REPORT BY THE

Comptroller General

OF THE UNITED STATES

Retention Of FRAM Destroyers May Be Impractical

This report addresses the reasons cited by the Navy for retiring 20 destroyers in the Naval Reserve Force. The Senate and House Committees on Appropriations agreed in conference that the Navy should retain 12 of the destroyers while a careful review of the practicality of retaining the remaining ships was being conducted.

In view of reductions in the Navy's current force level objectives, the questionable feasibility of upgrading the ships to be combat capable, and the time and cost required to overhaul and upgrade the ships, the retention of the reserve destroyers may be impractical.

LCD-80-76

JULY 3, 1980

For sale by:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Telephone (202) 783-3238

Members of Congress; heads of Federal, State, and local government agencies; members of the press; and libraries can obtain GAO documents from:

U.S. General Accounting Office
Document Handling and Information
Services Facility
P.O. Box 6015
Gaithersburg, Md. 20760

Telephone (202) 275-6241

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

IN REPLY
REFER TO:

B-198874

The Honorable Thomas F. Eagleton
United States Senate

Dear Senator Eagleton:

Your December 18, 1979, letter requested us to review the Navy's reasons for retiring 20 of 27 FRAM 1/ destroyers in the Naval Reserve Force. You specifically requested that we (1) evaluate the material condition of the ships, (2) determine if these ships could be provided with mission essential equipment to enable them to perform a useful mission through 1985, and (3) determine if these ships could be overhauled and upgraded to extend their useful life at a reasonable cost. You also requested that we review habitability aboard the ships. Detailed information concerning these issues is provided in appendix I. Our findings and conclusions are discussed below.

The Senate and House Committees on Appropriations agreed in conference that the Navy should retain 12 of the 20 Naval Reserve Force destroyers programed for decommissioning in fiscal year 1980, while a careful review of the practicality of retaining the remaining ships was conducted. As an interim measure the Committees provided funds and directed the overhaul of 3 destroyers in fiscal year 1979 and 2 in fiscal year 1980. The fiscal year 1980 appropriation for these overhauls amounted to $34 million. These overhauls have not yet begun. The House Committee on Appropriations, on several occasions, expressed concern about the Navy's decision to decommission the reserve destroyers in light of the fact that a severe shortage of escort ships existed through 1985. However, the Navy has recently reexamined force level objectives and has determined that the number of escort ships is sufficient to meet minimum escort force level objectives.

1/The FRAM destroyers are Gearing and Carpenter class ships inducted into the Fleet Rehabilitation and Modernization (FRAM) program.

FORCE LEVEL OBJECTIVES

The Navy has recently reexamined force level objectives for surface combatants in terms of changes in threat, contribution of other forces, technology, and fiscal constraints. The Navy determined that an imbalance exists in the force structure between the mix of highly capable and less capable ships. The Navy concluded that the number of escort ships is sufficient to meet the minimum escort force level objective, and therefore, emphasis should be placed on the procurement of more highly capable cruisers and destroyers to maintain a balanced force structure. (See app. V.) As a result, the Navy substantially reduced the force level objective for escorts.

In fiscal year 1979, the Navy had a requirement for 132 escorts for operations in support of convoys--Marine amphibious and underway replenishment groups. At the end of fiscal year 1979, the Navy had only 65 escorts onhand, a shortage of 67 ships. After reexamining its force level objectives, the Navy concluded that 92 escorts is the minimum required to support operational tasks. 1/ At the end of fiscal year 1980, the Navy will have 72 escorts onhand; therefore, this shortfall will be reduced to 20 ships by the end of 1980. Based on the projections of current ship deliveries, the Navy anticipates reaching the minimum force level objective of 92 escorts in 1982 or early 1983.

We reviewed the method the Navy used to calculate minimum escort force levels. However, we did not examine the basis for the Navy's assessment that the force structure was imbalanced and force levels for escorts could be substantially reduced because of the military judgments involved. The Navy contends that the need for major combatants is far greater than the need for less capable escorts; therefore, it believes that the limited funds available should be used to improve the major combatants' capability.

MATERIAL CONDITION

The FRAM destroyers are Gearing and Carpenter class ships constructed between 1944 and 1946. They were inducted

---

1/The Navy in recent testimony has stated that the above planning figures do not include requirements for mercantile convoy escorts. In our conversation with Navy officials we learned that these requirements have not been quantified. The Navy contends, however, that the FRAM destroyers would not be suitable as mercantile escorts because (1) they cannot be upgraded adequately to perform this mission and (2) it would not be cost effective to upgrade them.

into the Fleet Rehabilitation and Modernization (FRAM) program in the early 1960s for upgrade and to extend their life an additional 7 years. The only FRAM destroyers currently operating are in the Naval Reserve Force.

The FRAM destroyers, as a result of age and incomplete overhauls, all have material deficiencies. Some of the ships are in sufficiently deteriorated condition to warrant decommissioning. However, material condition alone does not warrant the decommissioning of all the FRAM destroyers.

We visited six FRAM destroyers (See app. VI.) and found that four appeared structurally sound. However, it should be noted that three of the four ships had recently been overhauled. Of the remaining ships, one appeared to be in fair condition and the other in poor material condition. Most structural deficiencies observed appeared correctable during a normal overhaul. However, machinery and equipment on the ships are nearing the end of their useful life and require extensive overhaul or replacement. A notable deficiency found on all ships was the deterioration of the electrical wiring systems. (See app. II.) On two of the ships, we found noticeable deterioration of structure and foundation support beams in the engineering spaces. Only one of the ships visited, the U.S.S. Johnston (DD-821), had significant hull deterioration, which prevents safe underway operations.

As a result of age, growing obsolescence, and projected near-term retirement, the Navy restricted the scope of FRAM destroyer overhauls to areas affecting safety and operability. During recent overhauls, only about 50 percent of the work required to correct known material deficiencies was performed. The ships received the amount of repair necessary to keep them safe and operable, but no attempts were made to upgrade or modernize them. Because of incomplete overhauls in the past, the FRAM destroyers would now require more extensive overhauls to operate an additional 3 to 5 years. Each overhaul is estimated to cost $24 million.

Such an overhaul would require approximately 3 years to perform--16 months to plan and 18 months to execute. This does not seem practical since the FRAM destroyers are being considered for extended operations only through 1985.

UPGRADE OF THE FRAM DESTROYERS

The combat capability of the FRAM destroyers could be substantially improved by replacing or upgrading existing weaponry and systems. The degree of combat capability and related costs vary substantially depending on the types of weaponry and systems installed. The House Committee on

Appropriations report on the fiscal year 1980 Department of Defense (DOD) appropriation bill stated the FRAM destroyers should be compared with the FF-1052 Knox or FFG-7 Perry class ships. Upgrading the FRAM destroyers to this level would make them comparable to the most modern escort ships in the Navy.

The Navy has estimated that it would cost $198 million per ship to overhaul and upgrade the FRAM destroyers to a level comparable to ships of the Knox or Perry class. This estimate includes $51 million for an overhaul to extend the life of the ships an additional 10 years. The Navy has stated that a 6 to 10 year payback period is required if the ships are upgraded to be combat capable. The Navy's $198 million estimate was prepared in the absence of minimum design and cost information. However, we believe that $115 million is a more realistic estimate to upgrade the FRAM destroyers to be comparable to the Knox or Perry class. (See app. III.)

The combat capability and cost to upgrade the FRAM destroyers depends on the ships' potential to be modernized. Because of age, smaller ship size, and design limitations, it may not be possible to upgrade the FRAM destroyers to a level comparable to other escorts. A feasibility study is required to determine if weaponry and systems needed for upgrade can, in fact, be installed on these ships.

House Committee on Appropriations Modernization Proposal

The House Committee on Appropriations report on the fiscal year 1980 DOD appropriation bill stated that essential repairs and updating of the FRAM destroyers could be accomplished for $15 million to $20 million per ship and add an additional 6 to 10 years of serviceable life. However, our analysis showed that this proposal would cost approximately $40 million per ship and only extend the life of the ships an additional 3 to 5 years. (See app. IV.) In addition, the proposed modernization would not make the ships comparable to Knox or Perry class ships, and according to Navy officials, would not make the ships fully threat capable.

HABITABILITY

Habitability aboard the FRAM destroyers does not meet Navy standards and lacks many conveniences found on newer ships. Berthing and washroom facilities are crowded, poorly ventilated, and lack privacy. Overheads in the berthing areas have numerous low hanging obstacles that, in some cases,

restrict the space between the top bunk and overhead to less than 18 inches. (See app. II.) There is also limited recreational space available on these ships. Any effort to improve these conditions would be limited by the lack of space on the ships.

We found similar conditions on all FRAM destroyers inspected. Northampton bunks have been installed on three of these ships in an attempt to improve habitability. However, their installation appeared to compound already crowded conditions due to increased space requirements. Most crewmembers we talked with told us they preferred the frame type bunks that the Northampton bunks replaced.

We compared the berthing, washroom, and recreational facilities found on FRAM destroyers with those on a Knox class ship. Berthing and washroom facilities on the Knox class ship were larger, well ventilated, and private. Recreational areas included a reading area, television, and game room. We also found that work areas were more comfortable and better ventilated than those on FRAM destroyers. It appears that ship construction and design would restrict attempts to upgrade habitability on the FRAM destroyers to a level comparable to the Knox class.

CONCLUSIONS

In view of the Navy's determination that the number of escort ships is sufficient to meet minimum force level objectives and that emphasis should be placed on the procurement of major combatants to maintain a balanced force structure, it appears that the retention of the FRAM destroyers is not warranted. In addition, since the Navy questions the feasibility of upgrading the ships to be combat capable, and considering the time and cost required to overhaul and upgrade the ships, the retention of the FRAM destroyers may no longer be practical. Therefore, the House and Senate Committees on Appropriations may want to reconsider their direction to the Navy to retain the ships and to proceed with the overhaul of two FRAM destroyers at a cost of $34 million. Recommend.

AGENCY COMMENTS

As requested by your Office, we asked the Secretary of Defense and the Secretary of the Navy to provide oral comments on this report within 7 days. We met with officials of the Office of the Secretary of the Navy and obtained their oral comments and reflected these in the report where appropriate.

Navy officials concurred with the overall conclusions reached in the report. However, they stated that the report

places excessive emphasis on the issue of escort force level and could be interpreted to imply that the change in escort requirements was made to justify the decision to phase out the FRAM destroyers. Navy officials stated that the two decisions were made independently of each other and that they would decommission the ships notwithstanding the reduction in minimum escort force level.

The Navy stated that the report appears to conclude, on the basis of brief visits to six ships, that most ships are structurally sound and do not require decommissioning on the basis of material condition alone. An assessment as to the fitness of a ship for further service can only be done by a team of experienced personnel, such as the Board of Inspection and Survey, during an indepth survey.

We agree that a finding by experienced personnel of the Navy's Board of Inspection and Survey is required before a conclusion is made that a ship is structurally sound. Our conclusion was based on the fact that the Navy's Board of Inspection and Survey found only two FRAM destroyers unfit for further service as a result of its last inspection of these ships. In addition, we visited these ships with an inspector from the Board of Inspection and Survey to assess the material condition of these ships. The Navy has identified only one ship, the U.S.S. Johnston, as having significant hull deterioration which prevents safe underway operations. Although all ships have material deficiencies, it appears that most of them could be corrected during a complete overhaul.

The Navy agreed with us that it overstated its cost estimate to overhaul and modernize the FRAM destroyers. The Navy has reduced its estimate by $38 million per ship to $159.8 million, stating that certain elements of estimated personnel cost were unsupportable. The Navy did not object to our overall estimate of $114 million since it was within an accceptable range of variance.

As arranged with your office, we are sending copies of this report to the Chairmen, House and Senate Committees on Appropriations and on Armed Services, and Congressman Bill Chappell. Copies are also being sent to the Secretaries of Defense and the Navy and the Director of the Office of Management and Budget.

Sincerely yours,

Milton J. Socolar

Acting Comptroller General
of the United States

TABLE OF CONTENTS

EVALUATION OF ISSUES CONCERNING RETENTION OR DECOMMISSIONING OF FRAM DESTROYERS

INTRODUCTION

In January 1979 the Secretary of the Navy notified the Congress of his decision to retire 20 of 27 FRAM destroyers in the Naval Reserve Force during fiscal year 1980. The Secretary cited age, material condition, qualitative inadequacy to meet the current and projected threats, poor habitability, and excessive cost to modernize as reasons for retiring these vessels. Eight FRAM destroyers were decommissioned as of October 1, 1979.

The House Committee on Appropriations expressed concern with the Navy's decision during hearings on the fiscal year 1980 DOD bill. The Senate and House Committees on Appropriations agreed in conference that the Navy should retain 12 of the 20 FRAM destroyers scheduled for decommissioning in fiscal year 1980, while a careful review of the practicality of retaining the remaining ships was being conducted.

Request to reprogram fiscal year 1979 overhaul funds

The Congress had previously appropriated $48 million to overhaul six FRAM destroyers during fiscal year 1979. During hearings on the fiscal year 1980 DOD appropriation bill, the Navy requested authority to reprogram these funds. The House Committee on Appropriations denied the Navy's request and directed the Navy to induct at least three of the ships into the overhaul program before the end of fiscal year 1979. The Navy inducted three ships into overhaul during September 1979.

Decision to retire five additional destroyers

In February 1980 the Secretary of the Navy notified the Congress of plans to retire five of the remaining seven FRAM destroyers not previously scheduled for retirement during fiscal year 1981. The Congress appropriated $34 million to overhaul two of the remaining ships during fiscal year 1980. If the Navy implements the scheduled retirements, a total of five FRAM destroyers undergoing, or scheduled for, overhaul would remain in the Naval Reserve Force.

FORCE LEVEL OBJECTIVES

In 1979 the Navy's force level objective for active surface combatants consisted of 264 ships--132 cruisers and destroyers and 132 escorts. At the time, the Navy had onhand

100 cruisers and destroyers but only 65 escorts. According to Navy officials, FRAM destroyers are not included in force level objectives because of their limited combat capability.

The Navy recently reexamined force level objectives and determined that minimum force level structure should consist of 203 surface combatants--111 cruisers and destroyers and 92 escorts. 1/ At the end of fiscal year 1980, the Navy estimates they will have 107 cruisers and destroyers and 72 escorts onhand. As a result of the Navy's reexamination and interim ship deliveries, the shortage of escort vessels will be reduced from 67 to 20 ships. Based on the current delivery schedule of FFG-7 Perry class escorts, the Navy estimates the revised force level objectives for escorts will be achieved in late 1982 or early 1983. (See app. V.)

Although a shortage of 67 escort ships existed in 1979, the Navy elected to decommission 20 FRAM destroyers during fiscal year 1980. They decided it was not economical or practical to overhaul the ships to operate through 1985 when new ship construction was projected to alleviate the shortage. However, based on the Navy's determination that the number of escort ships is sufficient to meet minimum force level objectives and that emphasis should be placed on the procurement of major combatants, it appears that the retention of the FRAM destroyers may not be warranted.

Reexamination of force level requirements

The Navy reexamined force level objectives for surface combatants and assessed these objectives in terms of threat, contribution of other forces, technology, and fiscal constraints to validate or change current force level objectives. The Navy emphasized total force capability instead of the number of ships in developing a realistically attainable and capable force level objective for surface combatants.

According to the Navy, an adequate force posture consists of ships that are highly capable, such as cruisers and destroyers, and some that are less capable, such as escort

---

1/The Navy in recent testimony has stated that the above planning figures do not include requirements for mercantile convoy escorts. In our conversation with Navy officials we learned that these requirements have not been quantified. The Navy contends, however, that the FRAM destroyers would not be suitable as mercantile escorts because (1) they cannot be upgraded sufficiently to adequately perform the mission and (2) it would not be cost effective to upgrade them.

APPENDIX I

vessels. After reexamining the force level objectives, the Navy determined that the current mix of surface combatants is out of balance and that more highly capable and fewer less capable ships are needed. Navy officials told us that current ship deliveries will ensure a minimum acceptable number of escort vessels; however, a serious shortage of cruisers and destroyers is projected in the late 1980s unless more of these types of ships are procured. (See app. V.) Current force level objectives reflect the attainable balance between both highly capable and less capable ships.

Establishment of force level objectives

Surface combatant force structures are primarily based on surface combatant tasks. These tasks include battle group operations, surface action groups, Marine amphibious force support, convoy support, and underway replenishment group support. The total number of ships required is derived by the number of ships needed to carry out each task and the number of simultaneous tasks expected to be conducted.

As a result of the Navy's reexamination of force level requirements, the total number of escort ships required was computed based on the number of designated tasks and the number of ships needed to support each task. Tasks assigned to escort ships include operations in support of convoys, Marine amphibious assault groups, and underway replenishment groups. The Navy computed its 92 escort ship minimum requirement anticipating the need for 63 escorts for convoys, 5 to support Marine amphibious groups, and 24 to support underway replenishment groups.

Force level objectives for convoys

According to the Navy, force levels associated with convoy support are dependent upon the planned number of convoys. The Navy stated that the Office of the Secretary of Defense reduced planned convoy escort requirements from nine to seven groups. The Navy is expected to provide one destroyer and nine escorts to operate in support of each convoy. Based on the current anticipated convoy requirements and allied contribution, the Navy must now provide 70 ships--7 destroyers and 63 escorts--to support the number of anticipated military convoys. Under the previous requirement, the Navy planned to provide 90 ships--9 destroyers and 81 escorts--to support military convoy requirements. A comparison of existing and previous requirements is shown below.

APPENDIX I

Fisal year	Destroyers	Escorts	Total
1979	9	81	90
1980	7	63	70
Net change	2	18	20

Force level objectives for marine amphibious force

Marine amphibious support tasking is dependent on the planning goal established by the Office of the Secretary of Defense concerning the size of the Marine amphibious force requiring support. According to the Navy, the Office of the Secretary of Defense reduced the size of the Marine amphibious force requiring support from 1.3 to 1.15. The previous planning goal required 23 ships, 3 cruisers, 13 destroyers, and 7 escorts--for support. However, due to the reduced planning goal and the Navy's reexamination of force level objectives, the number of ships required for support was reduced to 17 ships--12 destroyers and 5 escorts. A comparison of existing and previous requirements is shown below.

Fiscal year	Cruisers	Destroyers	Escorts	Total
1979	3	13	7	23
1980	-	12	5	17
Net change	3	1	2	6

Force level objectives for underway replenishment groups

Navy officials have told us that force levels associated with underway replenishment groups are dependent upon the number of groups required to service the fleet. As a result of the reduction in the size of the fleet, requirements for underway replenishment groups have decreased from 11 to 8 groups. Each group required five ships--one destroyer and four escorts--for support. However, because of increased ship capabilities, the number of ships operating in support of an underway replenishment group was reduced to four ships--one destroyer and three escorts. A comparison of existing and previous requirements is shown below.

Fiscal year	Destroyers	Escorts	Total
1979	11	44	55
1980	8	24	32
Net change	3	20	23

MATERIAL CONDITION OF FRAM DESTROYERS

The Navy cited deteriorating material conditions in the hull, electrical wiring, condensers, boilers, and steam valves in support of its decision to decommission the FRAM destroyers. We reviewed the basis for these and other material deficiencies and found that most ships are materially fit for further service. In addition, we visited six ships to assess the material condition of the ships. We were accompanied by an inspector from the Naval Board of Inspection and Survey during five of the visits. Based on the documents reviewed and our visits of the ships, it appears that material condition alone does not warrant the decommissioning of all the FRAM destroyers.

Hull

The Navy identified one ship, the U.S.S. Johnston (DD-821), as having a sufficiently deteriorated hull preventing safe underway operations. Ultrasonic testing on the remaining ships is required to assess the condition of each hull and to determine the extent of repair necessary. Generally, during a scheduled overhaul of a FRAM destroyer, 10 to 12 percent of hull plating is replaced; although, on occasion, a particular ship has required from 25 to 30 percent replacement.

Electrical wiring

We found deterioration of the main electrical wireways in the engineering spaces on all ships visited. (See app. II.) Through exposure to heat and moisture, the casing of the wiring has become brittle and deteriorated, resulting in electrical shorts. Opinion is divided but most officials feel that if the wiring is not disturbed, it will be adequate for 5 additional years. However, if new wiring is added to support modern weaponry, existing wiring would be disturbed and require extensive replacement. Similarly, if retaining the ships beyond 5 additional years were considered, replacement of wiring would be needed to ensure crew safety. The Navy has estimated that replacement of wiring could cost as much as $8.5 million per vessel.

Condensers

The Navy has cited growing problems with the two main auxillary condensers on the ships. Principle among these is deterioration of the outer condenser shell and the tubing. Deterioration of the outer condenser shell is being remedied by patching the skin with epoxy. The Navy needs to perform further analysis to determine if a significant problem exists with the tubing. Navy officials told us that while a few condensers could fail within the next 5 years, most could be repaired.

Boilers

The FRAM destroyers are equipped with four boilers. The Navy has identified a need for partial retubing and rebricking of the boilers. These problems are not peculiar to FRAM destroyers and can be corrected during a normal overhaul. However, extent and magnitude of required work may exceed that experienced during a regular overhaul of other types of ships. We found no evidence that boilers on the FRAM destroyers are experiencing abnormal problems.

Steam valves

The Navy expressed concern that main steam valves on the FRAM destroyers had a dangerous wear problem. After considerable analysis by the Naval Ship Engineering Center and the valve manufacturer, the Navy concluded that a casting flaw as opposed to a wear problem was present. The Navy is now overhauling these steam valves and no longer considers them a problem.

Supply support

Navy supply officials told us that they know of no supply support problems peculiar to the FRAM destroyers. We found that the FRAM destroyers in the Pacific Fleet have a 51 percent success rate of satisfying repair parts needs from their onboard stores the same as active ships. FRAM destroyers on the Atlantic coast have a success rate of 60.5 percent. These rates are equal to or better than active ships but below the Navy's 65-percent goal.

A certain number of repair part needs are met by cannibalization of parts from inactive ships. This parts source is generally undocumented, and we were not able to determine the extent of this activity. We were told that cannibalization is done more often for convenience than necessity because stripping is faster than ordering a repair part through the supply system.

The extent of supply support problems may not be evident because the FRAM destroyers do not deploy for long periods as do some active ships. We found that FRAM destroyers initiated about two-thirds as many requests for spare parts as did active ships. However, the ships generate approximately as many casualty reports per ship as some newer active ships. This may indicate that machinery and equipment fail more frequently on the FRAM destroyers even though these ships operate less than active ships. It may also indicate that a significant number of spare part needs are met by cannibalization.

INCOMPLETE OVERHAULS OF FRAM DESTROYERS

The FRAM destroyers received a 7-year life extension when they were inducted into the FRAM program in the early 1960s. By 1972 the Navy determined it was no longer cost effective to modernize or upgrade installed systems on the ships and the scope of future overhauls should be limited. The ships have received the amount of repair necessary to keep them safe and operable but no efforts have been made to modernize or upgrade installed systems. During recent overhauls only about 50 percent of the required work was performed, thus, contributing to the ships current material condition.

Cost and time required to overhaul the FRAM destroyers

To operate the FRAM destroyers another 3 to 5 years would require an overhaul to restore the operating and performance characteristics of the ships to a condition approximating their original design and technical specifications. Navy officials state that such an overhaul would cost approximately $24 million per vessel and would require from 18 to 34 months to perform depending upon the urgency that the ship be retained. An overhaul to achieve 3 to 5 years of additional service life is possible for most of the ships if a requirement existed.

The Navy has stated that a 6- to 10-year payback period would be required if the ships are made combat capable. To keep the ships in operation for 6 to 10 years would require an overhaul of all machinery and equipment, most of which is nearing the end of its useful life. Such an overhaul would cost approximately $51 million per vessel and would require from 29 to 54 months to complete. However, the FRAM destroyers have not been considered for use past 1985.

COMBAT CAPABILITY OF THE FRAM DESTROYERS

The FRAM destroyers require significant upgrade of weapons to be as capable as other escorts currently operating in the Navy. The House Committee on Appropriations report on the fiscal year 1980 DOD appropriation bill stated that the FRAM destroyers should be compared with the Knox or Perry class escorts. Navy officials also stressed that if the ships are retained, they should be upgraded to a level of capability comparable to the Knox class. Upgrading the FRAM destroyers to this level would make them comparable to the most modern escort ships in the Navy.

Feasibility of upgrading the FRAM destroyers

In addition to assessing the material condition and the effects of age on the FRAM destroyers, the practicality of modernizing the ships must also be analyzed. Tactical obsolescence is reached when a ship can no longer support weapon systems capable of meeting the threat. Passive sonar, for example, considered necessary for long-range detection of enemy submarines, requires quiet operating ships. The FRAM destroyers, with an active sonar, have a self-generated noise problem as machinery and propulsion equipment is mounted directly to the hull. Noise transmitted by the ship limits the benefit obtained by the installation of a passive sonar. A passive capability is also required to "trigger" the LAMPS anti-submarine warfare helicopter.

Extensive modification to the FRAM destroyers would be required to install and support equipment currently on ships of the Knox and Perry classes. For example, to operate and support the LAMPS helicopter, the FRAM destroyers would require strengthening of the aft section of the ship, enlargement of the helicopter landing platform, and possible removal of the aft gunmount. Because of age, smaller ship size, and design limitations, the Navy has stated that a feasibility study is necessary to determine if the ships can be modified to accommodate the LAMPS helicopter.

The FRAM destroyers have marginal gunfire support capability and represent approximately 29 percent of all gun barrels in the Navy. However, the operation of the gunmounts are manpower intensive compared to newer gunmounts and require upgrade to be as capable as those on other escort vessels. The ships lack an anti-air defense capability and require the installation of a close-in weapon support or missile defense system to be as capable as either the Knox or Perry class.

Cost to upgrade

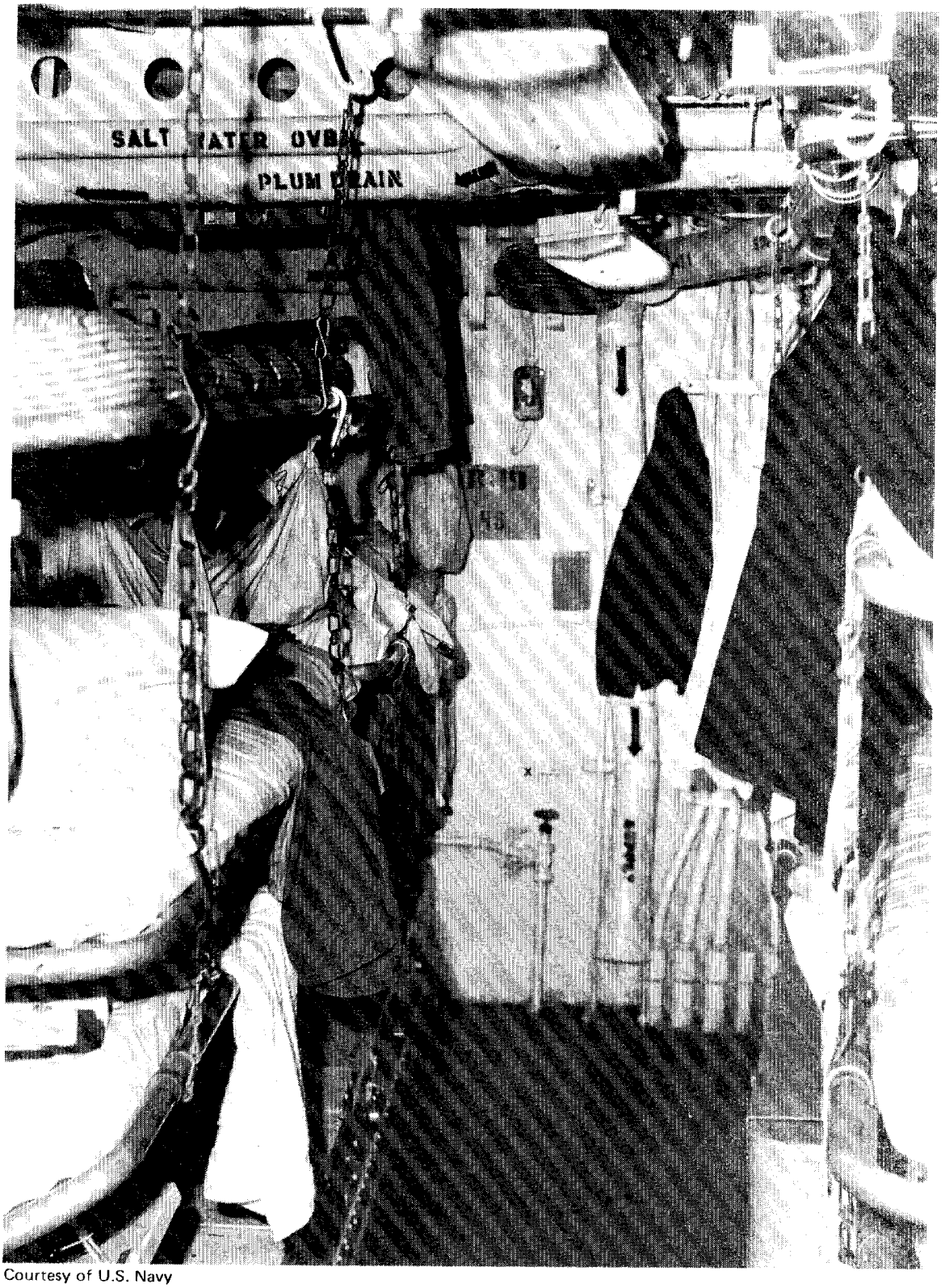
The Navy has estimated that it would cost $198 million to overhaul and upgrade a FRAM destroyer to be combat capable. This includes $51 million for an overhaul to extend the life of the ship an additional 10 years. This estimate was prepared in the absence of minimum design and cost information and may vary by as much as 40 percent. As such, the cost to upgrade the FRAM destroyers may range from $119 million to $277 million.

We reviewed the data used by the Navy to determine its cost estimate. In addition, we developed our own estimate. Because of certain questionable costs, we believe that the cost to overhaul and modernize these ships is more than 40 percent lower than the Navy's $198 million estimate. For example, the Navy established a cost element of $42 million for personnel but was unable to satisfactorily support the basis for this cost element. In addition, the Navy has proposed to install two 5"/54 guns on the FRAM destroyers while no other escort has more than one. As a result of our review, we determined that $115 million is a more realistic estimate to upgrade the FRAM destroyer to be comparable to the Knox or Perry classes and to operate an additional 10 years. (See app. III.)

The Navy agreed with us that its cost estimate to overhaul and modernize the FRAM destroyers was overstated. The Navy has reduced its cost estimate by $38 million per ship to $159.8 million, agreeing with us that certain elements of estimated personnel cost were unsupportable. The Navy did not object to our overall cost estimate since it was within an acceptable range of variance.

A feasibility study is necessary to determine if the FRAM destroyers could be upgraded to be as capable as either the Knox or Perry class. An accurate cost estimate to upgrade the ships cannot be determined until it is known if, in fact, the ships can be upgraded. However, because of the Navy's previous action to eliminate the requirement for the ships, such a study is no longer warranted.

APPENDIX II



Courtesy of U.S. Navy

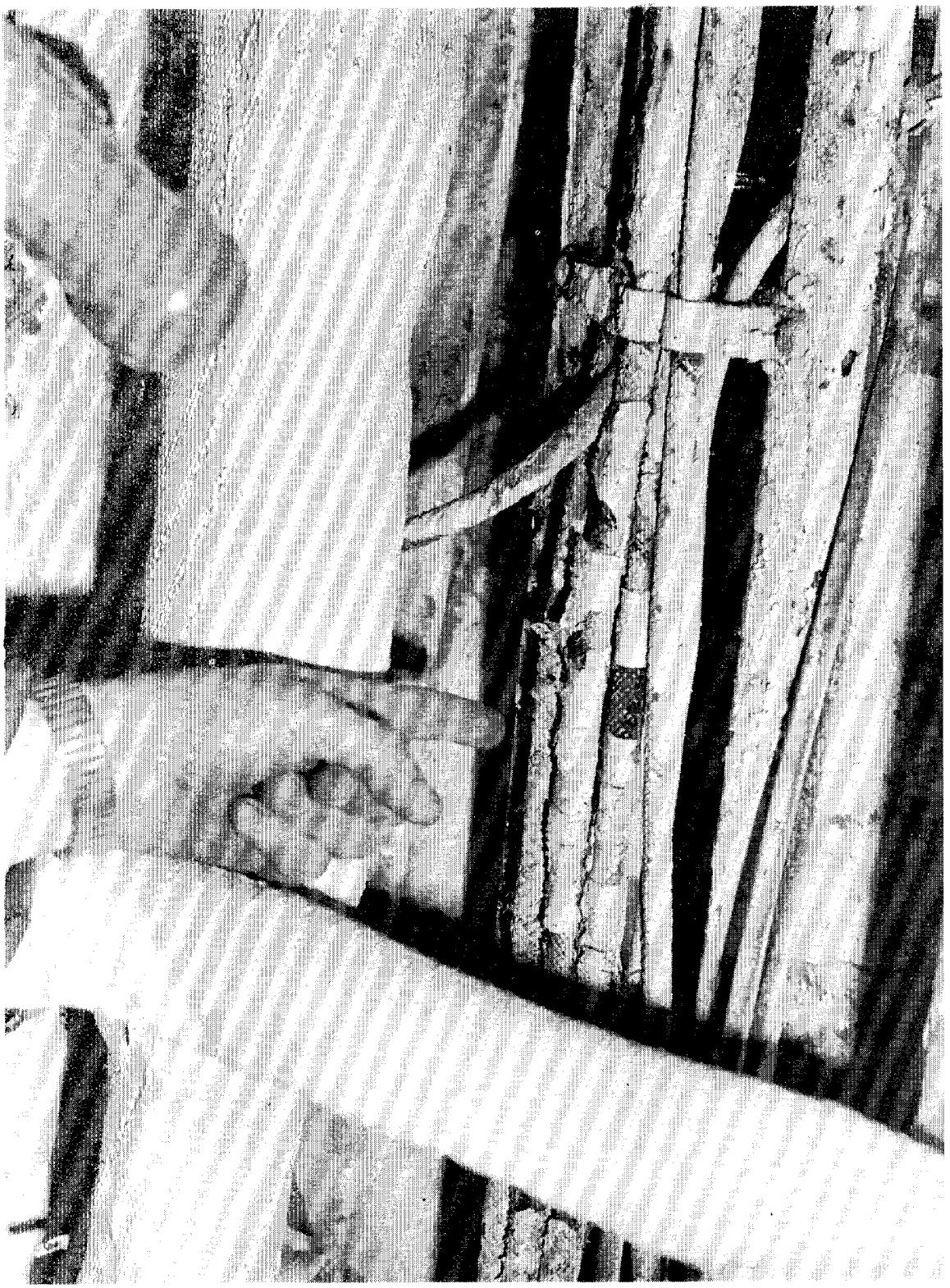
BERTHING AREA ON A FRAM DESTROYER

APPENDIX II

Courtesy of U.S. Navy

DETERIORATION OF ELECTRICAL WIRING ON A FRAM DESTROYER

APPENDIX II



Courtesy of U.S. Navy

DETERIORATION OF ELECTRICAL WIRING ON A FRAM DESTROYER

APPENDIX II

Courtesy of U.S. Navy

DETERIORATION OF A HULL SUPPORT BEAM ON A FRAM DESTROYER

COMPARISON OF NAVY AND GAO ESTIMATES OF THE PER SHIP COSTS TO MAKE 19 FRAM DESTROYERS THREAT CAPABLE (IN $ MILLIONS - 1980)

Cost element	Navy estimate Material	Navy estimate Installation	Navy estimate Total (millions)	GAO estimate Material	GAO estimate Installation	GAO estimate Total (millions)
Overhaul (SLEP)			$65.0			$51.050
Harpoon (cannister)	$2.2	$1.5	3.7	$1.381	$ .640	2.021
Pair Sonar	4.8	2.1	6.9	4.885	1.715	6.600
AN/SQR - 19	9.5	2.0	11.5	8.500	2.000	10.500
AN/SLQ - 32(V2)/ SRBOC	1.4	1.5	2.9	.632	.695	1.327
AN/SPS - 40B	1.6	1.0	2.6	1.230	.751	1.981
Phalanx CIWS	2.5	1.0	3.5	2.250	.915	3.165
MK 92 MOD 1	6.8	1.0	7.8	6.800	1.000	a/ 7.800
MK 45, 5"/54	19.6	6.0	25.6	8.300	3.000	b/11.300
Communication Upgrade	1.2	2.0	3.2	.922	1.193	2.115
ASW - TDS	3.5	2.5	6.0	3.500	2.500	6.000
LAMPS MK - 1	1.0	3.5	4.5	1.000	3.500	4.500
Other Mods	2.6	5.0	7.6			1.900
Design Costs			5.0			4.501
Personnel Costs			42.0			-
Total			$197.8			$114.760

a/For $2.552 million the MK-37 gun fire control system could be upgraded to provide a similar capability as the MK-68 aboard the Knox at a $5.248 million savings.

b/The Navy proposes putting two 5"/54 guns on the FRAM. No other escort has more than one. GAO's estimate is for a single 5"/54 gun. Since the 5"/38 guns already on the FRAM destroyers are considered marginally capable, the $11.3 million for a 5"/54 gun could be saved if no gun changes were made.

APPENDIX III

HOUSE COMMITTEE ON APPROPRIATIONS
MODERNIZATION PROPOSAL (note a)

Cost element	Committee estimate (millions)	GAO estimate Material	GAO estimate Installation	GAO estimate Total
Overhaul (note b)	$14.000	$ -	$ -	$24.000
Convert sonar from SQS-23 to SQQ-23	2.000	4.885	1.715	6.600
Install harpoon (cannister)	.875	1.381	.640	2.021
Upgrade habitability	.185	-	-	1.100
Upgrade communication	.100	.922	1.193	2.115
Upgrade radar (SPS-40B)	.400	1.230	.751	1.981
Feasibility and design	-	-	-	1.187
Weight and movement compensation	-	-	-	.100
Total	17.560			$39.104

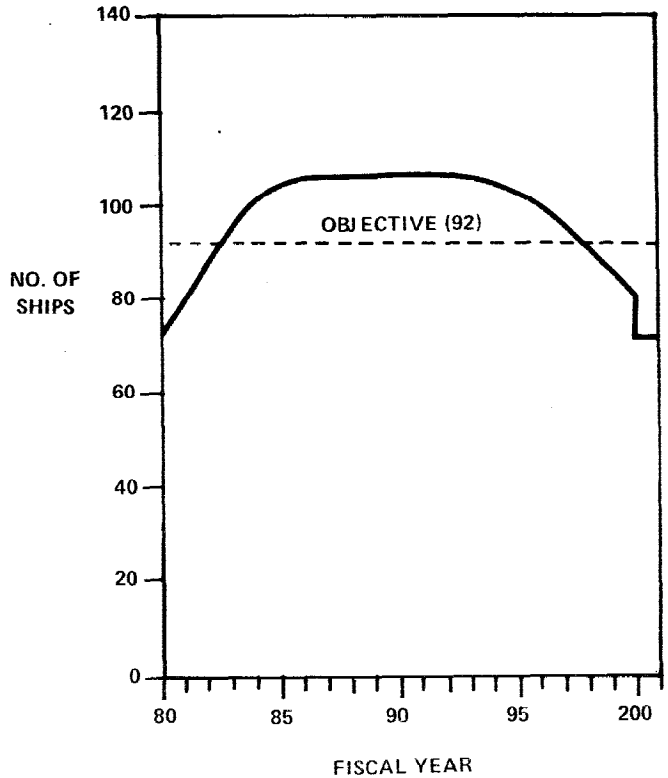
a/A ship modified in accordance with either estimate would not be comparable to a Knox or Perry class ship, and the Navy has stated it would not be combat capable.

b/This overhaul would extend the life of the FRAM destroyers an additional 3 to 5 years.

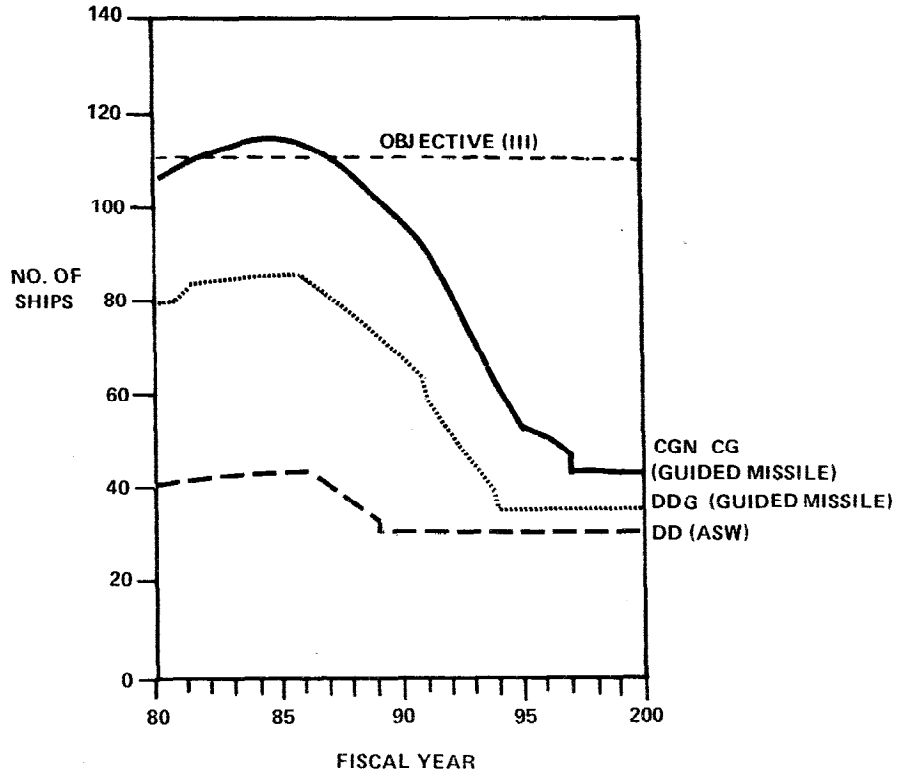
APPENDIX IV

FORCE LEVEL OBJECTIVES

ESCORTS



COMPOSITE GUIDED MISSILE CRUISER AND DESTROYER AND ANTI-SUBMARINE WARFARE DESTROYER-(CG/CGN/DDG/DD)



APPENDIX V

SHIPS VISITED BY GAO

Ship	Homeport
U.S.S. Ellison (DD-864)	Philadelphia, Pennsylvania
U.S.S. Johnston (DD-821)	Philadelphia, Pennsylvania
U.S.S. Steinaker (DD-863)	Baltimore, Maryland
U.S.S. McKean (DD-784)	Seattle, Washington
U.S.S. Southerland (DD-743)	San Diego, California
U.S.S. Orleck (DD-886)	Tacoma, Washington

(947407)

AN EQUAL OPPORTUNITY EMPLOYER

UNITED STATES
GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

POSTAGE AND FEES PAID
U. S. GENERAL ACCOUNTING OFFICE

THIRD CLASS