequately considering why a new level of capability is needed, before less costly system alternatives are created or eliminated. To overcome this problem, the Commission envisioned that agency components should submit their projections of long-term mission capabilities and deficiencies to the agency head for review. If in agreement, the agency head could proceed in accordance with the first recommendation.

OSD personnel reviewed the draft SIRCS decision coordinating paper and coordinated data on threats. The intent, therefore, of that portion of recommendation 1 calling for involving agency heads before exploring alternatives

was accomplished. However, the agency head made no formal statement of needs and goals as envisioned by the Commission.

After directing the merger of the Lightweight Intermediate Caliber Gun System and the Advanced Anti-Ship Capable Missile Defense System, the Director, Defense Research and Engineering, directed the Navy to present a program review and prepare a draft DCP before awarding concept definition contracts. The draft DCP was reviewed at various levels within OSD before the Navy awarded contracts for concept definition.

The data on threats was coordinated between the Navy and OSD. The draft DCP contained a statement on the anti-ship missile, surface ship, and shore threats that SIRCS is addressing. The anti-ship missile threat was expanded in two areas--near term and far term. The near-term, anti-ship missile threat is composed of numerous and diverse second-generation systems featuring submarine-, surface-, and air-launched anti-ship missiles. The surface threat spectrum is expected to include surface platforms with increased durability, high cruise speeds, and improved command and control capabilities. Other characteristics of the threats are classified.

The SIRCS operational requirement document stated the needs and goals relative to these threats independently of any specific solution such as a missile, an anti-missile-missile, or an electronic countermeasures system. The document called for:

"\* \* \* a total, modular combat weapon system capable of being scaled up or down for specific ship platforms \* \* \*. This system will provide a detection through engagement capability. This requirement should be met by a mix of sensor, weapons, command and control, electronic warfare and decoy sub-systems. New developments in each of these areas are not necessarily required or desired under this OR [operational requirement]. Rather, new sub-systems developments should be fully integrated with appropriate existing capabilities (or growth variations of present and planned systems) to obtain an optimum system capability and meet defined requirements."

Reconciliation against overall agency resources and capability

The Navy and OSD feel that OSD informally reconciled projected needs with overall agency resources and capabil-

ities during the regular DOD budgeting cycle. Since SIRCS began, presentations have been made several times to various Navy and OSD organizations as well as to congressional committees. No formal documentation was provided to show that such a reconciliation was made before SIRCS was started. Navy officials did, however, brief us on the mission area, showing the projection of future weapon systems and their self-defense capabilities. Therefore, the Navy data needed to make such a reconciliation was available.

#### Level of mission capability to be achieved

The draft DCP specified the capability needed above projected inventories and existing systems. It did this by describing the threats, as agreed upon by DOD and the Navy, as well as existing system deficiencies and the operational requirement.

#### Operational capability date

An initial operational capability date was included in the SIRCS operational requirement document. Navy personnel stated that the date reflects consideration of (1) the average time needed to bring a weapon system from proposal to initial operational capability, (2) an achievable date within projected funding levels, and (3) phasing SIRCS with current near-term programs. The date is not, therefore, based on a mission analysis, as desired by the Commission, to determine when the mission deficiency would first exist.

#### Mission cost goal

Recommendation 1 calls for the agency head to set a mission cost goal "within which new systems should be bought and used." No evidence we reviewed showed that this kind of goal was established for SIRCS. The draft DCP contains a design-to-cost objective of \$10 million per unit or 10 percent of the platform cost, whichever is greater. This does not include operating costs.

The Commission's recommendations do not define "mission cost goals," a phrase subject to different interpretations. One possible interpretation is a life-cycle-cost goal which would include development, production, operation, and retirement costs for the systems. A second interpretation would be a cost goal within which all operating or

planned systems making up a defined mission may be bought and used. 1/

We did not try to define "mission cost goal." However, the Office of Management and Budget circular on major system acquisitions speaks of cost objectives rather than mission cost goals. The circular emphasizes life-cycle cost. Developing life-cycle costs at such an early stage would require a knowledge of the system solution before exploring alternatives.

#### Use of long-term projections of mission capabilities and deficiencies

Recommendation 1 calls for project goals based on "long-term projections of mission capabilities and deficiencies." The draft DCP was based on a long-term projection of the threats and ships' abilities to defend themselves. It also defined current system deficiencies. For example, "current surface-to-surface gun systems are heavy, space-consuming, complex, and expensive; anti-air warfare missile systems have little or no surface-to-surface capability" and are easily saturated. (

#### Responsible agency component

OSD did not formally delegate responsibility to the Navy to develop SIRCS. The draft DCP, however, recognized the Navy as the single agency component responsible for developing system alternatives to satisfy the stated needs and goals of the operational requirement. Furthermore, the sea control mission, which includes ship self-defense, is the responsibility of the Navy.

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1/Program office officials stated that they believe the design-to-cost guidance (\$10 million or 10 percent of the platform cost) provided in the operational requirement document follows the Commission's intent in that it relates SIRCS to the level at which the mission is to be accomplished. That is, the SIRCS mission can only be accomplished in terms of a single shipboard platform. Further, they feel the goal provides contractors meaningful guidance and substantial flexibility for the exploration of alternatives.

## CONGRESSIONAL REVIEW OF NEEDS AND GOALS

"Recommendation 2. Begin congressional budget proceedings with an annual review by the appropriate committees of agency missions, capabilities, deficiencies, and the needs and goals for new acquisition programs as a basis for reviewing agency budgets."

The 1974 Congressional Budget Act requires that starting with fiscal year 1979, the President's budget request will contain descriptive information in terms of national needs, agency missions, and basic programs. The Congress has not yet been presented with a DOD budget by mission area. <sup>1/</sup>SIRCS has been presented as part of the fiscal year 1976 and transition quarter budget request and as part of the fiscal year 1977 budget request. Earlier, presentations were made to the Congress under LICGS and the ASCM Defense System. These requests were presented as individual items.

The Commission stated that the Congress cannot effectively review expenditures and the allocation of national resources without clearly understanding the needs and goals for new programs. It continued that the needs and goals for a program are presented to the Congress when a single system is proposed, with cost, schedule, and performance estimates often predicated on insufficient research and development. At this point, the cost to meet a mission need is largely determined by the cost of the new system, not the worth of the new mission capability compared to other alternatives.

The Congress should have an early opportunity to (1) understand and debate an agency's mission needs and goals for new acquisitions and (2) discuss the relationship of proposed mission capabilities to current national policy and the allocation of resources in accordance with national priorities. Moreover, the mission area format for budget requests, authorizations, and appropriations called for in recommendations 2 and 4 are an integral part of the approach recommended by the Commission. Budgeting by mission area will provide executive agencies the flexibility needed to carry out other portions of the recommended acquisition framework.

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<sup>1/</sup>We are reviewing research and development budget formulation. The objective is to compare actual budget formulation for selected projects in various executive agencies with the Commission's recommendations affecting budget formulation. Our target reporting date is January 1977.

## TECHNOLOGY BASE

'Recommendation 3. Support the general fields of knowledge that are related to an agency's assigned responsibilities by funding private sector sources and Government in-house technical centers to do:

- (a) Basic and applied research.
- (b) Proof of concept work.
- (c) Exploratory subsystem development.

Restrict subsystem development to less than fully designed hardware until identified as part of a system candidate to meet a specific operational need."

The Commission sought to make the technology base better serve new programs by (1) controlling how far development efforts are taken within technology base funding and justification and (2) giving the technology base greater access in offering new system candidates.

Because this recommendation is aimed toward DOD-wide activity rather than toward individual major system acquisition programs, we did not assess DOD's implementation efforts.

## CREATING NEW SYSTEMS

"Recommendation 4. Create alternative system candidates by:

- (a) Soliciting industry proposals for new systems with a statement of the need (mission deficiency); time, cost and capability goals; and operating constraints of the responsible agency and component(s), with each contractor free to propose system technical approach, subsystems, and main design features.
- (b) Soliciting system proposals from smaller firms that do not own production facilities if they have:
  - (1) Personnel experienced in major development and production activities.
  - (2) Contingent plans for later use of required equipment and facilities.

- (c) Sponsoring, for agency funding, the most promising system candidates selected by agency component heads from a review of those proposed, using a team of experts from inside and outside the agency component development organization."

The Navy, and particularly the SIRCS Project Office, successfully implemented major portions of this recommendation. The SIRCS operational requirement document, which was incorporated into the request for proposal by reference, provided:

- A statement of the capability deficiency being addressed.
- Time, cost, 1/ and capability goals.
- Operating constraints, both environmental and self-imposed.
- Flexibility for contractors to propose their own technical approach and main design features.

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1/Cost goals were provided, but they do not conform with the Commission's recommendations. (See pp. 12 and 13.)

The Navy did not conform with the Commission's recommendations concerning:

- Cost goals.
- Soliciting system proposals from smaller firms.
- Using experts from outside the agency component development organization to evaluate proposals.
- Sponsoring the most promising candidates for agency funding.

### Cost goals

The SIRCS design-to-cost goal was the only cost goal established. It does not include operating costs for the system. Project Office officials stated that competing contractors will develop life-cycle-cost estimates which will serve as a basis for more detailed cost goals. Under the Commission's framework, unit cost goals, such as design-to-cost and life-cycle cost goals, would not be established this early in the acquisition process.

### Participation of smaller companies

The August 19, 1975, request for letters of interest restricted bidders to those capable of producing a "significant portion of the complete SIRCS system." In addition, the request for proposal contained evaluation criteria which included the contractor's prior experience with weapon systems, including production. This consideration favored companies which could produce SIRCS. Consequently, smaller firms without production capabilities, especially those concentrating on conceptual design, were essentially eliminated from contention unless they teamed with a production-oriented company.

The Commission felt that smaller firms should be able to compete in the design of major systems. The Commission's report stated that (1) large, established firms tend to acquire technical biases based on their experience with successful products and their customers' tastes and (2) smaller, growing firms are likely to have more initiative and innovative technical approaches for new systems.

Use of experts from outside  
the agency component  
development organization

The Commission recommended using a team of experts from inside and outside the agency component development organization for evaluating alternative systems. The Commission felt military services become advocates of specific methods and approaches based on past experience. Ultimately, more objective selection and exploration of alternative systems needs to be insured. The SIRCS concept development proposals were evaluated by personnel from various Navy organizations. SIRCS has not used experts outside the Navy.

Early SIRCS documentation such as the Advanced Procurement Plan and the Management Plan emphasized the use of Navy teams for evaluating concept definition proposals. In November 1975, however, the SIRCS Project Office requested a meeting with the Joint Logistics Command to discuss Army and Air Force participation in the SIRCS evaluation. Because the Navy Secretariat to the Joint Logistics Command felt this was an internal Navy problem, the request was denied. Project Office personnel did not pursue the request further, apparently, because of higher priority requirements. No effort was made to obtain the assistance of experts from outside DOD, such as from the National Aeronautics and Space Administration, the educational community, or industry. The Navy tentatively plans to evaluate the proposals for validating the SIRCS concepts in the same manner as the proposals for defining them. Use of experts from outside the Navy is being considered and will depend on availability, funding, and the technical content of the concepts to be evaluated.

Sponsoring promising system candidates

The early plan to select a maximum of four contractors to define SIRCS concepts was made because of resource limitations--monetary and personnel. Only three contracts were awarded. <sup>1/</sup> The Navy plans to award contracts to validate two of the SIRCS concepts. A plan calling for a specific

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<sup>1/</sup>Navy officials stated that the reduction to only three contracts resulted because a congressional budget authorization committee voted to authorize no funding for fiscal year 1977. This action occurred at a critical time in the selection process and caused the Navy to limit the award to the maximum number that could be funded with existing resources.

number of contracts before proposals have been evaluated is inconsistent with the Commission's intent. The Commission's report states that during the low-cost conceptual phase of a major system acquisition, competition should be maintained. Under the Commission's framework, candidate systems would be eliminated from consideration based on the content of their proposals or on the progress of their development rather than on a predetermined funding estimate. It should be noted, however, that available funding will always be a constraint on the number of alternatives which an agency can explore.

#### CONGRESSIONAL REVIEW OF SYSTEM EXPLORATION

"Recommendation 5. Finance the exploration of alternative systems by:

- (a) Proposing agency development budgets according to mission need to support the exploration of alternative system candidates.
- (b) Authorizing and appropriating funds by agency mission area in accordance with review of agency mission needs and goals for new acquisition programs.
- (c) Allocating agency development funds to components by mission need to support the most promising system candidates. Monitor components' exploration of alternatives at the agency head level through annual budget and approval reviews using updated mission needs and goals."

The SIRCS project has been financed according to current appropriation procedures. Funds have been requested in the advanced development section of the Navy's research, development, test, and evaluation budget under Missiles and Related Equipment Activity. Requests were presented to the Congress as individual items.

The Commission stated that:

"Congress has difficulty overseeing the growing expenditures for agencies' R&D [research and development] budgets; its intensified demands for information and justification leaves Congress burdened with detailed reviews that obscure the overall pattern."

The Commission added that the Congress could better understand where research and development money is spent if it reviewed, authorized, and appropriated funds for exploring

candidate systems according to mission. This approach would segregate funds for (1) maintaining the technology base, (2) exploring alternative solutions to mission needs, and (3) the final development of systems.

Specific advantages listed for this approach were (1) reduced pressure to make premature commitments to a particular system in order to gain funding approval, (2) greater executive branch flexibility to explore alternative systems and to cope with uncertain systems, and (3) more effective congressional review of major system acquisition programs.

Previous comments under recommendation 2 apply to this section also. Budget requests, authorizations, and appropriations have not been made by mission area.

#### REINSTATING MEANINGFUL COMPETITION

"Recommendation 6. Maintain competition between contractors exploring alternative systems by:

- (a) Limiting commitments to each contractor to annual fixed-level awards, subject to annual review of their technical progress by the sponsoring agency component.
- (b) Assigning agency representatives with relevant operational experience to advise competing contractors as necessary in developing performance and other requirements for each candidate system as tests and tradeoffs are made.
- (c) Concentrating activities of agency development organizations, Government laboratories, and technical management staffs during the private sector competition on monitoring and evaluating contractor development efforts, and participating in those tests critical to determining whether the system candidate should be continued."

Contractors are just now defining alternatives for the SIRCS mission need; therefore, exploration of alternative systems has just started. The Navy's planned approach for exploring alternative systems will limit competition to a very few alternatives at a very early stage in the acquisition process. The Navy's plans do not provide the extent of competition or provide competing alternatives for as long as the Commission desired.

The Navy has already limited the alternative systems being defined to three. (See p. 8.) Further, it plans to award only two contracts to validate the defined systems and only one contract for subsequent development.

This is not what the Commission intended. The Commission favored additional research and development expenditures to initiate competition before system options were eliminated. This is when costs are much lower than those that must be incurred for full-scale engineering development. It felt that: "Competition should be continued at least up to the final development phase to provide a sound basis for choosing a potential system \* \* \*."

Comments in the Commission's report which conflict with the Navy's planned approach are:

--"Systems \* \* \* defined early and subjected to a short industry competition to select the contractor and remaining design refinements invariably have led to technical problems and contractual difficulties. The resulting procurement climate has been clouded by buy-ins, contentious awards, and contracts that were subject to so many changes and claims as to invalidate the integrity of original contractual agreements."

\* \* \* \* \*

--"Competitive demonstration of new systems is not appropriate for all programs, but the decision to forego competition should consider more than short-term savings in time and money. The added expenditure of R&D [research and development] monies to bring a wider span of system solutions into competition can be expected to have a great leverage effect on ultimate system performance and on the vast majority of program costs that will be incurred later."

\* \* \* \* \*

--"Looking at the past and to the future, no new programs automatically can or cannot afford competitive demonstration as a basis for choosing a preferred system. It is deceiving to say from the outset that any systems which might meet an agency need must, of necessity, be big and expensive and, therefore, not amenable to prototype demonstration. The necessity for bigness comes about mainly because of familiarity with the scale and scope of past systems used to

meet comparable agency needs. With a wide range of system candidates and technologies opened up by earlier recommendations, smaller and cheaper systems will have a chance to be brought forward."

It should be noted again, however, that agencies will always be constrained in the number of alternatives they can pursue by their available funding.

DESCRIPTION OF GOVERNMENT-FURNISHED INFORMATION

1. Operational Requirement Expansion--details requirements, provides a basis for weapon performance trade-offs, and discusses costing philosophy.
2. Threat and Target Baseline--describes representative threats and targets to be used in SIRCS design and in predicting system performance.
3. Environment Baseline--identifies and defines certain physical environmental factors, discusses electromagnetic compatibility requirements, and includes a discussion of related military standards.
4. Platform Baseline--describes the flow of command and physical and other characteristics of representative ships which are candidates to receive SIRCS.
5. Fleet Weapon System Baseline--details all elements of surface- and air-related combat systems projected for the fleet. 1/
6. Fleet Composition Baseline--lists ships and combat systems planned to be in service. 1/
7. Cost Analysis Guide--provides common definitions, assumptions, and formats for contractor cost analysis. The Cost Analysis Guide focuses on "design-to-cost" and "life-cycle-cost" concepts and emphasizes the importance of cost.
8. Scenario Baseline--is a set of detailed scenarios for use in comprehensive evaluation of proposed systems.
9. Navy T&E [test and evaluation]/Target/Range Resource Baseline--describes test and evaluation resources available for concept validation and full-scale development of SIRCS.
10. GFI [Government-furnished information] Library--includes additional relevant information and regulations and will be updated periodically.

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1/Period covered by data is classified.

SIRCS--MAJOR EVENTS

December 1974	LICGS and ASCM Defense System merged into SIRCS by the Director, Defense Research and Engineering.
Apr. 10, 1975	SIRCS project management assigned to Naval Sea Systems Command, Anti-Ship Missile Defense Project Office.
Apr. 23, 1975	Management and procurement strategy presented to the Director.
May 21, 1975	Operational Requirement issued by the Chief of Naval Operations.
June 9, 1975	Advance Procurement Plan approved by Commander, Naval Sea Systems Command.
July 1, 1975	Assistant Secretary of the Navy, Research and Development, briefed on SIRCS.
Aug. 14, 1975	Principal Deputy Director, Defense Research and Engineering, provisionally endorsed SIRCS project.
Aug. 15, 1975	Letter issued by Director which requires SIRCS project review and draft decision coordinating paper in January 1976.
Aug. 19, 1975	Briefing given to industry.
Oct. 31, 1975	Request for proposal released.
Oct. 31, 1975	Source Selection Plan approved by the Source Selection Authority.
Nov. 21, 1975	Preproposal conference held.
Dec. 19, 1975	Industry proposals received.
Jan. 5, 1976	Proposal evaluation began.
February 1976	Budget hearings--House Committee on Armed Services.
Mar. 17, 1976	Budget hearings--Senate Committee on Armed Services.

APPENDIX II

APPENDIX II

- Mar. 20, 1976 House Committee on Armed Services Report recommends elimination of SIRCS.
- Apr. 26, 1976 Decision coordinating paper sent for informal review by various assistant secretaries of Defense.
- May 19, 1976 Concept contracts awarded to McDonnell Douglas, Raytheon, and Radio Corporation of America.

PROGRAMS WHICH LED TO THE  
SHIPBOARD INTERMEDIATE RANGE COMBAT SYSTEM

LIGHTWEIGHT INTERMEDIATE CALIBER GUN SYSTEM

The First Navy Gunnery Conclave, convened in August 1968, proposed the first gun solution for anti-ship missiles that we could identify. It concluded, among other things, that four new gun systems were required, including an automatic, high-rate-of-fire gun system for close-in defense against cruise missiles and low-flying aircraft. The Navy Technical Development Plan for Naval Guns and Gun-Launched Weapon Systems, published in April 1970, also recommended a gun system. In June 1971, the Navy proposed a gun system to defend against anti-ship missiles. No evidence we reviewed shows that this proposed system was approved for funding.

In 1973, a draft technology coordinating paper concluded that an anti-ship missile defense system was needed. It discussed the then current naval gunnery projects addressing this problem, including a new, lightweight, intermediate-caliber, high-performance gun system incorporating many innovations. According to the paper, this project was being funded as shown below.

<u>Type funding</u>	<u>Fiscal year</u>	
	<u>1973</u>	<u>1974</u>
Exploratory development	\$670,000	\$1,000,000
Advanced development	-	500,000

The June 30, 1973, Naval Ordnance Systems Command's "Advanced Systems Concepts" for fiscal year 1974 proposed this gun system, with changes, for funding. During fiscal years 1973 and 1974, an experimental prototype of a 3-inch, expendable-breech gun was designed, fabricated, assembled, and tested. Some work was also done on the ammunition and fire control systems for this gun during the same period.

A technical development plan for LICGS in July 1974 included essentially the same features discussed earlier. In September 1974, a draft operational requirement document was prepared. At about the same time, a project master plan was developed which essentially involved the same gun system. The Navy planned to have the concept defined in-house followed by competitive contracting. Finally, in December

1974, as the result of a budget cycle review, and because of concern over the potential duplication of effort, the Director, Defense Research and Engineering, directed that LICGS be consolidated with the ASCM Defense System.

#### ADVANCED ANTI-SHIP CAPABLE MISSILE DEFENSE SYSTEM

Early in 1966, the Chief of Naval Operations directed that a cost-effectiveness analysis be made of systems for ship self-defense, including guns, unguided rocket systems, and guided missile systems. The analysis was to determine the most efficient combination of weapon systems for the 1970s.

The resultant report was basically an in-house study which proposed an advanced defense system using a new guided missile. The kinds of guidance and detection systems recommended are classified. Research, development, test, and evaluation costs at this time were estimated at about \$200 million. Based on the above study, work was done on war-head lethality, fuzing, and guidance. This and further planned work was terminated when funding was not approved for fiscal year 1970.

A program for an advanced defense system was again proposed in May 1971. The title was changed to the Close-In Self-Defense System and the proposal was restricted to a missile system. The following year, it was modified to include a missile and a gun, and was resubmitted. In February 1973, it was again updated and resubmitted. In March 1973, the Chief of Naval Operations asked for a proposal for advanced development. An anti-ship missile defense system was proposed in June 1973 by the Naval Ordnance Systems Command, and the Chief of Naval Operations directed that work begin on formulating such a program.

In February 1974, work was begun on an operational requirement for the then named Advanced Anti-Ship Capable Missile Defense System. A plan to develop an advanced ship-board gun system was published in July 1974. It included a volume on the ASCM Defense System. The system was described as incorporating a vertical launch missile, a high-rate-of-fire gun, a multipurpose launcher, and a weapons control system. It further described each subsystem in detail.

The Chief of Naval Operations never issued the operational requirement document for the ASCM Defense System. At the direction of the Director, Defense Research and Engineering, during a December 1974 budget review, the ASCM Defense System and LICGS efforts were merged, and the SIRCS project began.

PRINCIPAL OFFICIALS  
RESPONSIBLE FOR MATTERS  
DISCUSSED IN THIS REPORT

Tenure of Office  
From                      To

DEPARTMENT OF DEFENSE

SECRETARY OF DEFENSE:

Donald H. Rumsfeld	Nov. 1975	Present
William P. Clements, Jr. (Acting)	Nov. 1975	Nov. 1975
James R. Schlesinger	July 1973	Nov. 1975
William P. Clements, Jr. (Acting)	May 1973	July 1973
Elliot L. Richardson	Jan. 1973	May 1973
Melvin R. Laird	Jan. 1969	Jan. 1973

DEPUTY SECRETARIES OF DEFENSE:

Robert Ellsworth	Dec. 1975	Present
William P. Clements, Jr.	Jan. 1973	Present
Kenneth Rush	Feb. 1972	Jan. 1973
Vacant	Dec. 1971	Feb. 1972
David Packard	Jan. 1969	Dec. 1971

DIRECTOR, DEFENSE RESEARCH AND ENGINEERING:

Malcolm R. Currie	June 1973	Present
John S. Foster, Jr.	Oct. 1965	June 1973

SECRETARY OF THE NAVY:

J. William Middendorf II	June 1974	Present
John W. Warner	May 1972	Apr. 1974
John H. Chafee	Jan. 1969	May 1972