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U. S. GENERAL ACCOUNTING OFFICE

STAFF STUDY

[DLGN-38 NUCLEAR GUIDED MISSILE FRIGATE]

DEPARTMENT OF THE NAVY AGC00001

MARCH 1974

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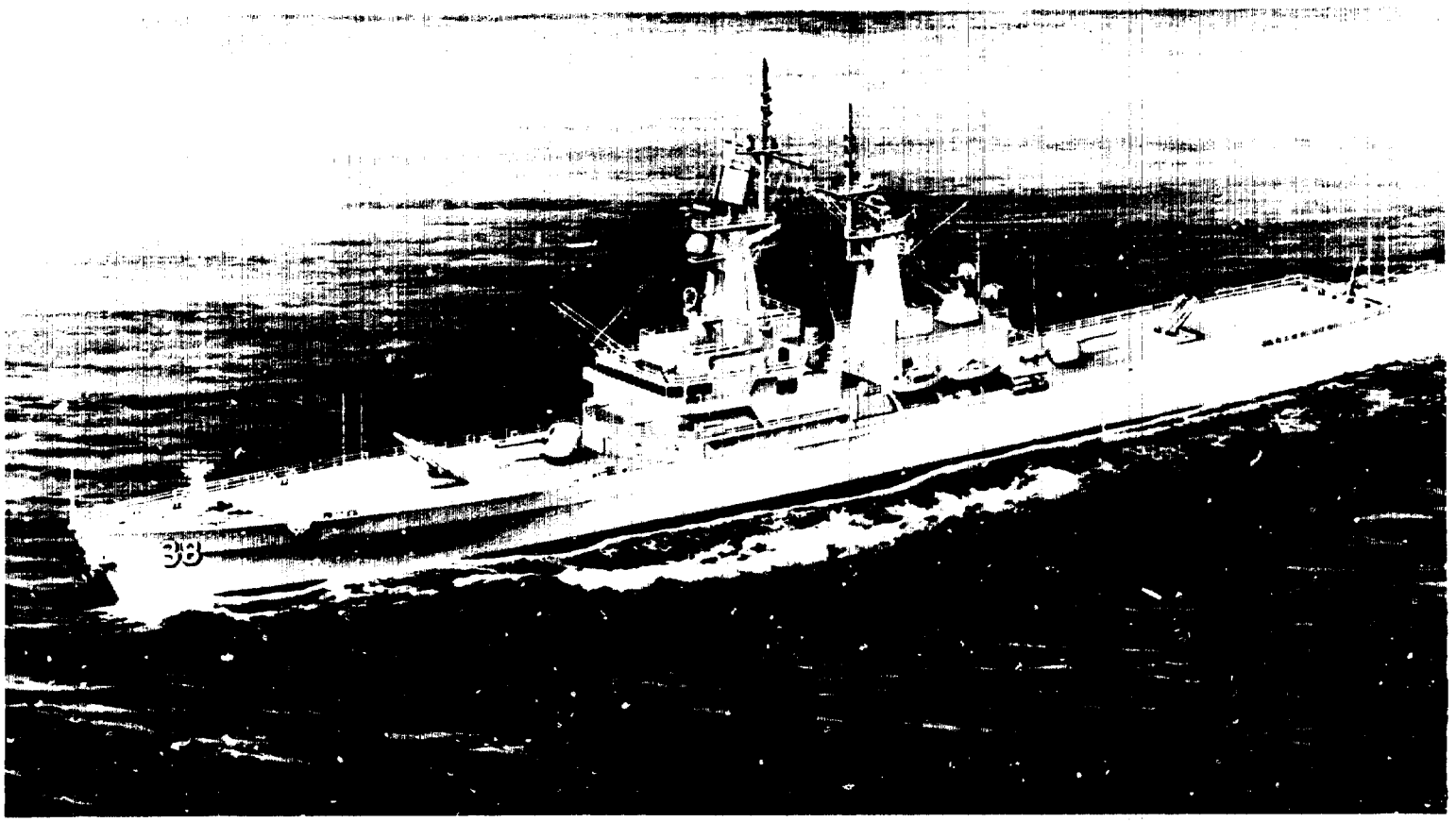
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ABBREVIATIONS

CGN	Nuclear-Powered Guided Missile Cruiser
DLGN	Nuclear-Powered Guided Missile Frigate
DOD	Department of Defense A C C 00 0005
Newport News	Newport News Shipbuilding and Dry Dock Company, Newport News, Virginia CNG 00 98 6
SAR	Selected Acquisition Report
RDT&E	Research, Development, Test and Evaluation

SYSTEM DESCRIPTION

The DLGN-38 (Virginia Class) is a nuclear powered guided missile frigate which will operate offensively in the presence of air, surface, or subsurface threat. This class ship will operate independently or with nuclear or conventional strike forces and provide protection to these forces and other naval forces or convoys. The currently approved DLGN program includes five ships--three ships (DLGN-38, 39 and 40) already contracted for and under construction and two ships (DLGN-41 and 42) subject to the Navy exercising its option under the construction contract.

The DLGN-38 is designed to have two guided missile launching stations and two 5"/54 light-weight gun mounts, and is designed to incorporate the most advanced weapons available. In addition, the ship will have a helicopter hangar.

COMING EVENTS

The Navy reported the production status (completion) of the ships at June 30, 1973, as: 37.8 percent for the DLGN-38, 19.5 percent for the DLGN-39, and 8.5 percent for the DLGN-40. The DLGN-38 is scheduled to be launched on July 31, 1974.

COST

The current program estimate at June 30, 1973, is $834.4 million which includes $55.8 million for advanced procurement of nuclear components for DLGNs 41 and 42.

Of the current estimate mentioned, $808.4 million has already been appropriated less $1.8 million reprogrammed, and $11.1 million is included in the fiscal year 1974 Navy budget. The remaining $16.7 million for outfitting and post delivery costs will be requested in future years. There have been no significant program changes since June 1973.

A summary of the planning, development, and current estimates as well as cost changes is shown below:

	Planning Estimate 2/19/69	Development Estimate 12/21/71	Cost Change 7/1/72 to 6/30/73	Current Estimate 6/30/73
	In Millions			
RDT&E	$20.4	$ 21.2	$ -	$ 21.2
Procurement	728.0	781.1	14.0	795.1
Outfit/Post Delivery	20.8	18.1	-	18.1
Total	$769.2	$820.4	$14.0	$834.4

The $14.0 million cost change between July 1, 1972 and June 30, 1973, represents an adjustment in escalation to reflect actual experience and projections based on OSD indices. To provide for this cost growth, Selected Acquisition Reports (SARs) since December 1972 have shown that the Navy made available $4.3 million by reprogramming and the balance of $9.7 million was included in the fiscal year 1974 budget.

CONTRACT DATA

In June 1970, the Navy awarded a cost plus fixed fee contract to Newport News Shipbuilding and Dry Dock Company, Newport News, Virginia, for preliminary work on the DLGN-38 class. On December 21, 1971, the contract was converted to a fixed-price-incentive contract for construction of three ships with an option for two more. The contract for the three-ship program provided for target price of $254.3 million and a ceiling price of $300 million. According to the June 1973 SAR, the target profit was $28.8 million or 12.74 percent of target cost and the sharing ratio established for the difference between ceiling price and actual final cost was 80 percent for the Government and 20 percent for the contractor. The target price for the two-ship option is $169.9 million and the ceiling price is $200.0 million.

At June 30, 1973, 164 definitized and 72 undefinitized price changes to the contract had increased the target and ceiling prices by an estimated $3.1 million to $257.9 million and $303.1 million, respectively.

The Navy, in its September 30, 1973, SAR, estimated that the contract price at completion will be $345.8 million. This difference of $87.9 million over the current contract target price of $257.9 million represents $45.9 million for escalation payments and $42.0 million to provide for anticipated contractor cost increases.

There are sufficient funds available to provide for this increase, as projected expenditures by the Navy indicate that this program will be within the current end cost estimate.

MANAGEMENT REPORTING SYSTEM

The contract for these ships does not require compliance with DOD Instruction 7000.2; however, it does include a financial control clause which is intended to provide for coordination of production planning and scheduling, budgeting, cost collection, and reporting as necessary to ensure effective cost control. The contract requires that the contractor's management control system be adequate to identify potential cost control problems and their causes in time to permit corrective action.

PERFORMANCE

The operational/technical characteristics of the DLGN-38 class remain the same in the development estimate and the current estimate except for an increase in the requirement for navigational draft from 29 feet 6 inches to 31 feet 3 inches and an increase in the full load displacement from 10,000 to 11,000 tons. The latter characteristics were based on the original contract guidance plans and with the availability

of working drawings, a more accurate estimate has been made. Other ship design aspects such as strength, stability, and speed have been satisfactorily adjusted. No cost increases are ascribed in these changes.

STATUS OF TESTING

According to the Navy, land based performance of the DLGN-38 class combat system integration started on schedule in March 1973 at Mare Island Naval Ship Yards California, and is to continue through calendar year 1974. At-sea evaluation of the combat system integration is to be conducted during calendar year 1976. Operational testing and evaluation by the Operational Test and Evaluation Force of the Navy is to be included in each of these testing segments. The testing plan has been approved by Director of Defense Research and Engineering.

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The preponderance of the major mission-related systems have already successfully completed reliability demonstration tests. The remainder are scheduled for demonstration tests in the near future. Reliability and maintainability factors for all other significant equipment are in agreement with ship system reliability and availability requirements.

PROGRAM MILESTONES

The scheduled launch, delivery, and final acceptance dates of the lead ship have slipped an additional 7 months since June 30, 1972, however, present projected expenditures by the Navy indicate that the program will be within current end cost estimates. The contractor, Newport News, ascribed the slippage to the impact of Government change orders on the overall production schedule. However, the Navy maintains that the delay was caused by lack of production manpower at Newport News. The causes for this delay are being investigated by the Navy.

With this additional slippage, the total slippage for the lead ship since the planning estimate of February 19, 1969, is as follows:

	Slippage (as of June 30,1973)	Current estimate
Start of production	13 months	December 22, 1971
Launch	25 months	July 13, 1974
Delivery	17 months	December 31, 1975
Ready for operational deployment	18 months	July 15, 1976

SELECTED ACQUISITION REPORTING

The September 1973 SAR showed procurement and program unit cost for the development estimate and current estimate for the three DLGNs (-38-39 and 40) now under construction by Newport News, as follows:

	Development Estimate	Current Estimate
	(Millions	
Procurement Unit Cost	$ 247.8	$252.5
Program Unit Cost	254.9	259.5

In computing the procurement and program unit costs, the Navy excluded $55.8 million advance procurement for nuclear components for the DLGN-41 ($45.8 million) and DLGN-42 ($10.0 million) ships, which will be built if the Navy exercises its contract option to procure these ships. We believe this is reasonable provided the Navy exercises its option sometime in the future to buy two additional ships. If this option is not exercised the $55.8 million would be sunk costs and applicable to the three-ship program.

RELATIONSHIP TO OTHER SYSTEMS

The requirement for DLGN's is closely related to the Navy's program to acquire nuclear aircraft carriers. The Navy planned to have four DLGNs for each nuclear carrier. According to the Navy, a Nuclear-Powered Guided Missile Cruiser (CGN) may be substituted for a DLGN. Currently, there is one nuclear carrier in operation and two under construction. Congress has authorized and appropriated funds for the construction of a fourth carrier (CVN-70).

As of June 30, 1973, the Navy has two DLGN's and one CGN in operation and five DLGN's under construction. Considering the Navy's plan to provide four DLGNs 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).

MATTERS FOR CONSIDERATION

The question is still open regarding the Navy's plan to provide nuclear escorts for its nuclear carriers. As we reported in our March 1972 study, much uncertainty has surrounded the DLGN acquisition program and the number of ships to be acquired has fluctuated significantly. At present, according to Navy stated needs, it will have four fewer escorts than needed to support its carrier force. 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 discussing carrier escort plans with 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 conventially 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 prevelant in DOD pronouncements recently. We were not permitted to review the current plan because, as it was explained to us, the information contained therein is not considered final and may be subject to further changes.

In addition, the Congress provided the Navy $55.8 million for advance procurement of long lead time items for two additional DLGNs not yet under contract. DOD has not requested these funds nor has it decided whether to award contracts for the two additional ships.

In view of the lack of a firm plan regarding construction of the two DLGNs and the escort force structure, 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.

--Any significant changes in the Navy's plans to accomplish its mission.

--Whether firm plans exist that specify the type and numbers of ships which will make up the escort force.

--Whether the carriers or escort capabilities will be degraded and the effect, if any, on increasing their vulnerability to attack.

--Whether other alternatives have or should be considered to perform the functions now performed by carriers and escorts.

The Congress may want to require the Navy to provide it with firm plans as to specifically what type of ships will make up the escort force.

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.