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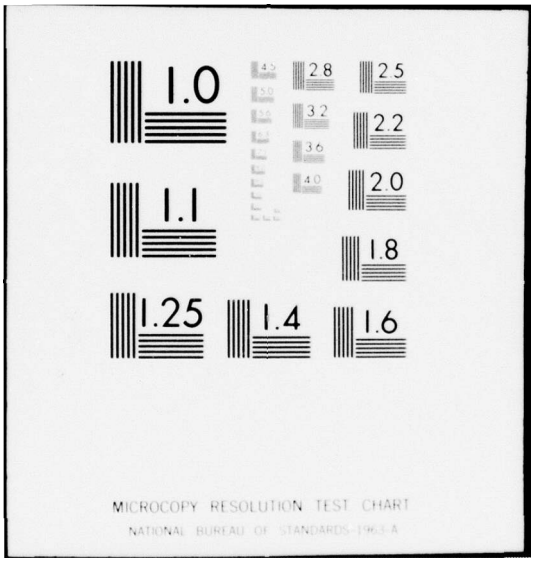
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TRANSFER OF DESTROYER TENDERS AND REPAIR SHIPS TO THE MILITARY SEALIFT COMMAND

LMI Task 76-11

N. Betaque
J. Wilk

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November 1976

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SUMMARY

One of the major challenges facing the Department of the Navy is to reduce the resources required for support of the combatant fleet while maintaining or improving combat capability and readiness. This study examines a proposal for reducing the operating costs of the Mobile Logistic Support Force by transferring destroyer tenders and repair ships to the Military Sealift Command (MSC). The concept assumes that the ships would be operated and maintained by U. S. Civil Service Marine personnel, while responsibility for intermediate maintenance activities and most other support services would be retained by military personnel assigned to embarked military departments.

The study focuses on a case example of a GOMPERS class destroyer tender operating in the Atlantic Fleet. Of the nine existing destroyer tenders and five existing repair ships, only two, USS SAMUEL GOMPERS and USS PUGET SOUND, are less than 30 years old. The others are scheduled for replacement in the 1980s. Two new tenders similar to the GOMPERS class are now under construction and scheduled for completion in 1980.

The major advantage of the transfer would be the elimination of 380-398 military billets per tender (over 4,000 for all 14 tenders and repair ships). These billets could be used to alleviate shortfalls in combatant ships or elsewhere in the Navy. Alternatively, if it were determined to be more advantageous to achieve economic savings, end strength could be adjusted downward to reflect the elimination of these billets. The cost to the Government of operating these ships would then be reduced by at least one million dollars per ship per year.

The principal disadvantage of such an arrangement would be the possible adverse effect that differences between Navy and MSC pay and living conditions could have on the morale of the embarked military personnel. The potential for problems would exist, but

past experience with Army repair military personnel aboard USNS CORPUS CHRISTI BAY indicates that friction between the civilian crew and the embarked military department need not be a serious obstacle to implementation by the Navy.

Notwithstanding the misgivings of some Naval officers concerning the idea of mixing large populations of military and civilian personnel on board the same ship, the advantage to the Navy of freeing a substantial number of military personnel for reassignment to combatant ships or other unfilled billets justifies a test of the concept. We recommend that the Navy initiate plans to configure one of the destroyer tenders now under construction for MSC manning on a trial basis. We believe a two-year trial would be necessary to establish operating procedures and experience a normal six-month overseas deployment.

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I. STUDY OBJECTIVE

One of the major challenges facing the Department of the Navy is to reduce the resources required for support of the combatant fleet while maintaining or improving combat capability and readiness. A significant part of the fleet support is provided by the Mobile Logistic Support Force. This force consists of 113 ships which provide the fleet with underway replenishment, mobile maintenance and repair facilities, and other miscellaneous support services (e.g., salvage, tug and submarine rescue).

This study addresses a proposal for reducing the operating costs of the fourteen destroyer tenders and repair ships of the Mobile Logistic Support Force. Specifically, the objective of the study is to examine the economic and operational implications of transferring ownership of destroyer tenders and repair ships to the Military Sealift Command (MSC). The proposal assumes that responsibility for the intermediate maintenance activities and most other support services normally provided by destroyer tenders and repair ships will be retained by military personnel assigned to an embarked military department (MILDEPT). In effect, the proposal is to have MSC operate and maintain the vessel as a platform for MILDEPT activities.

The study is a broad appraisal of the proposal. It focuses on a typical destroyer tender (GOMPERS class) operating in a typical scenario (Atlantic Fleet). The goal is to determine if there is sufficient merit in the concept to warrant detailed analysis by the Navy.

II. CAPABILITIES AND UTILIZATION OF DESTROYER TENDERS AND REPAIR SHIPS

The primary mission of destroyer tenders and repair ships is to provide a mobile facility for intermediate maintenance support to surface combatants, auxiliaries, and amphibious warfare ships. There are nine destroyer tenders and five repair ships now in the active fleet. All but two, SAMUEL GOMPERS and PUGET SOUND, are World War II era ships (see Table 1). The Navy plans to replace most of the older tenders with new tenders similar in design to the GOMPERS class.[1] There also are plans to replace the repair ships.

TABLE 1. ACTIVE DESTROYER TENDERS AND REPAIR SHIPS

Destroyer Tenders	Hull No.	Launched
DIXIE	AD-14	1939
PRAIRIE	AD-15	1939
PIEDMONT	AD-17	1942
SIERRA	AD-18	1943
YOSEMITE	AD-19	1943
SHENANDOAH	AD-26	1945
BRYCE CANYON	AD-36	1946
SAMUEL GOMPERS	AD-37	1966
PUGET SOUND	AD-38	1966
Repair Ships		
VULCAN	AR-5	1940
AJAX	AR-6	1942
HECTOR	AR-7	1942
JASON	AR-8	1943
GRAND CANYON	AR-28	1945

Destroyer tenders and repair ships are capable of accomplishing most ship repairs not requiring dry docking. This includes maintenance and repair of hull, mechanical, electrical, and electronics equipment, fabrication of parts and fixtures, and underwater repairs within the capabilities of divers. Tenders are distinguished from repair ships by the tenders' more extensive sensor and weapons repair capability, especially for missile

[1] Two new destroyer tenders are under construction, AD-41 and AD-42. They are scheduled for completion in 1980.

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and torpedo repair. The newest tenders also have nuclear propulsion repair facilities not available on older tenders or repair ships. Repair ships, on the other hand, generally have a greater capability in machine shops, foundry, diesel engine repair and heavy structural repair. A list of repair shops and services typically provided by tenders and repair ships is at Appendix A.

In addition to repair and services associated directly with the repair mission, tenders provide a variety of support services. These support services, most of which are listed in Table 2, have given tenders and repair ships a traditional role of general support to the fleet that extends beyond the repair mission of an afloat intermediate maintenance activity.

TABLE 2. NON-REPAIR SERVICES TRADITIONALLY PROVIDED BY DESTROYER TENDERS AND REPAIR SHIPS

Hotel Services (i.e., electricity, steam, potable and feed water, high and low pressure air)

Primary Dental and Supplementary Medical Services

Flag Accommodations (i.e., berthing, messing, office and communications facilities for a flag officer and his staff)

Boat Services (i.e., ship-to-shore and inter-ship transport of personnel, equipment and supplies)

Contingency Underway Replenishment (UNREP) and Supply Support (e.g., food, fuel, ammunition, and compressed gasses)

Interim Support to Crews of Tended Ships (e.g., berthing, messing, disbursing, laundry, dry cleaning, brig facilities, and communications guard)

Miscellaneous Support (e.g., crane and other material handling services, inspection teams, beach guard, pier services, chaplain services, legal services)

The primary rationale for having tenders and repair ships is to meet the mobility requirements of a contingency situation. In peacetime, they normally are employed in areas of heavy fleet concentration to provide the maximum opportunity for productive utilization of the investment in maintenance facilities. This typically results in their

being concentrated in fleet home ports, with two or three in the Mediterranean Sea and the Western Pacific to service deployed fleets. In the Atlantic Fleet, tenders and repair ships also are employed out of their home ports to service other naval ships along the Atlantic seaboard. (A typical operating profile for tenders and repair ships of the Atlantic Fleet is given in Appendix B.)

Whether deployed overseas or operating in CONUS ports, tenders and repair ships spend relatively little time at sea. Other than brief quarterly training exercises, most of the tender and repair ship underway time is spent in point-to-point transits, either between CONUS and overseas deployment areas or between home port and other CONUS ports.

Tenders and repair ships can provide repair services either at anchor, moored to a buoy, or alongside a pier. In remote areas, they normally operate without benefit of a pier or shore services. However, it is the practice in peacetime to berth tenders at piers. This practice has the advantages of ease of access to supply facilities, readily available telephone service, and the convenience of hotel services from shore facilities.

III. CONCEPT OF MSC OWNERSHIP

The Military Sealift Command (MSC) is an operating command of the U.S. Navy. Its primary mission has been that of strategic sealift and support of all U. S. Armed Forces. Recently, MSC was assigned an added mission of operating certain ships in direct support of the fleet. This fleet support mission now encompasses the operation of sixteen of the 67 ships operated by MSC.[2]

MSC's fleet support mission is an outgrowth of the "CHARGERLOG" program. CHARGERLOG is the designation given to a program of tests which involved the use of merchant ships and MSC ships to provide support to the fleet. The success of the CHARGERLOG program provided the stimulus for the assignment of a fleet support mission to MSC.

The proposal for transfer of destroyer tenders and repair ships to MSC assumes that these ships would join the MSC fleet support program. Each ship would be commanded by an MSC master who would be responsible for the operation, navigation and safety of the ship. The MSC crew would provide those functions normally performed by the deck, engine and steward departments. The MILDEPT would be responsible for those functions of a destroyer tender or repair ship normally performed by the repair department, the weapons logistics department, the supply department (except messing), the administration department, the medical department and the dental department. In addition, the MILDEPT would be responsible for communications (including internal ship communications), signalling, gunnery, and the combat information center (CIC). (Appendix C provides a more detailed description of the assumed allocation of functional responsibilities between the MSC crew and the MILDEPT.)

[2]These fleet support ships include 7 oilers, 4 tugs, 4 FBM resupply ships, and 1 refrigerated stores ship.

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The ships, though operated and maintained by MSC, would be under the direct operational control of fleet commanders or their subordinate commanders. Scheduling would be done by the operational commander. The vessels would revert to MSC operational control when undergoing overhaul or major repair.

MSC operations are industrially funded. Its costs are recouped by billing its customers (i.e., the Atlantic and Pacific Fleets).[3] MSC operates and maintains its ships in accordance with standard commercial practices. Fuel, supplies, and materials are obtained from the least expensive government or commercial sources; about 85% are obtained from the Navy supply system. Overhauls and maintenance beyond the capabilities of the MSC crew are normally obtained by competitive bid from commercial shipyards.

Except for small military communications detachments on some ships, MSC fleet support ships are commanded and crewed by U.S. Civil Service Marine personnel. Civil Service Mariners are civilian employees of the Department of the Navy. They are hired in accordance with the regulations of the U.S. Civil Service Commission. Like merchant seaman, Civil Service Mariners must be licensed or certified by the U.S. Coast Guard. However, unlike merchant seaman, they do not sign-on for a voyage, nor is their assignment to a ship made by the union. Civil Service Mariners are permanent or temporary Federal employees; their assignments are made by MSC. Union membership is permitted, and the maritime unions are the spokesmen for Civil Service Mariners in matters pertaining to pay, benefits, and working conditions. However, union membership is not required, and each employee must sign a non-strike agreement. Except for compensation which is established at rates comparable to those of the private sector of the shipping industry, most conditions of employment, promotion, retention and benefits are the same as for any other Civil Service employee.

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[3]All expenses of the MILDEPT, including repair and overhaul of industrial plant equipment, would be assumed by the supported fleet.

In matters of discipline, the master has paramount authority over all persons assigned to or embarked in the ship. However, in dealing with military personnel, this authority is normally delegated to the commanding officer of the MILDEPT who has court-martial jurisdiction over the military personnel.

IV. STUDY APPROACH

The objective of the study is to examine the economic and operational implications of transferring ownership of destroyer tenders and repair ships to MSC. The approach used is to focus on a typical destroyer tender operating in a typical peacetime scenario and to estimate the impact of transferring that tender to MSC.

The tender selected as the subject of the study is a GOMPERS class ship operating in the Atlantic Fleet. The GOMPERS class was chosen because the other tenders are very old, have less capability, and are expected to be replaced by ships similar in design to the GOMPERS class.

The peacetime scenario includes periodic deployments to the Mediterranean Sea. It is assumed that a contingency deployment might differ only in the location and duration of the deployment and the tempo of operations.

To provide a basis for estimating both the manpower and operating implications of the proposal, assumptions were made about the operating profile and the allocation of functions between the MSC crew and the MILDEPT. These assumptions are described in Appendices B and C, respectively. In constructing an operating profile and allocating functional responsibilities, every effort was made to maintain the existing mission capabilities of a tender, including such general support functions as boating services. The capabilities and capacities of the repair and weapons logistics departments were held constant by not introducing changes in the physical configuration of the spaces associated with those functions and in the quantity and quality of the technical skills involved. Similarly, no changes were introduced which would affect the intra-ship support (e.g., stores, communication, etc.) of the repair function or to the other services (e.g., medical, dental, etc.) provided by the tender.

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In effect, retaining existing military capability meant that only certain portions of the ship's organization were susceptible to change: command and control, deck, engineering, and segments of the supply and administration departments. For the functions associated with these departments, specific Navy billets were identified by rate and rating as candidates for elimination. Estimates then were made of the MSC manning levels required to fulfill the functions formerly associated with eliminated Navy billets.

Despite efforts to keep capability constant, it must be recognized that an MSC ship is operated and maintained differently than is a commissioned naval vessel. Some of the differences might be interpreted as a reduction in capability or quality of service. For example, largely as a result of having a smaller crew, MSC follows different damage control and firefighting procedures and may establish different watch stations. MSC does not use the standard Navy Material Maintenance Management System (3M), nor does it follow the standard 53 month overhaul cycle for tenders (48 months between overhauls of five-month duration). MSC has its own preventive maintenance program which follows American Bureau of Shipping and U.S. Coast Guard standards. Its normal overhaul practice is to drydock a ship biennially for a period of about a month with a repair availability of about 20 days in the intervening years.

The economic implications of transferring a GOMPERS class tender to MSC result primarily from modifications needed to meet commercial marine habitability standards for the MSC crew and from differences between the size and cost of the Navy and MSC crews. The cost to the Government of the eliminated military billets was estimated using the Navy Billet Cost Model (See Appendix D). The compensating costs of the modifications, the MSC crew and expenses peculiar to MSC operations were estimated by MSC (see Appendix E). The adjustments needed to assure comparability of Navy and MSC costs and to tailor the estimates to the operating profile are described in Appendix F.

V. FINDINGS

A. MANPOWER

Transfer of a GOMPERS class destroyer tender to MSC would eliminate at least 380 military billets, thereby releasing Navy personnel for reassignment to combatant ships or other unfilled billets. If the Navy is willing to forgo the gunnery, signalling and CIC capabilities, as has been done on other ships transferred to MSC, another 18 billets could be eliminated. Extended to all fourteen destroyer tenders and repair ships planned for the 1980s, the total number of military billets which could be eliminated exceeds 4,000.[4]

It is estimated that in FY77 total documented Navy requirements for military manpower in ships and aircraft squadrons will exceed funded billets by 14,800.[5] If transfer of all destroyer tenders and repair ships to MSC were feasible, it would decrease the number of unfunded requirements by 27%. Moreover, 10% of the billets which would be eliminated are in rates and ratings experiencing severe problems in manning level, experience level, or retention: quartermaster, machinist's mate, boiler technician, and hull technician.[6]

An MSC crew of 147 (157 when deployed overseas) would be required on a GOMPERS class tender to perform the functions associated with the eliminated military billets. Normally, an MSC crew is much smaller than the military crew it replaces: it is more experienced, there are no trainees or redundancies in the manning schedules, no military duties are required of the personnel, and operating procedures are geared to efficient operation of the vessel rather than combat requirements.

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[4]These estimates are based on examination of manpower authorization documents. Ships are not always manned to 100% of authorizations, nor are billets always filled with personnel having the authorized rates and ratings.

[5]U. S. House of Representatives, Subcommittee on the Department of Defense. Hearings, Department of Defense Appropriations for 1977, Part 4, 94th Cong. 2nd Sess., p. 117.

[6]Department of the Navy, Bureau of Naval Personnel. "Rating Health and Welfare Report, Summary FY 1976."

The current supply of U. S. merchant seamen exceeds demand. However, the Maritime Administration expects the current surplus of licensed deck and engine officers to dissipate by 1980, and projects a 10% shortage of these officers through the 1980s.[7] The manning schedule formulated by MSC for operation of a GOMPERS class tender includes five deck officers and five engine officers. If the projections of the Maritime Administration prove correct, MSC could face greater competition in finding qualified personnel to fill these billets.

B. COSTS

MSC operation of a GOMPERS class tender would cost the Government about one million dollars less per year than current Navy operation. This estimate is based on a peacetime operating profile[8] and takes into consideration the total cost to the Government of military and civilian manpower, including the full costs of the retirement programs and the costs of keeping billets filled with personnel having the authorized rates and ratings (see Appendix F). If only the direct operating costs of the ship are considered, the reduction in direct Military Personnel, Navy (MPN) appropriations—(the pay and allowances of military personnel assigned to the ship)—which would result from the elimination of military billets would about equal the increase in direct Operation and Maintenance, Navy (OMN) appropriations required to reimburse MSC for operating and maintaining the ship (see Table 3). This indicates that the economic advantage to the Navy of transferring a tender to MSC would lie in the reduction of indirect personnel costs (e.g., training, PCS and personnel pipeline) and retirement obligations.

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[7] U. S. Department of Commerce Maritime Administration. Deck and Engine Officers in the U. S. Merchant Marine: Supply and Demand, 1974-1984. May 1974.

[8] For operating in a specified war zone, the MSC crewmen would receive additional bonuses equal to 100% of base pay, or a total of $1.5 million per ship per year of deployment in the war zone.

TABLE 3. IMPACT OF TRANSFER ON ANNUAL DIRECT OPERATING COSTS OF A GOMPERS CLASS TENDER

(Thousands of Dollars)

	Current Navy Operation*	Impact of Transfer	Projected MSC Operation
DIRECT MPN	$ 9,719	-$3,439	$ 6,280
DIRECT OMN	2,125	+ 3,380	5,505
TOTAL DIRECT	$11,844	-$ 59	$11,785

*Office, Chief of Naval Operations. Navy Program Factors, Vol. I, 1 July 1975.

Transfer of existing ships to MSC would require a one-time investment of about $5 million per ship for alterations needed to accommodate MSC operating procedures and habitability standards.[9] However, for ships in the early stages of construction or not yet under construction, MSC expects that MSC requirements could be satisfied at no extra cost. This consideration is particularly pertinent in planning for replacement of the World War II vintage tenders and repair ships.

Apart from the question of alterations, it must be noted that the savings in operating costs discussed above would only be achieved if the Navy used the eliminated military billets to reduce end strength. If the Navy found it more effective to apply the manpower to meet shortfalls in the manning of combatant ships or other requirements, there would be no decrease in the MPN budget. The net budgetary impact of the transfer would be an increase of $3.4 million per ship.

The findings presented here are based only on analysis of manpower requirements and costs peculiar to MSC operations. All other operating costs (e.g., fuel, utilities and maintenance) are assumed to be constant whether the ship is operated by MSC or by one

[9]MSC estimates that the minimum modifications for a trial could be accomplished for $1.7 million. See Appendix F.

of the Navy fleets. This assumption probably is conservative. There is some evidence that MSC maintenance practices are less expensive than the normal practices followed for commissioned Naval ships.

A 1974 Cooper and Company study[10] compared the costs and effectiveness of maintenance performed on Navy oilers, MSC tankers, and commercial tankers, focusing only on those types of equipments which were common to all three ships. In Phase I of its study, Cooper and Company found that on an annualized basis the Navy spends three times as much on overhaul repairs and over five times as much on interoverhaul maintenance as does MSC. In Phase II of the study, when comparisons were made between MSC and Navy estimates of overhaul costs for the same Navy ship and for ships in the same physical condition, the long term costs of MSC and Navy overhauls were about the same. (Whereas the MSC cost per overhaul was about half that of the Navy, the frequency of MSC overhauls is twice that of the Navy.) The joint findings of both phases of the study suggest that MSC maintenance practices may be more effective than the normal maintenance given a Commissioned Naval ship (the MSC ships were in better condition) and that the cost of maintenance accomplished between overhauls is substantially less.

Other than oilers, the only types of ship that are operated by both MSC and the Navy are refrigerated stores ships (AF) and fleet tugs (ATF). MSC has operated a refrigerated stores ship only since June, 1975, so there is insufficient MSC experience upon which to base a comparison of maintenance costs. For the fleet tugs, recent experience generally reinforces the Cooper and Company findings. MSC average annual maintenance costs for the ATAKAPA (T-ATF 149) during FY 75 and FY 76, $287,000, were approximately half that experienced by the U. S. Atlantic Fleet for similar ships.

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[10] Cooper and Company. Reducing the Cost of Navy AO Overhauls: Phase II of the SOAMS Project, 1974.

Experience with MSC operation of oilers and fleet tugs thus provides reason for expecting the maintenance costs for MSC operation of tenders also to be less than current Navy operation of these ships. However, the direct extension of oiler and tug experience to tenders is inherently speculative, since the repair department of a tender is capable of doing much of the maintenance work normally associated with an industrial overhaul.

C. MIXED MANNING

Differences between the pay, working conditions, and dress and living standards of the MSC crew and those of the military personnel assigned to the MILDEPT would be a potential source of discontent aboard the ship. The military personnel are theoretically available for work, when and where required, 24 hours a day, seven days a week. They may be called upon to perform a variety of tasks, such as standing shore patrol, securing watches, etc. Their pay is fixed regardless of overtime.

The base pay for the MSC crew is predicated on a 40-hour week. For duty beyond 40 hours, they receive overtime pay. They also receive penalty pay for performing unpleasant tasks, and bonuses for handling ammunition or for serving on a ship which carries ammunition.

On GOMPERS class tenders, enlisted military personnel are berthed in large, community style living quarters, bunked three high, and use community toilets and showers. They take their meals in the customary cafeteria style "chow line." MSC crews would live in two-man staterooms with semi-private toilets and showers. They are served "sit-down" meals by MSC stewards. Moreover, Civil Service Mariners are not required to adhere to the Navy standards of dress and appearance required of military personnel.

On existing MSC fleet support ships, these differences in standards have been alleviated by providing the MILDEPT with the same living conditions as the MSC crew. However, the MILDEPTS aboard existing MSC fleet support ships are small, less than twenty men. On tenders and repair ships, approximately 80% of the personnel aboard would be in the MILDEPT. Not only is there insufficient space to provide the military

personnel with the same habitability standards required for the MSC crew, but the cost of doing so would be prohibitive. As for the feasibility of providing the MSC crew with facilities comparable to those of the MILDEPT, it is unlikely that the MSC crews would accept "below standard" accommodations for more than a short test period, and probably then only if there existed substantial unemployment in the maritime industry.

However, there is some reason for believing that large-scale mixed manning can be accommodated without undue Military-civilian friction. From 1965 to 1972, the U. S. Army employed the USNS CORPUS CHRISTI BAY in South Vietnam as an afloat helicopter maintenance activity. The ship was operated and maintained by an MSC crew of 131 Civil Service Mariners, while the helicopter repair activities were conducted by 308 military personnel of the 1st Transportation Corps Battalion. Except for the lack of common skills and marine backgrounds, the relationship between the Army personnel and MSC crew was comparable to that anticipated between the MILDEPT and crew of a MSC operated tender. Two former commanding officers of the battalion said that although the Army personnel were well aware of the different standards and much better pay of the MSC crewmen, the differences caused no morale or discipline problems.[11] It was recognized that the differences which existed simply reflected some of the basic differences between civilian employment and military duty, and the situation was accepted.

Despite the experience with both military and civilian personnel on existing MSC operated fleet support ships and the experience of the USNS CORPUS CHRISTI BAY, some Naval officers remain concerned about the mixed-manning concept.

D. ASSIGNMENT PATTERNS

Some Navy skills which are essential for sea operations have little or no shore-based application. As a result, the Navy has difficulty creating enough shore-based billets in these ratings to provide career personnel with the desired rotation between sea and shore duty.

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[11] Conversations with COL R. D. Descoteau, USA, and LTC James A. Grier, USA.

Assignment to a destroyer tender is considered neutral duty; it counts as neither shore duty nor sea duty. However, it is generally preferred to sea duty, and thus provides non-sea duty billets in some of the ratings for which there are few shore billets. Approximately 14% of the billets eliminated by the transfer of destroyer tenders and repair ships to MSC would be in rates and ratings for which the ratio of months of sea duty to months of shore duty is 60/24. Thus, the loss of tender billets could aggravate Navy efforts to provide desirable assignment patterns for some career personnel.

E. REPAIR DEPARTMENT PRODUCTIVITY

Because the transfer of a destroyer tender to MSC would be accompanied by a major reduction of the number of military personnel aboard the ship, the burden of normal work details and military duties might fall heavier on those remaining in the MILDEPT. This could adversely affect the productivity of the Repair Department.

On the other hand, a tender which is operated and maintained by MSC would not require self-availabilities, extended refresher training, or independent ship exercises—all of which now reduce the time the Repair Department can devote to its primary mission of support to other ships. In addition, some of the activities which are now a drain on the availability of military manpower would become the responsibility of MSC (e.g., quarterdeck and "cold iron" watches) and would not be imposed on the Repair Department.

F. RELIABILITY OF AN MSC CREW

Some Navy officers, though expressing high regard for the seamanship of MSC crewmen, are reluctant to depend on Civil Service Marine personnel for essential fleet support in the event of a war or other military contingency. The attitude is not one of mistrust, but simply uncertainty.

This lack of confidence in non-military personnel appears to be unfounded. In a March 1975 statement prepared for the Seapower Sub-committee, House Committee on

Armed Services, Rear Admiral John D. Chase, Commander, Military Sealift Command, testified:

> Three decades of performance in wartime, emergencies and difficult peacetime operations attest to the reliability of U. S. Civil Service seamen. Ships they crew are always under military control and MSC has full authority to take disciplinary action whenever necessary. However, at no time in the past 24 years have U. S. Civil Service crews refused to carry out a military mission. On the contrary, seamen often have risked their lives, and some have lost their lives during operations in combat zones as a number of MSC ships were fired upon or mined. MSC civil marine personnel have operated fleet ballistic missile resupply ships for a decade, and have served on ships which directly supported operations in South Vietnam, Korea, and during a number of other crises which required deployment and support of U. S. military forces in the highest tradition of the U. S. Merchant Marine.

VI. CONCLUSIONS AND RECOMMENDATIONS

The concept of transferring ownership of destroyer tenders and repair ships to MSC is feasible. There is no reason that these ships, operated and maintained by MSC crews with embarked MILDEPTs, could not effectively perform the primary missions now assigned to Navy destroyer tenders and repair ships.

The major advantage of the transfer would be the elimination of 380-398 military billets per tender (over 4,000 for all 14 tenders and repair ships). These billets could be used to alleviate short-falls in combatant ships or elsewhere in the Navy. Alternatively, if it were determined to be more advantageous to achieve economic savings, end strength could be adjusted downward to reflect the elimination of these billets. The cost to the Government of operating these ships would then be reduced by at least one million dollars per ship per year.

The principal disadvantage of such an arrangement would be the possible adverse effects that differences between Navy and MSC pay and living conditions could have on the morale of the embarked military personnel. The potential for problems would exist, but past experience with Army repair personnel aboard USNS CORPUS CHRISTI BAY indicates that friction between the civilian crew and the embarked military department need not be a serious obstacle to implementation by the Navy.

Notwithstanding the misgivings of some Naval officers to the idea of mixing large populations of military and civilian personnel on board the same ship, the advantage to the Navy of freeing a substantial number of military personnel for reassignment to combatant ships or other unfilled billets justifies a test of the concept. We recommend that the Navy initiate plans to configure one of the tenders now under construction (AD-41 or AD-42) for MSC manning on a trial basis. We believe two years would be necessary to establish operating procedures and to experience a normal six-month overseas deployment.

There are several reasons for preferring that the trial be conducted with one of the new construction ships, rather than with the GOMPERS or PUGET SOUND. Because both of the new ships are in early stages of construction, with completions scheduled for not earlier than 1980, modifying the ships to satisfy MSC habitability standards would cost much less than modifying either of the existing ships. Furthermore, transfer of one of the new construction ships to MSC would not disrupt an existing military organization—both the MSC crew and the MILDEPT would be new organizations on a new ship. Selection of one of the new tenders in lieu of GOMPERS or PUGET SOUND would delay the trial for a couple of years. GOMPERS and PUGET SOUND will be due for regularly scheduled overhauls in 1978 and 1979, and then would be an opportune time to transfer either of these ships to MSC. However, the advantages of MSC ownership are long term, and the short delay would not be detrimental.

APPENDIX A

TYPICAL MAINTENANCE SUPPORT CAPABILITIES OF DESTROYER TENDERS AND REPAIR SHIPS

Technical Library
Drafting Services
Quality Assurance
Printing Shop
Photo Service
Product Analysis[1]
Tool/Safety Equipment Loan Service
Engraving Shop
Watch and Clock Shop
Inside Machine Shop
Outside Machine Shop
Welding Shop
Patternmaker Shop
Foundry[2]
Structural Shop
Pipe Shop
Boiler Shop
Boat Repair
Sheetmetal Shop
Lagging Shop
Air Conditioning & Refrigeration Shop
CO_2 Recharging and Repair Shop
Typewriter Shop
Electrical Shop
Internal Combustion Engine Shop
Woodworking Shop
Rigging Shop
Sail Loft
Divers' Shop
Mechanical Instrument Calibration Shop (MIRCS)
Instrument Shop
Nondestructive Test Laboratory
Gyro Shop
Optical Shop
Interior Communications Shop
Teletype Shop
Electronics Shop[3]
Electronics Calibration Shop
Gun and Launcher Shop[4]
Torpedo Shop[5]
Fire Control Shop
Sonar Shop[5]
Cryptographic Shop
RADIAC Calibration Shop
Nuclear Propulsion Repair[5]

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[1]Analysis of feedwater, boiler water, lubricating oil and fuel (performed by Ship's Engineering Department)

[2]Repair ships have a greater capability than tenders for foundry work and diesel engine repair.

[3]Tenders have more extensive electronics repair capabilities than repair ships.

[4]Tenders have a greater ordnance capability than repair ships.

[5]Tenders only.

APPENDIX B

PLANNED PEACETIME OPERATING PROFILE

A. BACKGROUND

The destroyer tender operating profile presented in this section is based on the planned peacetime utilization of such ships by the U. S. Atlantic Fleet. The operating profile is a key assumption in this study. The data were obtained from Commander, Naval Surface Force U.S. Atlantic Fleet.

B. SIGNIFICANT OPERATIONAL ACTIVITIES

The planned operational usage of destroyer tenders is characterized by the following key activities:

1. Deployments

The Atlantic Fleet rotates its five destroyer tenders through a six-month deployment in the Mediterranean Sea. Thus, for each ship, there is a period of about two years from the end of one overseas deployment to the beginning of the next. A typical deployment includes 11 days enroute, six-months providing services to tended ships (steam, electricity, water, boat services, messing as necessary, etc.), with relocation as necessary to support fleet operations, and 11 days return to homeport.

2. Out-of-Homeport Tending

Approximately once every 8 months each tender will relocate from its homeport to another East Coast port (e.g., Newport, Rhode Island; Earle, New Jersey; Charleston, South Carolina; Mayport, Florida; Pensacola, Florida) for a period of 6-8 weeks to support ships homeported in that area. Normally, out-of-homeport tending is accomplished with benefit of pier services.

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3. Independent Ship Exercises (ISE)

Once each quarter each tender conducts underway exercises for a period of 5-10 days. Whenever practical, ISE are conducted in conjunction with underway requirements of out-of-homeport tending and other ship movements.

4. Board of Inspection and Survey (INSURV)

Once every three years the tender undergo a material condition and readiness inspection of one week duration. An ISE period is required just prior to the INSURV.

5. Overhaul

The planned overhaul cycle for destroyer tenders is 53 months—48 months from the end of one overhaul to the beginning of the next, and an overhaul duration of five months.

6. Refresher Training

Following each overhaul, there is a 4-5 week deployment to the Caribbean Sea for inspections, training, gunnery, etc.

7. Self-Availabilities

These are periods of scheduled intermediate maintenance for the tender. Although the repair department also may be tending other ships during this period, there is a scheduled work package on the tender itself which the repair department is committed to accomplish. Availabilities of four weeks duration are scheduled by the following priorities:

- Pre-deployment
- Post-deployment
- INSURV
- Pre-overhaul
- No less than every six months

8. Homeport Tending

When not involved in the above seven activities, tenders are tending ships at homeport where pier services are generally available.

C. PEACETIME OPERATING PROFILE

Figure B-1 portrays the current operational usage of destroyer tenders in the U. S. Atlantic Fleet. The schedule accounts for the significant operational activities over a period of time sufficient to reflect all planned events. An MSC operated and maintained tender would probably not require self-availabilities, extensive refresher training or ISE. Instead, this time would be available for tending other ships. In addition, MSC practice is to overhaul/drydock a ship every other year for a period of about one month, with interim repair availabilities of about 20 days each in the intervening years.

D. SPECIAL CIRCUMSTANCES

There are two special aspects of destroyer tender operations which have an impact on the manning and manpower costs associated with MSC operation of these ships. The first concerns ammunition; the other concerns boat operations.

1. Ammunition

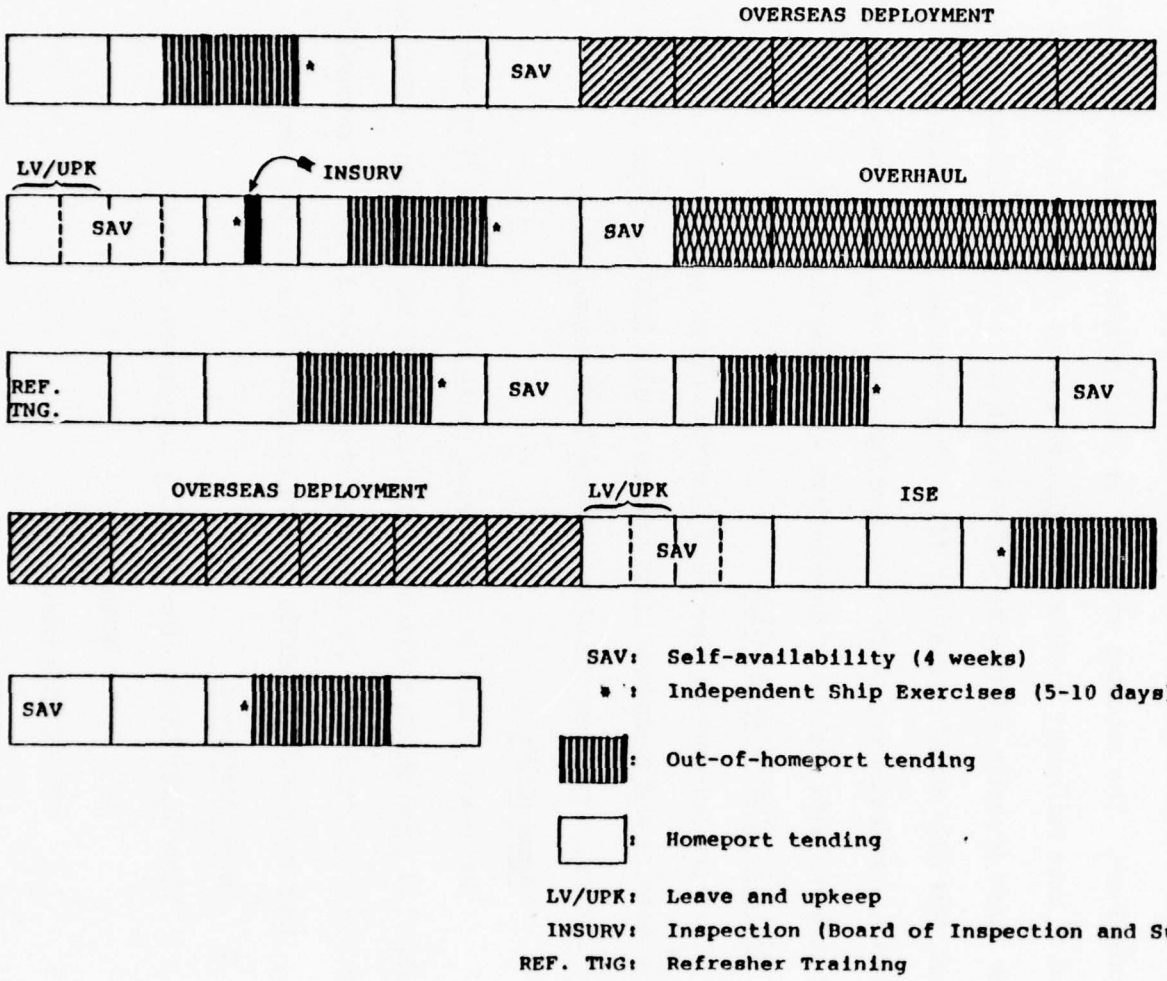
Whenever a MSC manned vessel contains more than fifty (50) measurement tons (M/T) of ammunition, a 10% bonus must be paid to the MSC crew. Because destroyer tenders (AD-37 Class) have the capacity for more than 50 M/T of ammunition, the cost calculations in Appendix E include ammunition bonuses for the MSC crew.

2. Boat Operations

The GOMPERS has the following complement of boats:

26'	Motor Whaleboat	4
40'	Utility Boat	4
50'	Utility Boat	2
33'	Personnel Boat	3
LCM(6)	Landing Craft Medium-Type 6	2
		15

FIGURE B-1. TYPICAL OPERATING PROFILE
53-MONTH CYCLE



One of the LCM(6) boats is normally fitted out for diving operations and would be the responsibility of the Repair Department. MSC would be responsible for the operation and maintenance of all other boats, as well as the boat cranes, winches, and davits.

In CONUS ports, boat services normally are not required, although they must be available on call. However, during deployments, boats are used extensively to transport personnel and stores to and from shore and to transport technicians, tools, and equipment to and from tended ships. It is the experience of PIEDMONT and PUGET SOUND while deployed in the Mediterranean Sea that boat services require a minimum of four boats, twenty-four hours a day, seven days a week.

APPENDIX C

ASSIGNMENT OF FUNCTIONS AND ESTIMATES OF MANNING

A. PURPOSE

This analysis develops manpower requirements for MSC operation of a destroyer tender with a military department embarked to provide the repair, weapons logistics, and other services to tended ships. Basically, this entails MSC assumption of those functions currently associated with command and control, deck department (less gunnery), engineering department, and messing.

B. APPROACH

The method selected for this analysis is a case example. The particular ship is a GOMPERS class destroyer tender. The operating environment is the Atlantic Fleet. The following documents were used to identify the ship's characteristics, missions, capabilities, and planned utilization:

- Booklet of General Plans (AD-37)
- NWIP 11-20 (C), "Missions and Characteristics of U.S. Navy Ships and Aircraft"
- OPNAVINST 3501.2D, "Naval Combat Readiness Criteria"
- OPNAVINST 08010.248A, "Characteristics of Destroyer Tender (AD-37)"
- OPNAV Manpower Authorization (AD-37)
- Planned Operating Profile for U.S. Atlantic Fleet Destroyer Tenders
- Discussions with headquarters and fleet personnel

There is no convenient single source of specific functions to be performed aboard destroyer tenders. For example, Ship Manning Documents (which display the rationale for manning predicated upon ship's configuration, workload, and given operating profile) have not been developed for these ships. The use of OPNAVINST 3501.2D in concert with NWIP 11-20(C) does provide descriptions of operational capabilities for the GOMPERS class.

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For example, that instruction lists one mission area as "Mobility" with the particular requirement for "MOB 1: Steam to designed capability." Such a statement in itself is insufficient to determine required manpower. However, such statements in connection with the Booklet of General Plans which shows the arrangement of machinery spaces and type of propulsion or arrangement of line-handling stations could, in light of past experience, provide enough information for making rough approximations. In such cases, functional requirements are inferred and manning levels are estimated based on those inferences. In other cases, where workload is based primarily on the number of personnel serviced (e.g., messing), specific functional requirements were ignored and manning levels (e.g., for cooks) were estimated primarily on the basis of crew size.

C. FUNCTIONAL ASSIGNMENTS

1. General

MSC will operate and maintain the ship as a "platform" for the embarked Navy military department. "Operate" includes deck seamanship, getting under way, maneuvering, controlling, navigating, anchoring, mooring, and prolonged steaming. "Maintain" includes all upkeep and repair of the vessel.

In general, the embarked MILDEPT would be responsible for those functions currently performed by the repair department, weapons logistics department, medical and dental departments, and their supply and administrative support. In addition, the MILDEPT will retain responsibility for communications, signalling, gunnery, and the combat information center (CIC).

2. Specific Functions Assumed by MSC

Other than those functions associated with "running the ship," as briefly outlined above, MSC will assume the following specific functions:

a. Safety and security of the ship and embarked personnel (e.g., quarterdeck and pier watches). Joint MSC/MILDEPT bills required for damage control, firefighting, etc.

b. Provision of hotel services (i.e., steam, electricity, water, and compressed air) to the MILDEPT and tended ships.

c. Facility maintenance of the entire ship, except daily custodial services of MILDEPT operating and berthing spaces.

d. Equipment maintenance, except:

1) equipment for communications and CIC

2) fire control systems

3) guns, gun mounts, and missile systems

4) ADP equipment

5) interior communication systems (i.e., all IC functions, except for gyro compass and repeaters)

6) industrial plant equipment, labor-saving devices, tools, and test equipment belonging to the MILDEPT.

e. Messing and berthing of all military and civilian personnel, including embarked staff and transients.

f. Operation of materials handling equipment (booms, cranes, winches, forklift trucks, elevators, conveyors, monorails, etc.), except within MILDEPT spaces (e.g., torpedo handling).

g. Operation of UNREP gear

h. Operation and maintenance of boats, except the diving boat

i. Command and administration of MSC personnel

3. Specific Functions Retained by the MILDEPT

Other than those functions associated with the repair, weapons logistics, medical, and dental departments, and their supply and administrative support, the MILDEPT will retain the following specific functions:

a. Command and administration of military personnel and activities

b. Communications (radio, teletype, signalling, interior communications and alarm systems)

c. Gunnery (manning of gun mounts, missiles, armory)

d. Combat Information Center

e. Ship's services for military personnel (laundry, dry cleaning, tailor, barber, ship's store, clothing and small stores, ice cream bar, etc.)

f. Postal services for both MSC and the MILDEPT

g. Disbursing for military personnel

h. Security for MILDEPT spaces and special weapons

i. Operation and maintenance of the diving boat

j. Cleanliness of MILDEPT work and living spaces

k. Assistance to higher authority in the conduct of material condition inspections of other Navy ships

l. Nuclear weapons emergency response team

D. MANNING LEVELS

1. Navy Enlisted Personnel

The current manpower authorization document[1] for GOMPERS lists 1,026 authorized enlisted billets. Of that total 487 are authorized for the Repair and Weapons Logistics Departments; the other 539 billets are authorized for other departments. Since repair and weapon logistics are the primary functions of the proposed MILDEPT, the billets authorized for those departments would remain unchanged. Generally, the 539 billets authorized for the other departments are open to review and proposed revision.

Table C-1 summarizes the distribution of the 539 billets by rating and the proposed disposition of those billets. Of the 539 billets authorized outside of the Repair and Weapons Logistics Departments, 167 are proposed for the MILDEPT. These billets are primarily for staffing of functions associated with medical, dental, supply support of the

[1]Manpower Authorization for USS SAMUEL GOMPERS (AD-37), OPNAV 1000/2, March 9, 1976.

TABLE C-1. RATIONALE FOR REDUCTION IN AUTHORIZED ENLISTED PERSONNEL

Rating	Authorized for Departments Other Than Repair & Wpn. Log.	To be Retained in Proposed MILDEPT	To be Eliminated by Transfer of Function to MSC	Rationale
Boatswain's Mate (BM)	21	1	20	MSC to assume the functions of the Deck Dept. One BM retained as coxswain for the diving boat.
Master-at-Arms (MA)	1	1		Navy to retain Master-at-Arms
Quartermaster (QM)	4		4	MSC to assume the functions of navigation and tactical maneuvering
Signalman (SM)	6	6		Navy to retain signalling capability
Operations Specialist (OS)	6	6		Navy to retain functions of the Combat Information Center
Sonar Technician (ST)	1	1		Navy to retain Sonar Technician
Gunner's Mate (GM)	3	3		Navy to retain gunnery operation and maintenance
Fire Control Technician (FT)	3	3		Navy to retain fire control operation and maintenance
Data Systems Technician (DS)	5	5		Navy to retain ADPE maintenance
Navy Career Counselor (any rating) (NC)	1	1		Navy to retain Career Counselor
Radioman (RM)	14	14		Navy to retain communications capability
Yeoman (YN)	7	6	1	Navy to retain administrative/clerical capability for Navy personnel only. MSC to provide own administrative/clerical support
Personnelman (PN)	12	8	4	Navy to retain personnel record-keeping capability but with capacity reduced in proportion to Navy crew reduction
Data Processing Technician (DP)	18	18		Navy to retain ADPE operations
Storekeeper (SK)	26	21	5	Navy to retain storekeeping capability but with capacity reduced on the assumption that 20% of workload is not for support of repair functions
Disbursing Clerk (DK)	4	3	1	Navy to retain payroll and disbursing capability in proportion to Navy population served
Mess Management Specialist (MS)	37		37	MSC to assume food service operation for all embarked Navy and MSC personnel. Removed SN/FN assigned to WR rotational pool

TABLE C-1. RATIONALE FOR REDUCTION IN AUTHORIZED ENLISTED PERSONNEL (Continued)

Rating	Authorized for Departments Other Than Repair & Wpn. Log.	To be Retained in Proposed MILDEPT	To be Eliminated by Transfer of Function to MSC	Rationale
Ships' Serviceman (SH)	20	15	5	Navy to retain ship's service functions and sales outlets with reduction in capacity in proportion to Navy crew reduction. Similar functions for MSC crew to be provided by MSC.
Journalist (JO)	1	1		Navy to retain Journalist for CCTV
Postal Clerk (PC)	3	3		Navy to retain postal service capability. No reduction in capacity made so that Navy can provide postal service to MSC personnel
Machinist's Mate (MM)	23		23	MSC to assume the functions of the Engineering Dept.
Engineman (EN)	10		10	MSC to assume the functions of the Engineering Dept.
Boiler Technician (BT)	19	1	18	MSC to assume the functions of the Engineering Dept. (One individual retained as a designated 3-M System Maintenance Operations Manager)
Electrician's Mate (EM)	16	1	15	MSC to assume the functions of the Engineering Dept. (One individual retained as a designated 3-M System Maintenance Operations Manager)
Interior Communications Specialist (IC)	7	7		Navy to retain all Interior Communications capability for maintenance of all IC equipment except the gyro compass and repeaters. MSC to assume gyro responsibilities.
Hull Technician (HT)	25		25	MSC to assume the functions of the Engineering Dept.
Hospital Corpsman (HM)	12	12		Navy to retain medical service capability
Dental Technician (DT)	8	8		Navy to retain dental service capability
Seaman (SN)	109	16	93	Removed all SN/SA assigned to the Deck Dept. MSC to assume the functions of the Deck Dept.
Seaman Apprentice (SA)	49	6	43	Removed some SN/SA assigned to Admin., Ops., & Supply in proportion to other personnel reductions in those departments
Fireman (FN)	46		46	Removed all FN/FA assigned to Engineering Dept. MSC to assume the functions of the Engineering Dept.
Fireman Apprentice (FA)	22		22	Removed all FN/FA assigned to Engineering Dept. MSC to assume the functions of the Engineering Dept.
TOTALS	539	167	372	

repair mission, administration, and personnel support. The remaining 372 billets are proposed for elimination. These billets are primarily associated with command and control, deck and engineering departments, and the messing function. Proposed MSC manning levels are predicated primarily on the functions associated with the billets to be removed. MSC manning estimates are presented in Paragraph D.3 of Appendix C.

Tables C-2 through C-4 reflect the steps taken in arriving at the rating totals summarized in Table C-1. Table C-2 displays the distribution, by rate and rating, of the 539 billets authorized for the departments other than Repair and Weapons Logistics. Tables C-3 and C-4, Proposed Retentions and Proposed Removals, respectively, are presented to display the detailed disposition of the 539 billets under question. These tables reflect the consideration given to retention of appropriate mixes of levels of skills and adequate supervisory personnel deemed suitable for each rating proposed for retention.

2. Navy Officer Personnel

Based on current documents,[2] the GOMPERS has 35 officer billets authorized. These billets are distributed in the ship's organization as shown in the first column of Table C-5. Because the Navy MILDEPT would retain the functions of repair, weapons logistics, medical, dental, and portions of supply and administration/personnel support, most of the officer billets associated with those functions would remain with the MILDEPT. These billets are shown in the second column of Table C-5. The remaining authorized officer billets (the third column of Table C-5) are susceptible to elimination. The specific billet titles and authorized pay grades proposed for elimination are shown in Table C-6.

[2]Manpower Authorization for USS SAMUEL GOMPERS (AD-37), OPNAV 1000/2, June 25, 1976.

TABLE C-2. PRESENT AUTHORIZED BILLETS
(Except Repair and Weapons Logistics Department)

Rating \ Rate	E-9	E-8	E-7	E-6	E-5	E-4	E-3	E-2	Rating Totals
BM	1		2	3	6	9			21
MA			1						1
QM			1	1	1	1			4
SM			1	1	1	3			6
OS			1	1	2	2			6
ST					1	1			1
GM				1	1	1			3
FT				2	1				3*
DS				2	2	1			5
NC			1						1
RM			1	2	2	7	2		14
YN		1			1	2	3		7
PN	1			2	3	2	4		12
DP			1	2	4		8		18*
SK	1	1	1	3	9	11			26
DK		1		1	1	1			4
MS		1	2	6	10	14	4		37
SH			1	3	5	7	4		20
JO						1			1
PC				1	1	1			3
MM			1	4	7	11			23
EN			1	2	3	4			10
BT	1			4	6	8			19*
EM			1	3	4	8			16*
IC		1		1	2	3			7
HT	1			2	10	12			25
HM		1		2	3	4	2		12
DT			1	1	2	2	2		8
SN							109		109
SA								49	49
FN							46		46
FA								22	22
Rate Totals	5	6	17	50	87	124	179	71	539

*One E-6 of this rating is designated a 3M System Maintenance Operations Manager. (Seven such individuals are assigned by following ratings: EM, FT, BT, DP, MM, HT, and ET of which the latter three are assigned to the Repair Department.)

TABLE C-3. PROPOSED RETENTIONS
(In Addition to Repair/Weapons Logistics Department)

Rate / Rating	E-9	E-8	E-7	E-6	E-5	E-4	E-3	E-2	Rating Totals
BM					1				1
MA			1						1
QM									
SM			1	1	1	3			6
OS			1	1	2	2			6
ST						1			1
GM				1	1	1			3
FT				2	1				3*
DS				2	2	1			5
NC			1						1
RM			1	2	2	7	2		14
YN		1			1	1	3		6
PN				1	2	1	4		8
DP			1	2	4	8	3		18*
SK	1		1	2	7	10			21
DK				1	1	1			3
MS									
SH			1	2	3	5	4		15
JO						1			1
PC				1	1	1			3
MM									
EN									
BT				1					1*
EM				1					1*
IC		1		1	2	3			7
HT									
HM		1		2	3	4	2		12
DT			1	1	2	2	2		8
SN							16		16
SA								6	6
FN									
FA									
Rate Totals	1	3	9	24	36	52	36	6	167

*One E-6 of this rating is designated a 3M System Maintenance Operations Manager. (Seven such individuals are assigned by following ratings: EM, FT, BT DP, MM, HT, and ET of which the latter three are assigned to the Repair Department.)

TABLE C-4. PROPOSED ELIMINATIONS

Rate Rating	E-9	E-8	E-7	E-6	E-5	E-4	E-3	E-2	Rating Totals
BM	1		2	3	5	9			20
MA									
QM			1	1	1	1			4
SM									
OS									
ST									
GM									
FT									
DS									
NC									
RM									
YN						1			1
PN	1			1	1	1			4
DP									
SK		1		1	2	1			5
DK		1							1
MS		1	2	6	10	14	4		37
SH				1	2	2			5
JO									
PC									
MN			1	4	7	11			23
EN			1	2	3	4			10
BT	1			3	6	8			18
EM			1	2	4	8			15
IC									
HT	1			2	10	12			25
HM									
DT									
SN							93		93
SA								43	43
FN							46		46
FA								22	22
Rate Totals	4	3	8	26	51	72	143	65	372

TABLE C-5. RATIONALE FOR REDUCTION IN AUTHORIZED OFFICER PERSONNEL

Officer Billets	Authorized	Retained in MILDEPT	Eliminated	RATIONALE
Command and Executive Staff	4	3	1	Command and Executive Billets (2) to be eliminated; MSC to assume command of ship. Navy to retain billets (2) for admin/legal and Chaplain. Additional billet for C.O. of proposed MILDEPT to be added. Net effect is to eliminate one officer billet.
Operations	2	1	1	Operations/Navigator billet to be eliminated; MSC to assume functions of navigation. Navy to retain Communications billet.
Deck	2	0	2	Deck Dept. billets to be eliminated; MSC to assume the functions of the Deck Dept.
Engineering	3	0	3	Engineering Dept. billets to be eliminated; MSC to assume functions of the Engineering Dept.
Repair & Weapons Logistics	13	13	0	Navy to retain all billets for the Repair and Weapons Logistics Departments.
Supply	5	4	1	Food Services billet to be eliminated; MSC to assume the food service function. All other Supply Dept. billets to be retained by Navy.
Medical and Dental	6	6	0	Navy to retain all Medical and Dental billets.
Totals	35	27	8	

TABLE C-6. OFFICER BILLETS PROPOSED FOR ELIMINATION

Billet Title	Pay Grade	Number
Commanding Officer	0-6	1
Operations/Navigator	0-3	1
First Lieutenant	0-3	1
Ship's Boatswan	CW0-2	1
Engineer	0-3	1
Damage Control	CW0-2	1
Main Propulsion	CW0-3	1
Food Services	0-1	1
		8

3. Military Manpower Summary

Table C-7 summarizes the result of the analysis of military manpower authorizations for a GOMPERS class tender.

TABLE C-7. SUMMARY OF MILITARY MANNING FOR A GOMPERS CLASS DESTROYER TENDER

	Officers	CPO	Other Enlisted	Total
Authorized	35	79	947	1061
Removed (Functions assumed by MSC)	8	15	357	380
Retained (Functions kept in MILDEPT):	27	64	590	681
Repair/Weapons Logistics	(13)	(51)	(436)	(500)
Command & Support Services	(14)	(13)	(154)	(181)

4. MSC-Civil Service Mariners

Based upon the description of functions proposed for transfer to MSC, as outlined earlier, and other factors,[3] MSC has made a preliminary estimate of the

[3]Examples of other factors which were considered are ship characteristics and mission, planned utilization, number of Navy personnel to be supported, union agreements, MSC operating practices, and past experiences.

manpower required to operate and maintain a GOMPERS class tender as a platform for the Navy MILDEPT. In general, the proposed MSC manning levels have been estimated to fulfill those functions normally associated with command and control, deck, and engineering departments, and the messing function. The information contained in Appendix B was used as a basis for operating tempo.

One factor of special interest which has a significant impact on manning is the requirement to provide boat services. In general, it is assumed that the requirement for boats is minimal in CONUS but quite demanding during overseas deployments.[4] As a result, it is assumed that MSC would normally man the ship at such a level as to be capable of providing minimal boat service. For the period of overseas deployment, MSC would augment the crew to provide the additional boat services.

Table C-8 is a summary of the MSC manning schedule for civil service mariners. That table provides manning estimates, by MSC departments, for officers, chief petty officers (CPO), and men. It shows the manning level expected for both CONUS operations and the augmented totals required for the additional boating requirements during the deployed activities of the ship. A more detailed manning breakout is displayed in Table C-9.

TABLE C-8. SUMMARY OF MSC MANNING

Department	Off.	CPO	Men	Total
Deck	5	3	18	26
Engine	5	7	14	26
Steward	5	2	86	93
Purser	2	0	0	2
CONUS TOTAL	17	12	118	147
Augmentation for Boat Operations during Deployments		2	8	10
DEPLOYMENT TOTAL	17	14	126	157

[4] Assumptions about boat services are given in Appendix B.

TABLE C-9. MSC MANNING SCHEDULE[1]

Dept.	Billet Title	Off.	CPO	Men	TOTAL
DECK	Master	1			
	1st Officer	1			
	2nd Officer	1			
	3rd Officer	2			
	Boatswain		1		
	Carpenter		1		
	Yeoman-Storekeeper		1		
	Boatswain Mate (Day)			(1)	
	Able Seaman			(4) 6	
	Able Seaman Maintenance			9	
	Ordinary Seaman			3	
	TOTAL	5	3	(5)18	(5)26
ENGINE	Chief Engineer	1			
	1st Assistant Engineer	1			
	2nd Assistant Engineer	1			
	3rd Assistant Engineer	2			
	Unlicensed Jr. Engineer		(2) 2		
	Electrician		1		
	Refrigeration Engineer		1		
	Plumber-Machinist		2		
	Yeoman-Storekeeper		1		
	2nd Electrician			(1) 2	
	Engine Utilitymen			(2) 2	
	Oiler			3	
	Fireman-Watertender			3	
	Wiper			4	
	TOTAL	5	(2) 7	(3)14	(5)26
STEWARD	Chief Steward	1			
	2nd Steward	1			
	3rd Steward	3			
	Chief Cook		1		
	Yeoman-Storekeeper		1		
	Cook-Baker			4	
	2nd Cook			4	
	3rd Cook			6	
	Messman			22	
	Utilityman			50	
	TOTAL	5	2	86	93
PURSER	Purser	1			
	Junior Purser	1			
	TOTAL	2	0	0	2
CONUS:	TOTAL MSC MANNING	17	12	118	147
	Augmentation for Boat Operations		(2)	(8)	(10)
DEPLOYED:	TOTAL MSC MANNING	17	14	126	157

[1]Numbers in parentheses indicate the additional MSC personnel required during overseas deployments to provide the boat services assumed by the schedule contained in Appendix B.

E. OTHER CONSIDERATIONS

One of the basic considerations of this study effort concerned military capability. Throughout the analysis, military capability was held constant. In that way, any potential benefits demonstrated by the analysis would not be obscured by degradation of capability.

However, transfer of fleet support ships to MSC in the past has been accompanied by elimination of capabilities for self-defense and complex tactical maneuvering. In the event that those capabilities could be eliminated in the transfer of destroyer tenders, 18 additional enlisted billets could be eliminated (see Table C-10). Table C-11 shows the distribution by rate and rating of the billets associated with the self-defense and tactical maneuvering.

TABLE C-10. CAPABILITIES ELIMINATED IN PAST SHIP TRANSFERS TO MSC

Capability	Current AD-37 Authorized Manning
Gunnery and Fire Control	6
Signalling	6
Combat Information Center (CIC)	6
	18

TABLE C-11. SKILL MIX ASSOCIATED WITH SELF-DEFENSE & TACTICAL MANEUVERING

Capability	Rate / Rating	E-9	E-8	E-7	E-6	E-5	E-4	E-3	E-2	Ratings Totals
Gunnery &	GM				1	1	1			3
Fire Control	FT				2	1				3
Signalling	SM			1	1	1	3			6
CIC	OS			1	1	2	2			6
TOTALS		0	0	2	5	5	6	0	0	18

APPENDIX D

ESTIMATES OF MILITARY BILLET COSTS

A. INTRODUCTION

This Appendix outlines the procedures used to estimate the marginal cost to the Government of providing military manpower, in the grades and skills authorized, for those billets which would be eliminated from a GOMPERS class tender if the ship were transferred to MSC. The rationale for elimination of billets is discussed in Appendix C.

B. ENLISTED BILLET COSTS

The basis for estimating the annual costs of enlisted billets is the Navy Billet Cost Model. The cost elements included in the model, together with typical costs for an enlisted billet (E-4 Hull Technician) are shown in Table D-1. In using the model, it was recognized that the model, because it averages some costs across the whole Navy (e.g., sea and foreign duty pay), is not tailored to the specific operating profile assumed for tenders and repair ships. However, the aberrations are small, and, since it was not feasible to modify the model to eliminate them, the model results were accepted.

It was necessary, however, to make several adjustments to the output of the Billet Cost Model to eliminate costs which are considered to be fixed (i.e., not variable with the number of billets in the Navy), to update costs to calendar year 1976, and to add costs not included in the model. Table D-2 shows the billet costs, by rate and rating, as produced by the Billet Cost Model. (The table includes costs only for those billets proposed for elimination as indicated in Table C-4, Appendix C). Table D-3 shows the adjustments made to derive a calendar year 1976 estimate of the annual, marginal cost to the Government of the enlisted billets on a GOMPERS class tender which would be eliminated by transfer of the ship to MSC.

TABLE D-1. NAVY BILLET COST MODEL ESTIMATES:
E-4 HULL TECHNICIAN

Cost Element	Annual Cost	Remarks
Base Pay	$ 5,555	Pay scales as of 31 October 1974
Hazard Pay	0	Pro rata fraction in dollars of eligible ratings receiving aviation or diver's incentive pay
FICA	324	Employer's contribution to FICA
Constant Cost by Grade	1,652	Quarters or quarters allowance, clothing allowance, family separation allowance, dependency and indemnity compensation, dependent schools, sea duty and foreign duty pay
Pro-pay	0	Pay for special duty assignment, superior performance or working in a shortage specialty
Constant Cost by Year	1,759	Medical costs, subsistence, unemployment compensation, insurance on FHA housing loans, command and administration costs
Transportation Cost	463	PCS and TAD school travel
Re-enlistment Bonus and Settlement Leave	0	Terminal leave, separation allowance and reenlistment bonus
Retirement Contribution	65	Estimated annuity apportioned by probability of retirement
Down Cost	1,892	Ammortized personnel pipeline and school costs
Billet Cost	$11,710	

TABLE D-2. NAVY BILLET COST MODEL ESTIMATES OF ANNUAL BILLET COSTS

(Approximately CY1975 Dollars)

Rate / Rating	E-9	E-8	E-7	E-6	E-5	E-4	E-3	E-2
BM	30,393		20,468	17,196	14,122	11,474		
QM			20,448	16,905	13,850	11,523		
YN						11,142		
PN	28,061			17,835	14,011	11,608		
SK		22,889		18,314	14,282	11,080		
DK		22,864			13,875			
MS*		25,400	21,145	17,007	13,882	11,344	9,903	
SH				18,745	14,378	11,697		
MM			20,414	16,862	13,449	11,002		
EN			21,008	17,850	13,906	11,513		
BT	25,596			18,307	14,337	11,835		
EM			20,587	17,358	13,461	10,996		
HT	27,767			17,293	13,795	11,710		
SN*							10,003	
SA*								9,639
FN*							9,984	
FA*								9,582

The version of Billet Cost Model outputs used for this study did not include all ratings for which cost estimates were needed. Therefore, for the purpose of estimating billet costs, the following substitutions were made: CS for MS, BMSN for SN, BMSA for SA, MMPN for PN, and MMFA for FA

TABLE D-3. DERIVATION OF THE ESTIMATE OF ENLISTED BILLET COSTS

Remarks	E-9	E-8	E-7	E-6	E-5	E-4	E-3	E-2	Total
Number of Billets	4	3	8	26	51	72	143	65	372
Total Billet Cost Model Estimate	111,817	71,153	165,683	452,800	708,288	821,071	1,429,155	625,281	4,385,248
Average Billet Cost	27,954	23,718	20,710	17,415	13,888	11,404	9,994	9,620	11,788
Fixed Command and Administration Costs[1]	- 880	- 880	- 880	- 880	- 880	- 880	- 880	- 880	- 880
Average Cost Adjusted to CY1976 (1.05 Adjustment)	28,428	23,980	20,822	17,362	13,659	11,050	9,570	9,177	11,453
Federal Tax Advantage[2]	905	693	667	662	599	537	467	433	518
Average Adjusted Billet Cost	29,333	24,673	21,489	18,024	14,257	11,587	10,037	9,610	11,971
Adjusted Total Estimate	117,332	74,018	171,912	468,628	727,127	834,260	1,435,248	624,650	4,452,171

1. Per conversation with LCDR L.S. Mairs, Assistant for Enlisted Force Management Systems Analysis, Bureau of Naval Personnel.

2. House of Representatives, Op. Cit., p. 370.

C. OFFICER BILLET COSTS

At the time of this study, estimates of officer billet costs were not available from the Navy Billet Cost Model. Therefore, the estimates used were those of total regular military compensation (RMC) and benefits as presented to the House of Representatives by the Assistant Secretary of Defense (Manpower and Reserve Affairs).[1] Table D-4 is a summary of the estimates for those officer billets which would be eliminated by transfer of a GOMPERS class tender to MSC.

TABLE D-4. ANNUAL COST OF OFFICER BILLETS ELIMINATED BY TRANSFER

(Pay Scales as of October 1, 1975)

Authorized Grade	Number of Billets	RMC[1]	Benefits[2]	Sum RMC and Benefits	Total
0-6 Captain	1	35,534	7,413	42,947	42,947
0-3 Lieutenant	3	18,750	4,896	23,646	70,938
0-1 Ensign	1	11,102	2,930	14,032	14,032
W-3 Chief Warrant Officer	1	18,542	4,864	23,406	23,406
W-2 Chief Warrant Officer	2	15,807	4,344	20,151	40,302
TOTAL	8				191,625

[1]Regular military compensation (RMC) includes basic pay, quarters and subsistence allowances (either cash or in kind), and the Federal tax advantages.

[2]Benefits include the actuarial valuation of retirement, health care, commissary and exchange and the Government's contribution to Social Security.

[1]*U.S. House of Representatives, Committee on Appropriations.* Department of Defense Appropriations for 1977, Part 4, p. 371.

APPENDIX E

MILITARY SEALIFT COMMAND COST ESTIMATES

A. INTRODUCTION

At the request of LMI, MSC prepared gross estimates of the costs of modifying a GOMPERS class tender and operating it as part of the MSC Fleet Support Program. The estimates are approximations based on the operating profile, boat schedules, booklet of general plans, and descriptions of MSC functional responsibilities compiled by LMI. The estimated MSC manning requirements are in Appendix C.

B. INITIAL MODIFICATION, OVERHAUL, AND REPAIR COSTS

The estimated cost of accomplishing habitability modifications required for permanent MSC operation of a GOMPERS class destroyer tender is $4,780,000. The estimated shipyard performance period to accomplish the anticipated repair/modification work is 150 days. These "ball park" estimates were developed without a detailed design study or shipcheck and are predicated upon the following criteria based on a preliminary estimate of 158 MSC personnel:

- Senior MSC (6) and Navy contingent (6) will have single rooms with private toilet and shower.

- All remaining MSC licensed officers will have single rooms with semi-private toilet and showers.

- All remaining Navy officers will have 2-man rooms with semi-private toilet and showers.

- All MSC unlicensed personnel will have 2-man rooms with semi-private toilet and showers.

- Existing Navy enlisted and CPO berthing will remain the same.

- A central galley system will be established to serve the relocated MSC crew, officer and Navy personnel messing areas.

- Existing spaces eliminated by mess room modifications will be relocated into available unused Navy enlisted berthing areas.

Should the Navy wish to conduct a trial prior to investing in all modifications, it is estimated that the minimum modifications needed for such a trial would cost $1,700,000. This estimate assumes that the existing stateroom accomodations with community toilets and showers would be accepted by a MSC crew on a temporary basis. The estimated costs of the complete and partial modifications are outlined in Table E-1.

TABLE E-1. ESTIMATES OF MODIFICATION COSTS

	Complete Modifications	Minimum Modifications For Trial
12 Single staterooms with private toilets and showers	$ 360,000	N/A
13 Single staterooms with semi-private toilets and showers	$ 390,000	N/A
81 Two-man staterooms with semi-private toilets and showers	$2,835,000	N/A
44 two-man staterooms	N/A	$1,100,000
Galley Modifications	$ 75,000	$ 75,000
Wardroom Modifications (Dumb-waiter)	$ 30,000	$ 30,000
Crew Mess Modifications	$ 75,000	$ 75,000
Relocation of spaces eliminated by mess room modifications	$ 60,000	$ 60,000
Subtotal	$3,825,000	$1,340,000
25% Contingency	$ 956,500	$ 335,000
	$4,781,500	$1,675,000

Upon transfer of a ship to MSC, MSC normally accomplishes required repair work (including drydocking and modifications desired for operation with a reduced crew) prior to putting the ship into service. MSC estimates that this repair work would cost $1,500,000. It would be accomplished in conjunction with the habitability modifications and would be in lieu of the Navy regularly scheduled overhaul.

C. ANNUAL OPERATING EXPENSES

Table E-2 provides estimated operating expenses for 365 days while home ported in CONUS, East Coast, including all underway periods. The salary and fringe benefits are based on schedules of wages which were effective 16 June 1976. The estimated $930,000 for maintenance and repair is an average annual cost based on estimates of $1,200,000 for years in which biennial overhauls are accomplished and $660,000 for years in which overhauls are not accomplished. These estimates are outlined in Table E-3. MSC overhead is applied at 5% of direct operating expense.

Table E-4 provides the estimated additional cost for a six-month deployment to the Mediterranean. The additional costs are listed separately as the deployment is scheduled only once every 2½ years. The costs include the additional salary, fringe benefits, subsistence, repair and overhead costs which would be incurred if MSC augmented its crew to satisfy the active boat services schedule assumed for overseas deployments.

TABLE E-2. DESTROYER TENDER ESTIMATED ANNUAL OPERATION EXPENSE IN CONUS WITH MSC 147-MAN CREW[1]

SALARY AND FRINGE BENEFITS	($000)
Base Pay (16 June 1976 wage schedules)	$1,393
Overtime and Premium Pay	766
Ammunition Bonus[2]	139
Relief Officers	42
Leave--Annual/Sick/Shore	348
Retirement	98
Insurance--Life/Health	132
Social Security	1
Awaiting Assignment	3
Training	3
Damage Control Instruction	3
TOTAL SALARY AND FRINGE BENEFITS	$2,928
FUEL	251
SUBSISTENCE[3]	174
HOUSEHOLD EXPENSES	
Cash in lieu of Subsistence and Quarters	8
Consumable Supplies	240
Transportation of Supplies	33
Medical Expenses	2
Laundry	1
Port Expenses	3
Miscellaneous	5
TOTAL HOUSEHOLD COSTS	$ 292
MAINTENANCE AND REPAIR	930
MSC OVERHEAD	229
TOTAL RECURRING ANNUAL COSTS	$4,804

[1]Expenses of 40 days at sea are incorporated into estimate.

[2]It is assumed that a tender carries more than 50 M/T of ammunition thereby entitling the MSC crew to a 10% bonus.

[3]Reimbursable noncrew subsistence is estimated at $808,000.

TABLE E-3. ESTIMATED ANNUAL REPAIR AND MAINTENANCE COSTS

	Years With Overhaul/ Drydocking*	Years Without Overhaul/ Drydocking
Drydock	$ 250,000	N/A
Overhaul	500,000	N/A
Unprogrammed Alterations	130,000	$ 70,000
Ordinary Repairs	120,000	470,000
Extraordinary Repairs	200,000	120,000
	$ 1,200,000	$660,000

Annual Average $930,000

*Overhaul/drydocking would be accomplished biennially.

TABLE E-4. DESTROYER TENDER ESTIMATED ADDITIONAL OPERATING EXPENSES DURING 6-MONTH MEDITERRANEAN DEPLOYMENT

	($000)
Salary and Fringe Benefits*	105
Fuel	539
Subsistence (For Crew Augmentation)	6
Household Expenses	
Repatriation	45
Transportation of Supplies	15
Maintenance and Repair of Boats	10
MSC Overhead	36
Total Additional 6-Month Expenses	$756

*The boat services provided by a tender during an overseas deployment are much more active than the services provided in CONUS ports. MSC would meet the more demanding requirements by augmenting its crew (10 men) and incurring overtime expense for duty in excess of 40 hours of work a week.

APPENDIX F

COMPARISON OF MILITARY SEALIFT COMMAND AND CURRENT NAVY OPERATING COSTS

This appendix outlines the procedure used to estimate the net difference in operating cost which would result from transfer of a GOMPERS class destroyer tender to MSC. The analysis focuses only on the expected differences; no attempt was made to estimate total operating cost. Although the estimates prepared by MSC did address total MSC expenses (see Appendix E), this was done solely to facilitate estimation of overhead costs that MSC, operating as an industrial fund, would recover from the Navy customer. The only MSC cost elements used in the comparison are those needed for comparability with Navy billet costs (see Appendix D) and those which are peculiar to MSC operations (e.g., repatriation expenses and MSC overhead). All other operating costs (such as for fuel, maintenance, military billets not affected by the transfer, supplies, and port fees) were assumed to be unchanged by the transfer of the tender to MSC.

The operating profile (Appendix B) assumed for this analysis includes a six month deployment to the Mediterranean Sea every two and a half years. During this period, MSC would augment its crew and would incur a variety of other deployment expenses which would generate an increase in MSC overhead charges. In order to compare costs on an annualized basis, 20% of these extra costs of the overseas deployment were added to the estimated costs of annual operations in CONUS.

One other adjustment was made to place MSC estimates on a basis of full comparability with Navy billet costs. At the request of the Office of Management and Budget, the Civil Service Commission recently developed a cost factor which is intended to reflect the full cost to the Government of the Civil Service Retirement System. The system used to generate the factor not only acknowledges that the 7% employers' contribution for retirement is inadequate to fully cover the present cost of Civil Service

Retirement, but anticipates future changes in salaries, interest rates, and retirement benefits. The recommended factor is 24.7% of base pay. Because the Navy Billet Cost model includes the full cost to the Government of the Military Retirement System, MSC manpower cost estimates were adjusted to reflect the full cost of the Civil Service Retirement System.

The Calculations are summarized in Tables F-1 through F-3. The results indicate that transfer of a GOMPERS class tender to MSC would reduce annual costs to the Government by one million dollars.

TABLE F-1. ANNUAL COSTS OF MSC MANPOWER AND COSTS PECULIAR TO MSC CONUS OPERATIONS*

	($000)
Salary and Fringe Benefits	$2,928
Subsistence	174
Cash in Lieu of Subsistence and Quarters	8
Medical Expenses	2
Laundry	1
MSC Overhead	229
TOTAL	$3,342

*Extracted from Table E-2, Appendix E.

TABLE F-2. ADDITIONAL MSC COSTS OF A SIX MONTH DEPLOYMENT TO THE MEDITERRANEAN

(Manpower and Peculiar MSC Costs Only)*

	($000)
Salary and Fringe Benefits	$105
Subsistence	6
Repatriation	45
MSC Overhead	36
TOTAL	$192

*Extracted from Table E-4, Appendix E.

TABLE F-3. ESTIMATE OF NET DIFFERENCE IN COST BETWEEN PROPOSED MSC AND CURRENT NAVY OPERATIONS
(Thousands of Dollars)

Cost of Navy Billets Eliminated		
Officers (Table D-4)	192	
Enlisted (Table D-3)	4,453	4,645
Average Annual Costs of MSC Manpower and Peculiar MSC Expenses		
Annual Costs of CONUS Operations (Table F-1)	3,342	
Annualized Cost of Deployments (Table F-2)	53	
Adjustment to Reflect Full Cost to the Government of the Civil Service Retirement System	255	
		-3,635
NET DECREASE IN AVERAGE ANNUAL COST TO THE GOVERNMENT WHICH WOULD RESULT FROM TRANSFER OF TENDER TO MSC		$1,010

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This study examines a proposal for reducing the operating costs of the Mobile Logistic Support Force by transferring destroyer tenders and repair ships to the Military Sealift Command (MSC). The concept assumes that the ships would be operated and maintained by U.S. Civil Service Marine personnel, while responsibility for intermediate maintenance activities and most other support services would be retained by military personnel assigned to embarked military departments. The study focuses on a case example of a GOMPERS class destroyer tender operating in the Atlantic Fleet.

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