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U.S. GENERAL ACCOUNTING OFFICE

STAFF STUDY

[CVAN-68/69 AND CVN-70 NUCLEAR AIRCRAFT CARRIERS]

DEPARTMENT OF THE NAVY

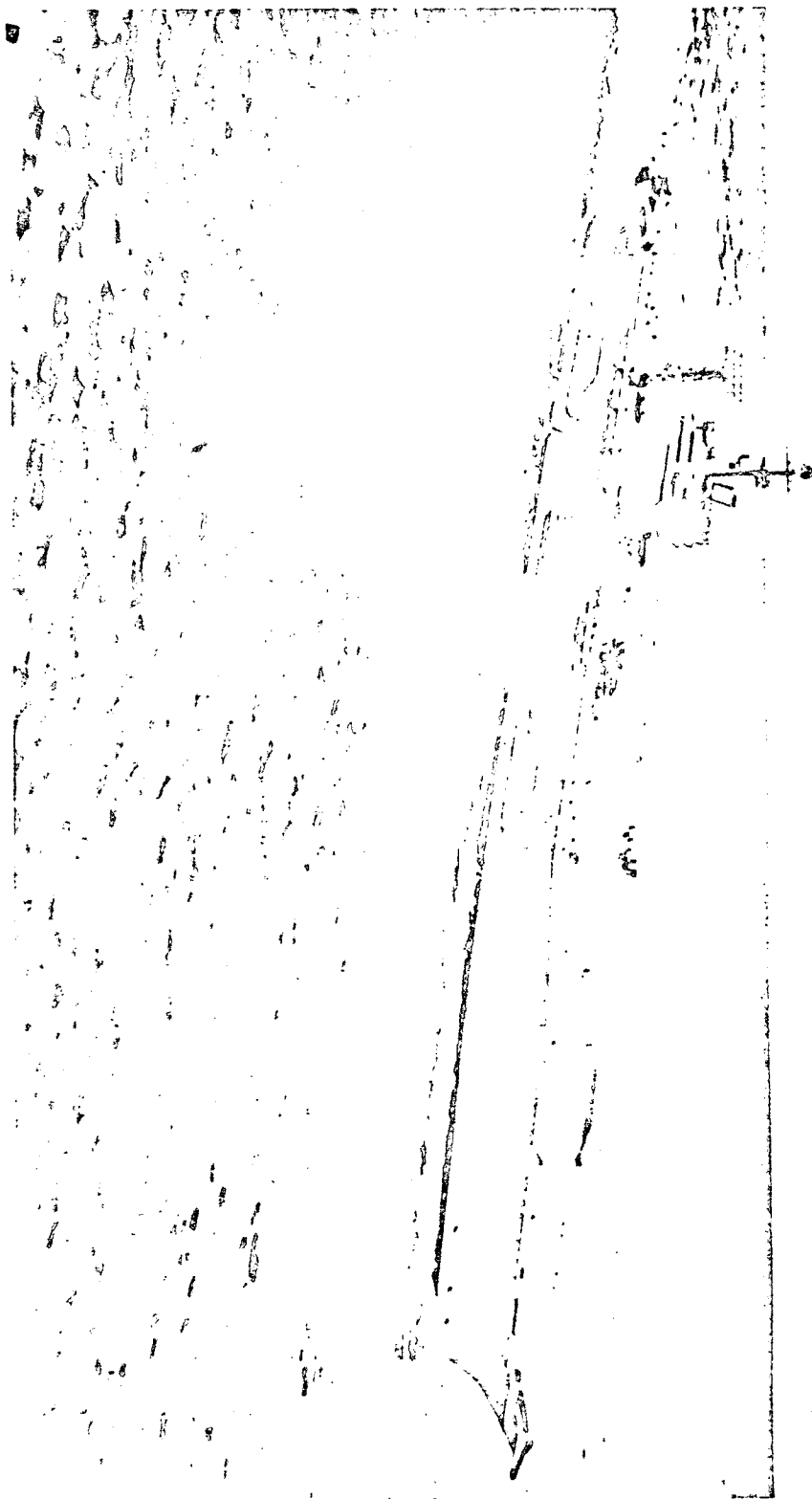
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A B B R E V I A T I O N S

AEC	Atomic Energy Commission
CGN	Nuclear-powered guided missile cruiser
CVAN	Nuclear-powered attack aircraft carrier
CVN	Nuclear-powered attack aircraft carrier with anti-submarine warfare capability
DLGN	Nuclear-powered guided missile frigate
DOD	Department of Defense
GAO	General Accounting Office
Newport News	Newport News Shipbuilding and Dry Dock Company
SAR	Selected Acquisition Report

CVAN 68/69 AND CVN 70
NUCLEAR POWERED AIRCRAFT CARRIERS
DEPARTMENT OF THE NAVY

SUMMARY

System description and status

The NIMITZ Class, CVAN 68/69 and CVN 70, is a class of nuclear powered aircraft carriers which can support and operate aircraft to engage in attacks on targets in the air, afloat, and ashore which threaten our use of the sea and to engage in sustained operations in support of other forces. As of June 30, 1973, CVAN 68/69 were under construction, and procurements for long lead time items of Government furnished equipment and contractor furnished equipment for CVN 70 have been awarded.

Coming events

The exercise of the contract option for construction of CVN 70 is planned for the last quarter of fiscal year 1974.

Cost

The June 30, 1973, program cost estimate for the three carriers of \$2,309.8 million is \$993.6 million more than the June 30, 1972, estimate. The primary reason for the increase is the addition to the program of the CVN 70 at an estimated cost of \$972.0 million.

Performance

There have been no changes in key performance characteristics of either the CVAN 68 or CVAN 69 since the planning estimate. The CVN 70

will be essentially identical with these carriers except for those minor changes necessary to accommodate the latest model aircraft when the CVN 70 is delivered.

Schedule

The delivery date for CVAN 68 of September 29, 1973, was not met. As of December 1973 the Navy anticipated a delivery date of about September 1974. Additional progress in the grooming and testing phase must be made before definitive target dates for the ship tests and trials can be established. The CVAN 69 target dates will be revised commensurate with the CVAN 68 progress. These slippages will not have any effect on the September 1980 delivery date of the CVN 70.

Relationship to other systems

The Navy's program for the nuclear-powered guided missile frigate (DLGN-38 class) is closely related to the Navy's program to acquire nuclear aircraft carriers. The Navy planned to have four DLGN's for each nuclear carrier with the possibility that a nuclear-powered guided missile cruiser (CGN) could be substituted for a DLGN.

As of June 1973, the Navy had two DLGN's and one CGN in operation, and five DLGN's under construction. Considering the Navy's plans to provide four DLGN's to escort each nuclear carrier, the Navy will provide four ships less than its stated needs for the three nuclear carriers in use or under construction. This shortfall will be increased

to eight since the Congress has authorized and appropriated funds for the construction of a fourth carrier (CVN 70).

In discussing carrier escort plans with the Office of Secretary of Defense and Navy officials, we were advised that the current plan is to make do with nuclear-powered escorts in the fleet and under construction, and to utilize conventional powered escorts to provide the remaining escort needs. This in effect is an application of the hi-low mix of forces and weapon systems that is becoming more prevalent in DOD pronouncements recently. We were not permitted to review the current plan because, as explained to us, the information contained therein is not considered final and may be subject to further changes.

Matters for consideration

The question is still open regarding the Navy's plan to provide nuclear escorts for its nuclear carriers. As we have reported in our past staff studies, much uncertainty has surrounded the DLGN acquisition program and the number of ships to be acquired has fluctuated significantly. At present, according to Navy statements it will have four fewer nuclear escorts than needed to support its carrier force as planned. In addition to those nuclear carriers in use or under construction, the Navy has requested and received funds for construction

of the CVN 70, another nuclear carrier estimated by the Navy to cost about \$972 million.

In addition, the Congress provided Navy \$55.8 million for advance procurement of long lead time items for two additional DLGN's not yet under contract. These funds had not been requested by DOD and it has not yet been decided whether or not contracts will be awarded for the two additional ships.

In view of the lack of a firm plan regarding these two ship construction programs and the escort force structure envisioned, the Congress may want to consider:

- What impact the hi-low mix concept will have on the capability of the carriers to accomplish their mission. Speed and refueling of the non-nuclear escorts should be a critical factor.
- What really has changed in the way the Navy planned to accomplish its mission.
- Whether firm plans exist now as to specifically what type and number of ships will make up the escort force.
- Whether the carriers or escort capabilities will be degraded and therefore more vulnerable to attack.
- Whether other alternatives have or should be considered to perform the functions now performed by carriers.

AGENCY COMMENTS

A draft of this staff study was reviewed by DOD officials associated with the management of this program and comments were coordinated at the Headquarters level. The DOD's comments are incorporated as appropriate. As far as we know there are no residual differences in fact.

SYSTEM DESCRIPTION
AND STATUS

The NIMITZ Class, CVAN 68/69 and CVN 70, is a class of nuclear powered aircraft carriers which can support and operate aircraft to engage in attacks on targets in the air, afloat, and ashore which threaten our use of the sea and to engage in sustained operations in support of other forces. The CVN 70 will be an aircraft carrier with additional emphasis on anti-submarine warfare capability. The carriers are to be powered by a new design two-reactor nuclear propulsion plant.

The NIMITZ (CVAN 68) and DWIGHT D. EISENHOWER (CVAN 69) are under construction and were estimated by the Navy to be 91 percent and 37 percent complete, respectively as of June 30, 1973. The CVAN 68/69 shipbuilding contract includes an unpriced phased option for CVN 70. In fiscal year 1973, \$299.0 million for long lead time items for the CVN 70 was appropriated. Procurements for both the Government furnished equipment and contractor furnished equipment were awarded after release of the funds in September 1972.

GAO studies on the NIMITZ Class program similar to this have been issued annually beginning February 1971. This report covers changes made to the program since June 30, 1972.

COMING EVENTS

Authorization of the CVN 70 and the balance of funding of \$657.0 million, included in the fiscal year 1974 budget request, was approved

by the Congress. The exercise of the option for construction of CVN 70 is planned for the last quarter of fiscal year 1974.

COST

The June 30, 1973, program cost estimate for the three carriers of \$2,309.8 million is \$993.6 million more than the June 30, 1972, estimate. The primary reason for the increase is the addition of the CVN 70 at an estimated cost of \$972.0 million. The June 1973 estimate is also \$273.6 million more than the revised development estimate of \$2,036.2 million, and \$1,363.3 million more than the September 1965 planning estimate of \$946.5 million, which did not include an estimate for the CVN 70. A comparison of cost changes by ship for fiscal year 1973 follows:

<u>Date of SAR</u>	<u>Current estimate</u>			
	<u>Total Program cost</u>	<u>Cost of CVAN-68</u>	<u>Cost of CVAN-69</u>	<u>Cost of CVN 70</u>
	(millions)			
June 1972	\$1,316.2	\$639.4	\$676.8	
June 1973	<u>2,309.8</u>	<u>646.7</u>	<u>691.1</u>	<u>\$972.0</u>
Increase	<u>\$ 993.6</u>	<u>\$ 7.3</u>	<u>\$ 14.3</u>	<u>\$972.0</u>

Reasons for the increase were:

	<u>CVAN-68</u>	<u>CVAN-69</u>	<u>CVN 70</u>	<u>Total</u>
	(millions)			
Additional ship			\$914.0	\$914.0
Economic change	\$ 6.3	\$ 11.4	^a 58.0	75.7
Engineering change	<u>1.0</u>	<u>2.9</u>		<u>3.9</u>
Total	<u>\$ 7.3</u>	<u>\$ 14.3</u>	<u>\$972.0</u>	<u>\$993.6</u>

^aThe \$58.0 million of economic change is included in the CVN 70 estimate in reservation for contract escalation after award of the construction contract.

There were not any cost changes in the September 30, 1973, Selected Acquisition Report (SAR).

Economic Escalation

The total allowance for escalation in the estimate as of June 30, 1973, was \$222.4million. It includes adjustments in accordance with specific CVAN 68/69 shipbuilding contract escalation provisions, actual experience through fiscal year 1972, and the projection of future escalation trends reflected in the fiscal year 1974 budget submission.

FUNDING STATUS AND OUT YEAR PLAN

The current estimate as of June 30, 1973, was \$2,309.8 million for three ships. This amount is being funded under the Ship Construction, Navy appropriation by \$1,397.4 million already appropriated, \$166.8 million reprogrammed, \$721.1million in the fiscal year 1974 budget, and \$24.5 million in future years. Total funds obligated for the three ship program as of June 30, 1973, were \$1,488.1 million, of which \$862.6 million had been expended as of that date.

CONTRACT DATA

On September 14, 1970, the Navy and the Newport News Shipbuilding and Dry Dock Company, Newport News, Virginia, definitized a fixed-price-incentive contract for construction of CVAN 68 and CVAN 69 with phased unpriced options covering long lead time items and construction of the CVN 70. The contract provided for a two ship target cost of \$570.0

million, a target profit of \$68.4 million (12 percent of target cost), and a target price of \$638.4 million. The contract ceiling price was negotiated at \$760.0 million or \$121.6 million, approximately 19 percent above target price.

At June 30, 1973, there had been 908 modifications issued on the shipbuilding contract. The estimated cost of these changes was \$22.7 million, about 3.6 percent of the Navy's estimated target price of the contract. Of these changes, 873 had been priced at a total amount of \$20.6 million and 35 estimated at \$2.1 million had not yet been priced.

On October 20, 1972, the Navy exercised that part of the contract option that required the CVAN 68/69 shipbuilding contractor to provide long lead time items for CVN 70. The Navy estimates the price of this option to be \$53.4 million. This option exercise will be definitized in a package with the prospective construction proposal.

MANAGEMENT REPORTING SYSTEM

The contract for these ships did not require compliance with the Department of Defense (DOD) Directive 7000.2 (Performance Measurement for Selected Acquisitions). Reports required by the contract are considered adequate by the Navy for management of the CVAN construction program. The Navy, however, has identified certain deficiencies in the contractor's cost reporting system, particularly in the area of budgets related to contract price, updating of the budgets to reflect changes, rework, etc.; and prompt identification of budget variances and their causes. The contractor has been making efforts to improve the reporting systems in those

areas wherein he concurs there are deficiencies.

PERFORMANCE

There have been no changes in key performance characteristics of either the CVAN 68 or CVAN 69 since the planning estimate. The CVN 70 will be essentially identical with CVAN 68/69 except for those minor changes necessary to accommodate the latest model aircraft flying when the CVN 70 is delivered.

SCHEDULE

CVAN 68

During the reporting period, June 1972 to June 1973, a major scheduled milestone was met when the last of the major Government furnished equipment was delivered to the shipbuilder. Earlier development and production problems, including labor strikes in several factories, had delayed shipment of some nuclear propulsion plant components. These items are all now delivered. However, due to their later-than-planned delivery, the propulsion plant test program has slipped behind schedule. The preparation and test of the new design two-reactor nuclear propulsion plant continues to be the controlling factor with respect to CVAN 68 ship delivery. The delivery date for CVAN 68 of September 29, 1973, which is 15 months later than the planning estimate, was not met. As of December 1973 the Navy anticipated a delivery date of about September 1974. If met additional progress in the grooming and testing phase must be made before meaningful target dates for ship tests and trials can be established.

CVAN 69

Production of Government furnished nuclear propulsion plant components is proceeding satisfactorily with delivery of the components to the shipbuilder having commenced as scheduled in August 1972. Since the shipbuilding contract provides for delivery of CVAN 69 twenty-one months after delivery of CVAN 68, CVAN 69 target dates will be revised commensurate with CVAN 68 progress.

CVN 70

Procurement of long lead time components started with release of advance procurement funds in September 1972. The Navy reports that schedule slippage of the CVAN 68 and CVAN 69 will have no effect on the September 1980 planned delivery date of the CVN 70.

SELECTED ACQUISITION REPORTING

In our February 1973 report, we recommended that certain additional costs, related to the CVAN program but not identified as part of the total program estimate, be included in the SAR. The Navy, under OSD guidance, now includes these additional costs commencing with the December 31, 1972 SAR:

Shore based nuclear spares	\$108.0 million
Navy Research and Development	76.8 million
AEC development costs through fiscal year 1973	244.2 million
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Total	<u>\$429.0 million</u>

STATUS OF TESTING AS REQUIRED
UNDER SECTION 506 OF P.L. 92-156

The design of the CVN 70 is intended to be a repeat of the CVAN 68/69 with a selected update. A majority of the systems and equipment on the CVAN 68/69 have been service proven through test programs and/or extensive use in the fleet. The exceptions are the message processing and distribution system, and tactical support center in the combat system; and the versatile avionic shop test, and integrated catapult control station in the shipboard aviation system. Testing to demonstrate the operational suitability of these systems is continuing and the Navy plans to complete these tests prior to delivery of the first ship to the fleet for service. The fiscal year 1974 Congressional Test and Evaluation Data Sheets reported that the jet blast deflectors were undergoing tests. The Navy reported the service approval of the jet blast deflectors on July 2, 1973.

The operational testing of the nuclear propulsion plant system is performed on each ship at the construction shipyard. This testing is currently underway for the CVAN 68 and will continue until ship delivery.