McCAFFERY & WHITENER, INC.
SOLUTIONS

READY RESERVE FORCE

CONTINGENCY CREWING

REQUIREMENTS STUDY

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Ships from the Government owned Ready Reserve Force (RRF), Fast Sealift fleet and future Large Medium Speed RO/ROs, are the main source of quick response shipping to deploy military forces in a national emergency. Their crews are drawn from the civilian mariner pool that crew the U.S. Flag Fleet which has been steadily decreasing in size. The projected dwindling supply of active mariners creates uncertainty about the assured ability to crew the government ships in an emergency. Several study conclusions were: continue program of having partial crews on ships categorized as in Reduced Operation Status, establish inter-union agreements to cross-level mariners when required, negotiate agreements that ensures all U.S. flag shipping will make their personnel on leave available to crew ships without prejudicing their current positions or seniority (Re-employment Rights), reduce RRF crew sizes and establishment of a future crewing program to ensure availability of qualified crews. Program options analyzed were drawing personnel from: the Naval Reserve, Military Sealift Command Civilian Mariner pool, and Maritime Administration Civilian Merchant Marine Mobilization Program.

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Contents

Contents

Contents

Contents

Appendices

Appendices

Figures

Tables

Tables

Executive Summary

The Ready Reserve Force is the largest source, both in number of ships and cargo carrying capacity, of quick response shipping to deploy military forces overseas. The ships are maintained and operated, under Maritime Administration contract, by commercial ship operators and kept in specified states of readiness to proceed to loading berths. When activated, they are placed under the operational control of the Military Sealift Command, the Naval Component of the U.S. Transportation Command.

Ready Reserve Force ships are not the only Government owned cargo ships which will be called upon in a crisis. Among these other ships are the Fast Sealift Ships and the Large Medium Speed RO/ROs being acquired and placed in Reduced Operating Status. All of these Government owned cargo ships rely on the same pool of available mariners to fill out their crews. Therefore, while they are not a part of the Ready Reserve Force, the Fast Sealift Ships and Large Medium Speed RO/ROs in Reduced Operating Status are indistinguishable from Ready Reserve Force ships in terms of crewing. For brevity, the total inventory of Government owned reserve shipping (Ready Reserve Force, Fast Sealift Ships and Large Medium Speed RO/ROs in Reduced Operating Status) will be referred to as the Reserve Sealift Fleet. However, because the Fast Sealift Ships and Large Medium Speed RO/ROs will likely have higher crewing priorities, the effects of any shortfalls in mariner availability will fall almost entirely on the Ready Reserve Force.

A major concern of Department of Defense strategic mobility planners is the assured availability, on short notice, of qualified crews to operate Ready Reserve Force ships. A major element of this concern is that the size of the active U.S. flag merchant marine, which provides the pool of qualified mariners to crew the Ready Reserve Force, is steadily decreasing and is already smaller than it was during the Persian Gulf War. However, the number of Government owned, commercially crewed ships in reserve status is envisioned to decrease only slightly during the next 10 years. The continually dwindling supply of active mariners and a much slower decrease in the demand for mariners to crew the Reserve Sealift Fleet create uncertainty about the assured ability to crew the entire Ready Reserve Force.

The Ready Reserve Force activations for Operation Desert Shield in 1990 were the first large scale tests of the ability to simultaneously crew large numbers of Ready Reserve Force ships. Apparent shortages of certain skilled personnel hindered crewing of some ships within the required times. One assessment of the Operation Desert Shield experience (Appendix A) stated that "The chief findings of the study are that a quantitative and qualitative manning problem exists and is becoming worse." This assessment suggested that some potential crewing shortfalls could be met by crewing a number of Ready Reserve Force ships with members of the U.S. Naval Reserve's Merchant Marine Reserve program.

This study is organized in four parts. The first (Part 1) analyzes the requirement for a Ready Reserve Force contingency crewing program. Next, in Part 2, the feasibility of using Naval Reserve personnel to crew a portion of the Ready Reserve Force is analyzed. In Part 3, the Naval Reserve contingency crewing program developed in Part 2 and three other potential contingency crewing programs are subjected to both quantitative and qualitative analysis. These analyses seek to answer the following questions:

- What kind of contingency crewing program, if any, should be used for the Ready Reserve Force?
- How large must a Ready Reserve Force contingency crewing program be?
- What is the most effective means of ensuring that Ready Reserve Force ships are crewed when they are needed?

Finally, the conclusions resulting from the analyses in the first three sections are presented in Part 4.

Part 1 - ANALYSIS OF READY RESERVE FORCE CREWING REQUIREMENTS AND MARITIME LABOR AVAILABILITY

This portion of the study seeks to answer two fundamental questions. First, is sufficient maritime labor available to crew the Reserve Sealift Fleet, including the Ready Reserve Force? Second, if there is a shortfall of maritime labor to crew these ships, how great is the shortfall and in what areas? These questions will be resolved by analyzing the number of commercial mariners available to crew the Reserve Sealift Fleet relative to the crewing needs of the current and projected Reserve Sealift Fleet. The crewing demand was assessed for four different cases within each of two scenarios. Sensitivity analyses were conducted for each of the major assumptions.

Within the commercial sector are what may be considered five general labor sources or pools. The membership of each pool is fluid, varying with a number of conditions. These labor pools may be defined as follows:

- **Supportable** - This pool of mariners can be considered to be fully employed, based on the number of shipboard billets available and the applicable vacation rotation for those billets.
- **Active/Under-Employed** - These mariners are still actively seeking, and dependent upon, seagoing employment but are in excess to the number that is supportable by the active merchant fleet. They are in the process of deciding whether to find other full time employment or accept long-term partial employment.

- **Occasional** - These individuals are no longer completely dependent upon seagoing employment. However, they may take advantage of temporary maritime employment opportunities to augment their income while transitioning to full time employment ashore.

- **Qualified/Non-Active** - This pool is made up of those who have full time employment ashore and are no longer dependent in any way upon seagoing employment. However, they have not let their licenses or certifications lapse and are, therefore, still qualified.

- **Semi-Qualified** - These are individuals much like the "Qualified" labor pool but who have let their licenses or certifications lapse. While basic skills and knowledge are retained, re-licensing/certification and some remedial training would be required before they could return to sea.

The only labor pool whose size can be determined, and forecast, with any measure of confidence and accuracy is the "Supportable" labor pool because it is tied directly to shipboard billets and vacation schedules. The others cannot be measured, or forecast, with any assurance of accuracy. Further, even if the size of these other pools could be precisely quantified, the numbers are constantly changing and extrapolation would have questionable validity.

Because the size of the "supportable" or fully employed maritime labor pool varies directly with the number of seagoing billets available and their vacation rotation, the first step in the analysis was to project the size of the active U.S.-flag merchant marine for each year from 1994 to 2005. Fleet projections were made for two scenarios. The first or base scenario (Scenario I) assumes that no new subsidy program, such as the Maritime Security Program, is enacted to replace the current Operating Differential Subsidy program. The second (Scenario II) assumes that a replacement subsidy program is enacted. The latter scenario projects a net gain (retention) of 47 U.S. flag commercial ships through the year 2005. Both scenarios incorporate the Maritime Administrator's "Forecast of U.S. Flag Privately Owned Dry Cargo [Liner] Fleet"; projections of the dry bulk and tanker fleets are based on the Maritime Administration's "Life Rules" for merchant ships.

Reserve Sealift Fleet size projections assumed the acquisition of an additional 5 RO/ROs from commercial sources and the phasing out of 40 ships (34 dry cargo and 6 tankers). The projections also account for Reserve Sealift Fleet ships in active service supporting pre-positioning programs. When these ships are in active service they are part of the Active Fleet; they are returned to the Reserve Sealift Fleet upon their scheduled deactivation. These projections, based on Reserve Sealift Fleet plans as of June 30, 1995, are summarized in Table A.

The estimated numbers of mariners who would likely be available to crew Reserve Sealift Fleet ships were based on the year-to-year Commercial Fleet projections.

The billet structure for each ship was correlated with its union affiliations and, for each union, the ratio of paid vacation days to days sailed under the current labor-management contracts. This ratio or "vacation multiplier" for each billet provides the basis for calculating the number of mariners ashore who are supported by a specific billet. The supply function for this analysis is calculated by aggregating the number of mariners ashore supported by each sailing billet for every year in the fleet projection.

Table A
Reserve Sealift Fleet Projections

	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	'05
RO/RO	27	29	29	31	33	35	36	36	36	36	36	36
Cont.-RO/RO	1	1	1	1	1	1	1	0	0	0	0	0
Barge	7	7	7	7	7	7	7	7	7	7	7	7
Breakbulk	46	33	33	33	33	33	33	14	14	14	14	14
Cont.-BB20	1	1	1	1	1	1	1	0	0	0	0	0
Crane Ship	8	9	9	9	9	9	9	9	9	9	9	9
Tanker	11	8	8	5	5	5	5	5	5	5	5	5
T-AVB	2	2	2	2	2	2	2	2	2	2	2	2
Ready Reserve Force Total	103	90	90	89	91	93	94	73	73	73	73	73
Fast Sealift	8	8	8	8	8	8	8	8	8	8	8	8
LMSR	0	0	0	0	2	5	7	11	11	11	11	11
TOTAL	111	98	98	97	101	106	109	92	92	92	92	92

This table reflects Reserve Sealift Fleet projections validated by U.S. Transportation Command as of June 30, 1995.
Totals do not include Reserve Sealift Fleet ships that are projected to be activated for use in prepositioning programs.

The numbers of mariners required to crew the current and projected Reserve Sealift Fleet were computed for four sets of assumptions based on the current Maritime Administration crewing scales for each Ready Reserve Force ship type/class. While crewing scales for the Large Medium Speed RO/ROs have not yet been established it was assumed that these would be the same as those for Ready Reserve Force RO/ROs with a Reduced Operating Status crew. Ranging from worst (i.e., most demanding) case to best case, the four sets of assumptions for Ready Reserve Force crewing demand are:

- **Case 1, Full Crew** - Current Maritime Administration "mission" billet structure.
- **Case 2, Full Crew with Reduced Operating Status Crews** - Current billet structure, less the appropriate Reduced Operating Status crew on each ship designated as either ROS-4 (10 persons) or ROS-5 (9 persons).

- **Case 3, Reduced Crew** - Current Maritime Administration "mission" billet structure reduced by eliminating some billets not required by the ship's Certificate of Inspection.

- **Case 4, Reduced Crew with Reduced Operating Status Crews** - The Case 3 billet structure, less the Case 2 Reduced Operating Status and maintenance crews.

The crew reductions are in line with current merchant marine practice. These include a watchstanding rather than day-working Chief Mate and First Assistant Engineer. Similarly, ratings that have, in general, been eliminated aboard commercial vessels were eliminated. The reductions in skilled unlicensed engineers recognized the use of engine room automation where it was documented on the Maritime Administration billet structure document for each ship type/class.

This analysis requires a number of assumptions to account for those factors which could have a significant effect on the analysis but cannot be quantified without an unreasonable expenditure of resources. The analysis can be tested for its sensitivity to the validity of these assumptions through what is known as a sensitivity analysis. All three of the major assumptions were subjected to sensitivity analyses. These major assumptions were:

- Mariners' Re-Employment Rights legislation will be enacted or, if not, agreements will be made which ensure that all U.S. flag ship operators will make their personnel on leave available to crew Ready Reserve Force ships without prejudicing their current positions or seniority.

- Agreements will be made among maritime labor unions, under the aegis of the Maritime Administration, to permit members of one union to fill vacant billets aboard ships contracted to another union (i.e., "cross-leveling") in a conflict or crisis.

- The fleet projections, which are based on Maritime Administration projections, publications and personal interviews, are reasonably accurate.

The most and least demanding Case/Scenario combinations are summarized graphically in Figures A and B. Figure A (Case 1 - Scenario I) is the most demanding Case/Scenario combination. Figure B (Case 4 - Scenario II) is the least demanding. The results of the analyses for all 8 Case/Scenario combinations are included in Chapter 3.

Figure A
Mariner Surplus/Shortfall Analysis
Full Crew, Maritime Security Program Not Enacted

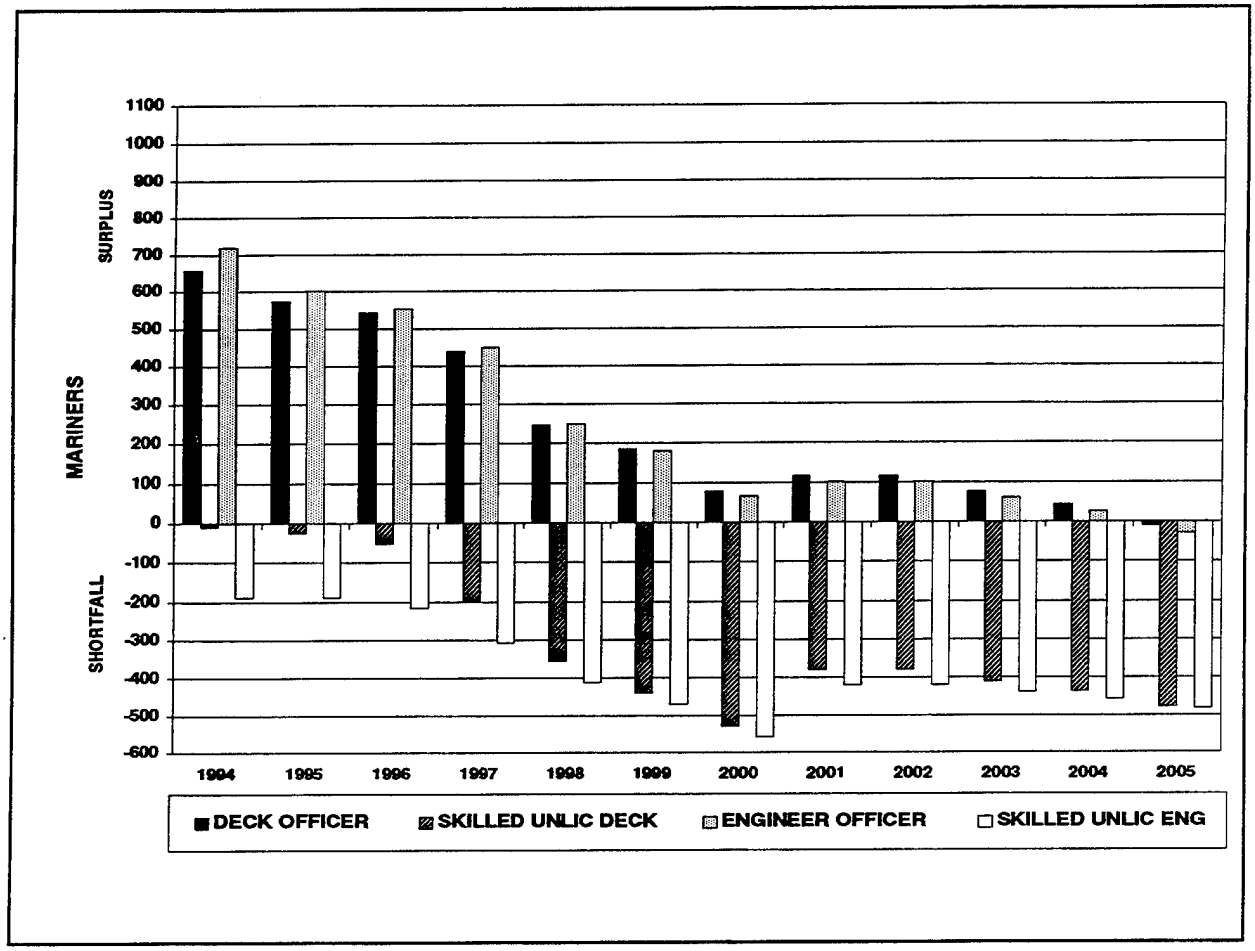
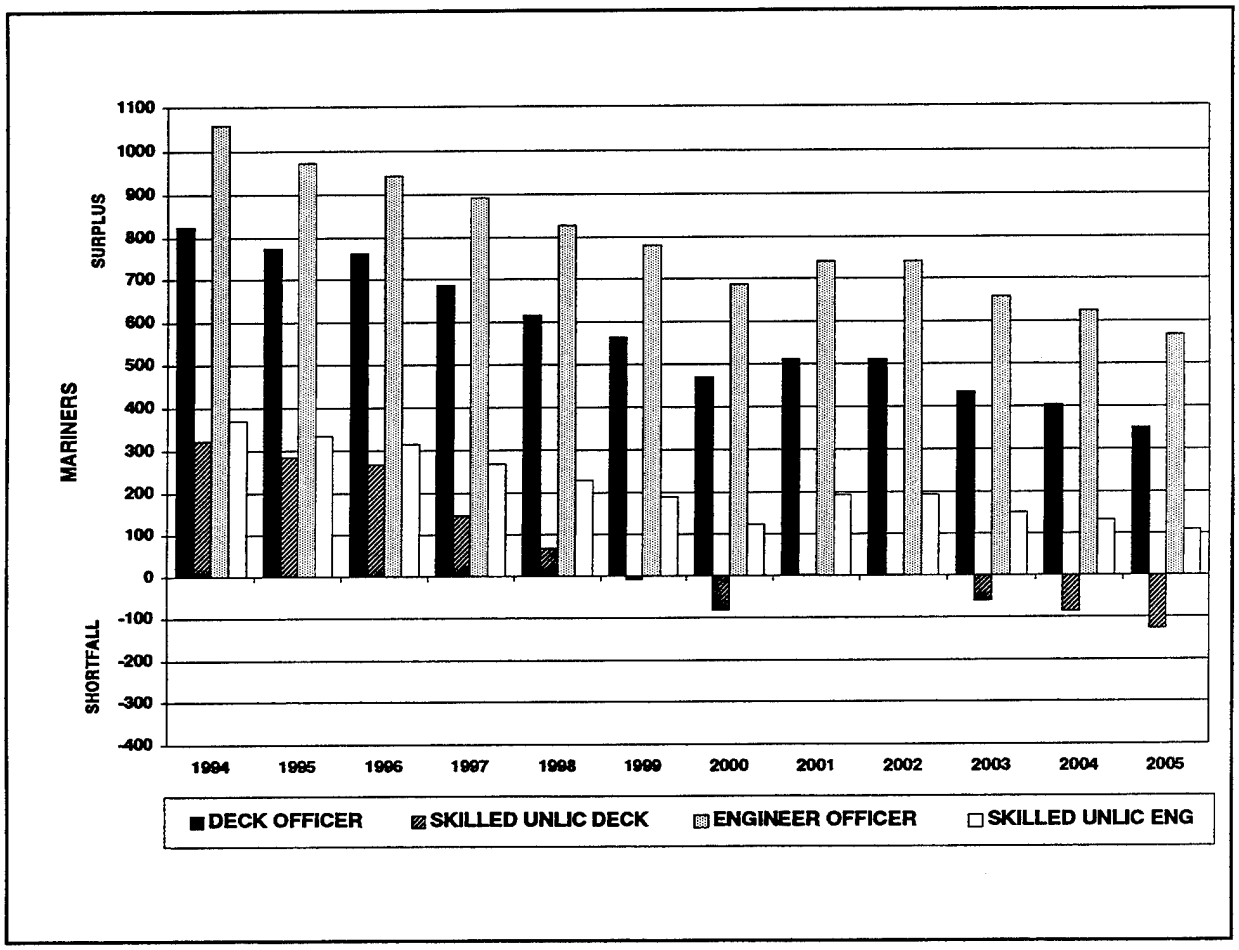


Figure B
Mariner Surplus/Shortfall Analysis - Reduced Crews with Reduced Operating Status Crews, Maritime Security Program Enacted



The analysis shows that commercial crewing shortfalls are neither balanced nor proportional among billet categories (deck officer, engineer officer, skilled unlicensed deck and skilled unlicensed engineer) in either Scenario. Imbalances in the supply of officers versus skilled unlicensed personnel directly mirror trends in crew composition.

Significant reductions in the size of Ready Reserve Force crews and continued extensive use of Reduced Operating Status crews would minimize the projected shortfalls in the supply of skilled mariners to crew the Ready Reserve Force. Although in only one of the Cases analyzed is a shortage of licensed officers projected, shortfalls in the supply of skilled unlicensed mariners are projected in every Case analyzed.

The decision to keep a block of 21 designated dry cargo ships in the Ready Reserve Force until 2001 has a significant negative impact on the ability of the pool

of available mariners to crew the Reserve Sealift Fleet. In every Case/Scenario the most severe, or second most severe, shortfalls of the entire 10 year period occur in the year before these ships are removed from the Ready Reserve Force. All of these ships are older, breakbulk type ships which require relatively large crews. Removing them from the Ready Reserve Force earlier, or phasing them out over time rather than as a block, would alleviate crewing shortfalls early in the period and significantly reduce shortfalls prior to the year 2000.

It would appear highly unlikely, even in the extreme worst case, that whole ships could not be crewed. Rather, the likely situation is that the activation and sailing of numerous ships could be delayed due to the lack, in each case, of perhaps 2 or 3 skilled unlicensed members of the deck and engine departments (4 to 6 persons total). A program to provide complete crews for Ready Reserve Force ships large enough to overcome shortages among skilled unlicensed personnel would create a significant surplus of officers.

Marginal shortfalls (less than 100, or approximately 1 person per ship) could be resolved, in some cases, through Coast Guard permission to sail short-handed and through enhanced commercial crewing efforts. Altering the composition of the Reduced Operating Status crews to include more skilled unlicensed personnel would also have a positive impact. Another option would be to maximize the availability of mariners from the other labor pools. Similarly, non-traditional sources such as the offshore towing and oil industries could provide a number of qualified skilled unlicensed personnel.

Enactment of the Maritime Security Program and its associated re-employment rights legislation reduced the projected shortfalls of skilled unlicensed mariners by 15% to 70%, depending on the Case, and eliminated the licensed officer shortfall in the one Case in which it is projected.

Failure to enact re-employment rights legislation will significantly reduce the projected surpluses of licensed officers. Its impact on the supply of skilled unlicensed mariners, although less significant, will also be negative.

The analysis was relatively insensitive to both the ability to cross-level mariners across labor union jurisdictions and minor variations in the size of the Reserve Sealift Fleet.

Part 2 - FEASIBILITY OF CREWING READY RESERVE FORCE SHIPS WITH U.S. NAVAL RESERVE PERSONNEL

The Naval Reserve contingency crewing concept evaluated in this study envisions a Ready Reserve Force ship crew composed entirely of Naval Reserve personnel. Each Naval Reservist would fill a merchant marine billet in that ship's merchant marine crew structure. The Ready Reserve Force ships assigned to the Naval Reserve would be those perceived to be the most difficult to crew from commercial sources: old, steam propelled, breakbulk general cargo ships. Of these most-difficult-to-crew ships, only those that could not be crewed commercially would be assigned to the Naval Reserve. Under this concept, no uniformed naval personnel would serve in the same crew with civilians.

Some basic differences between merchant marine and naval crewing should be noted before going further. The Ready Reserve Force is comprised primarily of former commercial merchant ships. By longstanding agreement among the Maritime Administration, Department of Defense and the Congress, these ships, when activated, are crewed and operated like commercial merchant ships. One reason for this is that merchant ships are built and operated to move cargo quickly, efficiently and profitably. Even when a merchant ship is assigned the duty of a naval auxiliary it continues to function as a merchant ship. These fundamental differences in purpose and function are reflected in the composition of merchant ship crews and the level of training that each crew member receives.

The ratio of officers to unlicensed (enlisted) personnel aboard a typical merchant ship is 1 to 2. Based on published crew composition of several classes of U.S. Navy warships and auxiliaries, this ratio is approximately 1 to 15 for an average Navy vessel. These ratios reflect a significant difference in philosophy regarding whether officers or enlisted (unlicensed) personnel will have high levels of technical expertise (both theoretical and practical). Merchant ship officers, as the technical experts, spend a significant portion of their working day "doing" rather than "supervising". This creates a shipboard culture contrasting sharply with that of a naval vessel.

Significant shipboard training programs for basic job skill acquisition do not exist in the merchant marine. Every crew billet must be filled by a person who is either licensed or certified as qualified for that billet by the government under whose laws the ship operates. Licensing and certification of mariners aboard U.S. flag ships is the responsibility of the U.S. Coast Guard.

Based on the foregoing, the foundation of the Naval Reserve contingency crewing concept is that the Naval Reserve already has a Merchant Marine Reserve program. It consists of commissioned officers (over 3,000) who possess U.S. Coast Guard licenses. Only those Merchant Marine Reserve officers not actively employed at sea would be considered to support this concept. Naval Reserve enlisted personnel

of appropriate rates and grades would be recruited to fill shipboard billets not requiring Coast Guard licenses.

A thorough, in-depth analysis of the policy, organization, programmatic, and cost issues was conducted and is detailed in Part 2 of this study. The conclusions of this portion of the analysis are that before a Naval Reserve program to crew Ready Reserve Force ships can be implemented, a minimum of five major policy issues must be resolved as follows:

- ❑ Ships to be crewed by Naval Reservists must first be transferred from the Maritime Administration to the U.S. Navy.

- ❑ Numerous Chief of Naval Operations (and subordinate) Instructions must be modified or waived to enable a ship crewed by naval personnel to be operated according to merchant marine standards.

- ❑ Selected Naval Reserve recall procedures should be revised to minimize time required to recall reservists. Ready Reserve Force ship availabilities in Operations Plans and Orders should be revised to reflect this amount of time.

- ❑ Naval Reserve personnel must meet the minimum merchant marine standards of a specific billet prior to assignment to that billet. The current practice of training to meet billet qualifications while serving in that billet would be unsafe in this type program.

- ❑ Merchant Marine Reserve officers must receive legal authorization to command Naval vessels.

All of the foregoing are deemed essential for implementing a Naval Reserve program to crew Ready Reserve Force ships. Once these actions are successfully implemented, the other barriers to program feasibility are the availability of appropriate officer and enlisted personnel, training requirements and program cost.

Analysis of the Selected Naval Reserve population shows that there would be sufficient enlisted personnel with the necessary background and qualifications to meet the program personnel requirements for most enlisted billets. In those cases where sufficient enlisted personnel would not be available, their billets could be combined with others, filled by personnel of the same rating but a higher grade, or eliminated.

Senior officer availability is, on the other hand, inadequate to meet the requirements of any but the smallest Naval Reserve contingency crewing program size evaluated, 10 Ready Reserve Force ships. Even at that program size there would be an insufficient, or barely sufficient, number of qualified Masters and Chief Engineers to operate the ships. The most feasible means of filling these shortfalls

would be to train active duty or retired senior officers or senior enlisted personnel, with the appropriate experience, to fill Command and Department Head level billets. The amount of training required to qualify an individual without prior merchant marine experience and training to fill a senior merchant marine officer billet would be significant. A minimum of 30 days of concentrated training would be required to qualify retired or active duty naval officers to serve in Command or Department Head level billets aboard a ship crewed and operated to merchant marine standards.

The costs for a Naval Reserve contingency crewing concept are based on two notional crewing options: a crew of 11 officers and 28 enlisted personnel (full crew option) and a crew of 9 officers and 20 enlisted personnel (reduced crew option). The specific make-up of these crews and the program personnel requirements are detailed in Chapter 7. Program costs for each crew size option were developed for three program sizes: 10 ships, 20 ships and 30 ships. The annual cost to the Navy (in constant Fiscal Year 1995 dollars) for this contingency crewing program ranges between $9.7 million (10 ships/reduced crew) and $26.1 million (30 ships/full crew). The per-reservist cost ranges between $27,077 (10 ships/reduced crew) and $17,725 (30 ships/full crew).

PART 3 - CONTINGENCY CREWING CONCEPT ANALYSES

Given the results of the requirements analysis in Part 1 it is apparent that some type of contingency crewing program may be required in the future, in some combination of circumstances, to meet the total crewing requirement of the Reserve Sealift Fleet. However, as stated earlier, the Ready Reserve Force component of the Reserve Sealift Fleet will bear a disproportionate share of crewing shortfalls upon activation. Therefore, this section concentrates on meeting the crewing requirements of the Ready Reserve Force.

While there are a number of potential solutions to shortfalls in Ready Reserve Force crewing, all of these solutions involve one of two basic approaches to the problem. The first, which includes the Naval Reserve concept, would provide complete crews of Government employees for some number of Ready Reserve Force ships. The balance of the Ready Reserve Force would then be crewed through commercial means. Contingency crewing concepts using this approach are referred to as **Ship Crew Concepts.**

The second approach to contingency crewing for the Ready Reserve Force would augment the maritime labor pool to fill vacant billets aboard Ready Reserve Force ships on an "as-needed" basis. The mariners augmenting the maritime labor pool would be trained by the government but would be assigned to ships through a modified commercial crewing process. Contingency crewing concepts using this approach are referred to as **Maritime Labor Augmentation Concepts.**

This analysis compares four contingency crewing concepts representative of the two basic approaches (two concepts from each approach).

The four concepts analyzed, by basic type, are:

- **Ship Crew Concepts**
  - Naval Reserve
  - Military Sealift Command Civilian Mariners

- **Maritime Labor Augmentation Concepts**
  - Maritime Administration Civilian Merchant Marine Mobilization Program
  - Military Sealift Command Civilian Mariners

The four concepts were evaluated in both qualitative and quantitative terms. Detailed program cost estimates were developed for each concept as part of the analysis. Each concept was first compared against the other concept of the same type or approach. The concepts were then compared against the two concepts of the other approach. Combinations of concepts from both basic approaches were also considered.

Of the two Ship Crew programs, the Naval Reserve program is consistently more cost effective than the Military Sealift Command program. Therefore, the Military Sealift Command Ship Crew program was eliminated from further analysis.

The Maritime Administration Civilian Merchant Marine Mobilization Program is more cost effective than a similar Military Sealift Command augmentation program except in the least demanding Cases (Scenario I/Case 4, Scenario II/Cases 3 and 4). In these cases the projected mariner shortfalls are so small that they could be filled by existing Military Sealift Command Civilian Mariners if they were not otherwise committed. However, if existing Civilian Mariners are committed to crew Military Sealift Command Reduced Operating Status ships, then the Military Sealift Command augmentation program would not be cost effective in any Case analyzed.

In no Case is the Naval Reserve program more cost effective, on either a total cost basis or cost-per-reservist basis, than the Maritime Administration Civilian Merchant Marine Mobilization Program.

Qualitative analysis shows that the Naval Reserve program is the weakest of the three programs analyzed. If re-employment rights are enacted, the Maritime Administration program is the strongest program of the three. Without re-employment rights enactment, the Maritime Administration program ranks only slightly below the Military Sealift Command Maritime Labor Augmentation program. However, the Military Sealift Command Maritime Labor Augmentation program is significantly less cost effective than the Maritime Administration program.

Part 4 - CONCLUSIONS

From the analyses conducted for this study the final conclusions are that:

- ❑ Where projected shortfalls exist they may be eliminated, or at least minimized, through the year 2005 by reducing Ready Reserve Force crew sizes and establishing Reduced Operating Status crews aboard those ships in the highest readiness status.

- ❑ Retaining a block of 21 dry cargo ships, mostly breakbulks, in the Ready Reserve Force until the year 2001 creates, in the year 2000, the largest or second-largest maritime labor shortfalls for every Case/Scenario combination.

- ❑ Crewing Ready Reserve Force ships with Selected Naval Reserve personnel would require changing multiple Department of Defense and Department of Transportation policies.

- ❑ A Naval Reserve program to crew Ready Reserve Force ships could successfully crew up to 10 ships. A larger program would require more senior officers qualified to fill Command and Department Head billets aboard ship than would be available within the Naval Reserve.

- ❑ Projected shortfalls in crewing the Ready Reserve Force are neither proportional nor balanced in comparison to the pool of available mariners. These shortfalls are, therefore, not susceptible to being efficiently reduced or eliminated by a Ship Crew program such as the Naval Reserve program.

- ❑ The Naval Reserve program is the least effective and most expensive of the programs analyzed.

- ❑ In every Case/Scenario combination analyzed, the least expensive way to ensure crew availability for Ready Reserve Force ships is the Maritime Administration's Civilian Merchant Marine Mobilization Program. However, in the least demanding Cases (Scenario I/Case 4, Scenario II/Cases 3 and 4), the projected mariner shortfalls are so small that they could be filled by existing Military Sealift Command Civilian Mariners if they were not otherwise committed.

- ❑ If Mariner's Re-Employment Rights are enacted, the Maritime Administration program is, qualitatively, the strongest program. Without Mariner's Re-Employment Rights enactment, the qualitative difference between the Maritime Administration program and the Military Sealift Command Maritime Labor Augmentation program is insignificant.

- Some fully trained Military Sealift Command Civilian Mariners could be available, at no additional cost to the Government, to assist with crewing Ready Reserve Force ships. However, it is the position of the Military Sealift Command that this could occur only if the Military Sealift Command did not have to activate Combat Logistics Force ships or other Naval Auxiliaries in Reduced Operating Status.

- The best possible course of action, for the period 1995 through 2005, to minimize maritime labor shortfalls and maximize readiness, would be, in order of priority, to:

  - Reduce Ready Reserve Force crew sizes.
  - Continue to fully fund Reduced Operating Status crews aboard Ready Reserve Force ships which have the highest readiness requirement.
  - Enact Mariner's Re-Employment Rights legislation.
  - Establish inter-union agreements to cross-level mariners during a crisis.
  - Negotiate agreements which ensure that all U.S. flag ship operators will make their personnel on leave available to crew Ready Reserve Force ships without prejudicing their current positions or seniority.
  - Follow through on planned actions to enhance the supply of mariners during a crisis or conflict.
  - Establish a small, cost effective, contingency crewing program or other cost effective means to ensure Ready Reserve Force availability.

- By the year 2005, based on current fleet projections, either the size of the Reserve Sealift Fleet must be reduced, or a cost effective contingency crewing program or other cost effective means to ensure Ready Reserve Force availability must be fully implemented, or some combination of these put into effect.

PART 1

READY RESERVE FORCE

CREWING REQUIREMENTS AND

MARITIME LABOR

AVAILABILITY

Chapter 1
Overview

The Ready Reserve Force is the largest source, both in number of ships and cargo carrying capacity, of quick response shipping to deploy military forces overseas. Ready Reserve Force ships are titled to (owned by) the Department of Transportation. They are maintained and operated, under Maritime Administration contract, by commercial ship operators. While in reserve, the ships are kept in specified states of readiness to proceed to loading berths. Ships are located on the U.S. East, Gulf and West coasts and in Japan. When activated, they are placed under the operational control of the Military Sealift Command, the Naval Component of the U.S. Transportation Command.

For a number of years a major concern of Department of Defense strategic mobility planners has been the assured availability, on short notice, of qualified crews to operate Ready Reserve Force ships. A major element of this concern is that the size of the active U.S. flag merchant marine, which provides the pool of qualified mariners to crew the Ready Reserve Force, is steadily decreasing and is already smaller than it was during the Persian Gulf War. The fleet is forecast to decrease to about half its 1993 size by 2005 (from approximately 350 to approximately 200 ships). During the same period the number of Government owned, commercially crewed ships in reserve status is envisioned to decrease only slightly. The process through which the size of the commercial fleet was projected is explained in Chapter 2.

These trends have a significant impact on the number of mariners available to crew Ready Reserve Force ships. An additional aspect of this potential problem is that the older, steam powered, ships of the Ready Reserve Force require, in general, larger crews with some different job skills than are typical of the ships in the active U.S. flag fleet. In recognition of these impacts, a number of studies have been conducted to determine what, if any, shortfall exists in the supply of trained mariners to crew the Ready Reserve Force.

Ready Reserve Force ships are not the only Government owned cargo ships which rely on the pool of available mariners for crews in a conflict or crisis. The Fast Sealift Ships and the Large Medium Speed RO/ROs being acquired and placed in Reduced Operating Status rely on the same pool of available mariners to fill out their crews. Therefore, while they are not a part of the Ready Reserve Force, they are, for the purposes of this analysis, indistinguishable from Ready Reserve Force ships in terms of crewing. For brevity, the total inventory of Government owned reserve cargo ships (Ready Reserve Force, Fast Sealift Ships and Large Medium Speed RO/ROs in Reduced Operating Status) will be referred to as the Reserve Sealift Fleet. However, because the Fast Sealift Ships and Large Medium Speed RO/ROs will likely have higher crewing priorities, the effects of any shortfalls in mariner availability will fall almost entirely on the Ready Reserve Force.

The Ready Reserve Force activations for Operation Desert Shield in 1990 were the first large scale tests of the ability to simultaneously crew large numbers of Ready Reserve Force ships. Apparent shortages of certain skilled personnel hindered crewing of some ships within the required times. Based on the Operation Desert Shield experience, several assessments of these activations have been conducted.

One of these assessments (Appendix A) states that "The chief findings of the study are that a quantitative and qualitative manning problem exists and is becoming worse." This assessment also asserts that the number of mariners available to crew the Ready Reserve Force for Operation Desert Shield was significantly short of the number that would have been expected to be available. Further, it postulates that by the year 2000 only 22 Ready Reserve Ships could be crewed by normal commercial means with another 18 crewed by "enhanced" commercial means.

This study is organized in four parts. The first (Part 1) analyzes the requirement for a Ready Reserve Force contingency crewing program. Next, in Part 2, the feasibility of using Naval Reserve personnel to crew a portion of the Ready Reserve Force is analyzed. In Part 3, the Naval Reserve contingency crewing program developed in Part 2 and three other potential contingency crewing programs are subjected to both quantitative and qualitative analysis. These analyses seek to answer the following questions:

- ❑ What kind of contingency crewing program, if any, should be used for the Ready Reserve Force?
- ❑ How large must a Ready Reserve Force contingency crewing program be?
- ❑ What is the most effective means of ensuring that Ready Reserve Force ships are crewed when they are needed?

Finally, the conclusions resulting from the analyses in the first three sections are presented in Part 4.

Chapter 2
Methodology and Assumptions

This portion of the study seeks to answer two fundamental questions. First, is sufficient maritime labor available to crew the Reserve Sealift Fleet, including the Ready Reserve Force? Second, if there is a shortfall of maritime labor to crew these ships, how great is the shortfall and in what areas? These questions will be resolved by analyzing the number of commercial mariners available to crew the Reserve Sealift Fleet relative to the crewing needs of the current and projected Reserve Sealift Fleet. The crewing demand was assessed for four different cases within each of two scenarios. Sensitivity analyses were conducted for each of the major assumptions.

A. Commercial Maritime Labor Sources

Within the commercial sector are what may be considered five general labor sources or pools. The membership of each pool is fluid, varying with a number of conditions. These labor pools may be defined as follows:

- **Supportable** - This pool of mariners can be considered to be fully employed, based on the number of shipboard billets available and the applicable vacation rotation for those billets.

- **Active/Under-Employed** - These mariners are still actively seeking, and dependent upon, seagoing employment but are in excess to the number that is supportable by the active merchant fleet. They are in the process of deciding whether to find other full time employment or accept long-term partial employment.

- **Occasional** - These individuals are no longer completely dependent upon seagoing employment. However, they may take advantage of temporary maritime employment opportunities to augment their income while transitioning to full time employment ashore.

- **Qualified/Non-Active** - This pool is made up of those who have full time employment ashore and are no longer dependent in any way upon seagoing employment. However, they have not let their licenses or certifications lapse and are, therefore, still qualified.

- **Semi-Qualified** - These are individuals much like the "Qualified" labor pool but who have let their licenses or certifications lapse. While basic skills and knowledge are retained, re-licensing/certification and some remedial training would be required before they could return to sea.

The only labor pool whose size can be determined, and forecast, with any measure of confidence and accuracy is the "Supportable" labor pool because it is tied directly to shipboard billets and vacation schedules. The others, because of their fluid membership and the wide range of factors that influence mariners to move from one pool to another, cannot be measured, or forecast, with any assurance of accuracy. Further, even if the number of mariners now in each of these other pools could be precisely quantified, the numbers are constantly changing and extrapolation would have questionable validity.

In previous analyses of Ready Reserve Force crewing the method used to determine the size of the commercial maritime labor force was to multiply the number of billets by a "traditional" multiplier of some amount. These "traditional" multipliers have tended to overstate mariner supply because they lump all mariners into one labor pool and do not recognize the variable availability of mariners as they move, for whatever reason, from one level of employment activity (labor pool) to another. There certainly will be a number of mariners in the "Supportable" pool who would not crew Ready Reserve Force ships. On the other hand, a similarly indeterminate number of mariners from the other labor pools would volunteer to crew Ready Reserve Force ships.

Because of these uncertainties, the conservative approach of considering only the "Supportable" pool is the one used in the following analyses. Although this approach may understate the supply of mariners to crew the Ready Reserve Force, it will most readily identify areas of risk in crewing the Ready Reserve Force to those responsible for making decisions about Ready Reserve Force contingency crewing programs.

B. Active Fleet Projections

Because the size of the "supportable" or fully employed maritime labor pool varies directly with the number of seagoing billets available and their vacation rotation, the first step in the analysis was to develop the projected size of the active U.S.-flag merchant marine for each year from 1994 to 2005. Fleet projections were made for two scenarios. The first or base scenario assumes that no new subsidy program, such as the Maritime Security Program, is enacted to replace the current Operating Differential Subsidy program. The second scenario assumes that a replacement subsidy program is enacted. Both scenarios incorporate the Maritime Administrator's "Forecast of U.S. Flag Privately Owned Dry Cargo [Liner] Fleet"; projections of the dry bulk and tanker fleets are based on the Maritime Administration's "Life Rules" for merchant ships.

The Life Rules were modified to reflect the tanker phase-outs mandated by federal and international oil pollution reduction regulations. The fleet projections assume that the Jones Act will remain in force but that the number of tankers required for the Alaskan oil trade will decline as the supply of Alaskan oil dwindles. Some ships

in identifiable Jones Act trades with a continuing transportation requirement were assumed to be either replaced or continued in service after the Life Rules would indicate their removal from the active fleet.

The active fleet also includes those Ready Reserve Force ships that are scheduled for long term activations to support Afloat Pre-Positioning programs, such as the Army Heavy Brigade Afloat program. As the Large Medium Speed RO/ROs become available for Afloat Pre-Positioning, the ships activated from the Ready Reserve Force are returned to their previous reserve status. Ships under charter to the Military Sealift Command were extended in service as they would be replaced by another U.S. flag ship.

(1) Scenario I - No Maritime Security Program

Scenario I, taking a conservative approach, assumes that no new subsidy program, such as the proposed Maritime Security Program, is enacted. The consequence of this assumption is that many U.S. flag vessels operating in U.S. foreign trade would be scrapped or re-flagged when their current subsidy contracts expire. For each ship now under Operating Differential Subsidy, the phase-out date was taken as the earlier of the operator's subsidy contract expiration or the end of the ship's subsidizable life. The U.S. flag fleet projection for this scenario is located in Appendix B.

(2) Scenario II - Maritime Security Program

Scenario II provides the basis for a sensitivity analysis of mariner supply to the proposed Maritime Security Program. It assumes that those liner vessels now operating in U.S. foreign trade and built during or after 1980 (plus two sister ships built in 1979) remain in U.S.-flag subsidized service through the year 2005. This scenario projected a net gain (retention) of 47 U.S. flag commercial ships through the year 2005 based on this assumption. Although more than 50 ships were identified as potentially subsidizable, it is believed that some would remain under U.S. flag without subsidy to remain eligible for carrying government preference cargoes. The fleet projection for this scenario is located in Appendix C.

C. Reserve Sealift Fleet Projection

Ready Reserve Force size projections assumed the acquisition of an additional 5 RO/ROs from commercial sources and the phasing out of 40 ships (34 dry cargo and 6 tankers). The projections also account for Reserve Sealift Fleet ships in active service supporting pre-positioning programs. When these ships are in active service they are part of the Active Fleet; they are returned to the Reserve Sealift Fleet upon their scheduled deactivation. These projections, based on Reserve Sealift Fleet plans as of June 30, 1995, are summarized in Table 1 and shown in detail in Appendix D.

Table 1
Reserve Sealift Fleet Projections

	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	'05
RO/RO	27	29	29	31	33	35	36	36	36	36	36	36
Cont.-RO/RO	1	1	1	1	1	1	1	0	0	0	0	0
Barge	7	7	7	7	7	7	7	7	7	7	7	7
Breakbulk	46	33	33	33	33	33	33	14	14	14	14	14
Cont.-BB20	1	1	1	1	1	1	1	0	0	0	0	0
Crane Ship	8	9	9	9	9	9	9	9	9	9	9	9
Tanker	11	8	8	5	5	5	5	5	5	5	5	5
T-AVB	2	2	2	2	2	2	2	2	2	2	2	2
Ready Reserve Force Total	103	90	90	89	91	93	94	73	73	73	73	73
Fast Sealift	8	8	8	8	8	8	8	8	8	8	8	8
LMSR	0	0	0	0	2	5	7	11	11	11	11	11
TOTAL	111	98	98	97	101	106	109	92	92	92	92	92

This table reflects Reserve Sealift Fleet projections validated by U.S. Transportation Command as of June 30, 1995.
Totals do not include Reserve Sealift Fleet ships that are projected to be activated for use in prepositioning programs.

D. Commercial Seafarer Supply

The estimated numbers of mariners who would likely be available to crew Reserve Sealift Fleet ships were based on the year-to-year Commercial Fleet projections. The billet structure for each ship was correlated with its union affiliations and, for each union, the ratio of paid vacation days to days sailed under the current labor-management contracts. This ratio or "vacation multiplier" for each billet provides the basis for calculating the number of mariners ashore who are supported by a specific billet. Billets aboard Reserve Sealift Fleet ships in Reduced Operating Status have, effectively, no vacation multiplier since the personnel filling these billets only receive two weeks of vacation per year. However, these billets do have the positive effect of reducing crewing demand. The supply function for this analysis is calculated by aggregating the number of mariners ashore supported by each sailing billet for every year in the fleet projection.

For example, if a billet aboard a ship accrues 15 vacation days for every 30 day period aboard ship, the vacation multiplier for that billet is 0.5. This billet provides full employment to, or supports, 1.5 mariners (i.e., one is always aboard the ship and the "one-half" mariner is on leave). Put another way, for every two sailing billets with this vacation accrual, there would be one mariner on leave (supported by those billets) who would be available to fill an appropriate billet aboard a Reserve Sealift Fleet ship.

E. Reserve Sealift Fleet Crewing Demand

The number of mariners required to crew the current and projected Reserve Sealift Fleet were computed for four sets of assumptions based on the current Maritime Administration crewing scales for each Ready Reserve Force ship type/class. While crewing scales for the Large Medium Speed RO/ROs have not yet been established it was assumed that these would be the same as those for Ready Reserve Force RO/ROs with a Reduced Operating Status crew. The four cases, ranging from worst (i.e., most demanding) to best, for Reserve Sealift Fleet crewing demand are:

- **Case 1, Full Crew** - Current Maritime Administration "mission" billet structure.
- **Case 2, Full Crew with Reduced Operating Status Crews** - Current billet structure, less the appropriate Reduced Operating Status crew on each ship designated as either ROS-4 (10 persons) or ROS-5 (9 persons).
- **Case 3, Reduced Crew** - Current Maritime Administration "mission" billet structure reduced by eliminating some billets not required by the ship's Certificate of Inspection.
- **Case 4, Reduced Crew with Reduced Operating Status Crews** - The Case 3 billet structure, less the Case 2 Reduced Operating Status and maintenance crews.

The crew reductions are in line with current merchant marine practice. These include a watchstanding rather than day-working Chief Mate and First Assistant Engineer. Similarly, ratings that have, in general, been eliminated aboard commercial vessels were eliminated. These included Assistant Electrician, Carpenter and Refrigeration Engineer. In addition, the day-working Boatswain was replaced with a watch-standing Boatswain, which eliminated the need for one Able Bodied Seaman. Crewing requirements for the Fast Sealift Ships and Large Medium Speed RO/ROs [LMSR] reflect their actual or projected Reduced Operating Status crews in the Cases (1 and 3) which do not include Reduced Operating Status crews for Ready Reserve Force ships. For Cases 3 and 4 (Reduced Crew), the sea trial crew was used for the Fast Sealift Ship and the reduced crew for a Ready Reserve Force RO/RO was assumed for the Large Medium Speed RO/RO.

The reductions in skilled unlicensed engineers recognized the use of engine room automation where it was documented on the Maritime Administration billet structure document for each ship type/class. These documents are in Appendix E. Table 2 provides a side-by-side comparison of Maritime Administration "mission" crewing scales (Cases 1 and 2) versus the "reduced" crewing scales (Cases 3 and 4) for two Ready Reserve Force ship types.

Table 2
Typical Maritime Administration Mission Crew Scales versus Reduced Crew Scales

	Ro/Ro		Breakbulk	
Labor Category	Mission	Reduced	Mission	Reduced
Deck Officers	5	4	5	4
Skilled Unlicensed Deck	10	6	10	6
Radio Officer	1	1	1	1
Engineering Officers	5	4	5	4
Skilled Unlicensed Engineers	7	4	10	4
Steward's Department	5	4	5	4
Total	33	23	36	23

The Maritime Administration crewing documents generally do not consider the extensive automation found in the modern (15 years old or less) diesel propulsion plants found on most Ready Reserve Force (and Large Medium Speed) RO/ROs. The number of engineers required to operate automated diesel propulsion plants is significantly lower than that used in the Case 3 crews (i.e., 3 rather than 4 engineer officers and 1 or 2, rather than 4, unlicensed engineers). Some ships with extensive automation, such as the Large Medium Speed RO/ROs, can be operated with as few as 16 persons in the crew. Therefore, additional crew reductions could be possible on some Ready Reserve Force ships.

The effects on both the supply and demand functions of having activated Ready Reserve Force RO/ROs for the Interim Army Heavy Brigade Afloat Program and their planned replacement (and subsequent deactivation) by Large Medium-Speed RO/ROs for this mission were also reflected. Similarly, Ready Reserve Force ships activated for the Afloat Pre-Positioning program were removed from the demand function and reflected in the supply function.

F. Major Assumptions

This analysis requires a number of assumptions to account for those factors which could have a significant effect on the analysis but cannot be readily quantified without an unreasonable expenditure of resources. The analysis can be tested for its sensitivity to the validity of these assumptions through what is known as a sensitivity analysis. The more sensitive the results of an analysis are to an assumption, the higher the risk posed by making decisions based on that assumption. All three of the major assumptions described below were subjected to sensitivity analyses, described later in this chapter.

(1) Mariner Re-Employment Rights

This analysis assumes that in a crisis or conflict there would be no impediments which would restrict qualified mariners from seeking and accepting employment aboard Ready Reserve Force ships. One of these potential impediments is the lack of re-employment rights for mariners. If serving aboard a Ready Reserve Force ship is equivalent to resigning from a job, even a seagoing job, the available supply of qualified mariners may be significantly reduced. This situation has been recognized and legislation is pending to extend the same protections enjoyed by military reservists to commercial mariners and others who accept employment aboard Ready Reserve Force ships in a conflict or crisis. However, if re-employment rights legislation is not enacted, the lack of these protections could have a chilling effect on the availability of senior mariners. In that event, agreements could be made with U.S. flag ship operators, under the aegis of the Maritime Administration, to ensure that they will make their personnel on leave available to crew Ready Reserve Force ships without prejudicing their current positions or seniority. However, enactment of re-employment rights legislation is assumed in calculating the supply of commercial mariners.

(2) Efficient Use of Available Mariners

More than 90% of seagoing billets aboard U.S. flag ships are subject to some sort of collective bargaining agreement. A unique aspect of U.S. maritime unions is the number of different unions representing crew members. Ship operators negotiate with up to six unions aboard the same ship. Union members work only aboard those ships operated by companies which have a contract with their union. Working aboard a ship contracted with another union is generally not possible and would be grounds for some type of disciplinary action by one or both unions involved. This makes it particularly difficult to efficiently utilize maritime labor during a crisis.

The merchant marine personnel assignment system must efficiently use all available mariners during a conflict or crisis. This is complicated by the fragmentation of the Supportable labor pool among the various labor unions. Having recognized this fact, the Maritime Administration is presently working to ensure that efficient use of available mariners, regardless of union affiliation, can be made during a conflict or crisis. Successful implementation of the actions required by all parties to ensure this outcome has been assumed in calculating the supply of commercial mariners.

A related issue is the willingness of maritime labor unions to permit retirees to sail during a conflict or crisis without permanent loss of their union retirement benefits. Successful resolution of this issue would augment the number of mariners who would potentially be available to crew Reserve Sealift Fleet ships.

(3) Accuracy of Fleet Projections

The study results are entirely dependant on the accuracy of the mariner supply and demand functions. These functions, in turn, are dependant for their accuracy upon the validity of the fleet projections. The projections used in this analysis are based on Maritime Administration projections, publications and personal interviews and are assumed to be reasonably accurate.

Chapter 3
Mariner Supply/Demand Analysis

The quantitative results of this analysis are summarized in Table 3 and discussed in detail below. The "balances" shown in this table are the result of subtracting the demand function from the supply function, for each labor category, for the year 2005. A negative value (-) indicates that a shortfall between the supply of available mariners and the demand for mariners to crew the Reserve Sealift Fleet exists in 2005. The first year in which a shortfall of any amount occurs for that labor category is noted in the adjacent column. This information is shown for both Scenarios (with and without enactment of the proposed Maritime Security Program) and for the four Cases defined in Chapter 2. The bar graphs in Figures 1 through 8 display the same information for each year from 1994 to 2005. Mariner supply/demand details for the year 2001 and line graphs of the supply/demand functions for each Case by labor category are located in Appendices F (Scenario I) and G (Scenario II). Line graphs for the sensitivity analyses are located in Appendix H.

Table 3
Commercial Mariner Shortfall/Surplus Analysis Summary

Scenario	Case	Deck Officer Balance (2005)	First Short-fall Year	Engineer Officer Balance (2005)	First Short-fall Year	Unlicensed Deck Balance (2005)	First Short-fall Year	Unlicensed Engineer Balance (2005)	First Short-fall Year
I-No MSP	1-Full Crew	-10	2005	-30	2005	-480	1994	-480	1994
I-No MSP	2-Full Crew with ROS	70		280		-450	1996	-260	1994
I-No MSP	3-Reduced Crew	90		80		-270	1998	-180	1998
I-No MSP	4-Reduced Crew w/ ROS	170		390		-240	1998	40	
II-MSP	1-Full Crew	170		150		-360	1994	-410	1994
II-MSP	2-Full Crew with ROS	260		460		-340	1997	-200	1994
II-MSP	3-Reduced Crew	270		260		-150	1999	-110	1999
II-MSP	4-Reduced Crew w/ ROS	350		570		-130	1999	110	

NOTE: No MSP = Maritime Security Program not enacted.
MSP = Maritime Security Program enacted.
ROS = Reduced Operating Status crews aboard designated Ready Reserve Force ships.
All figures rounded to the nearest 10.

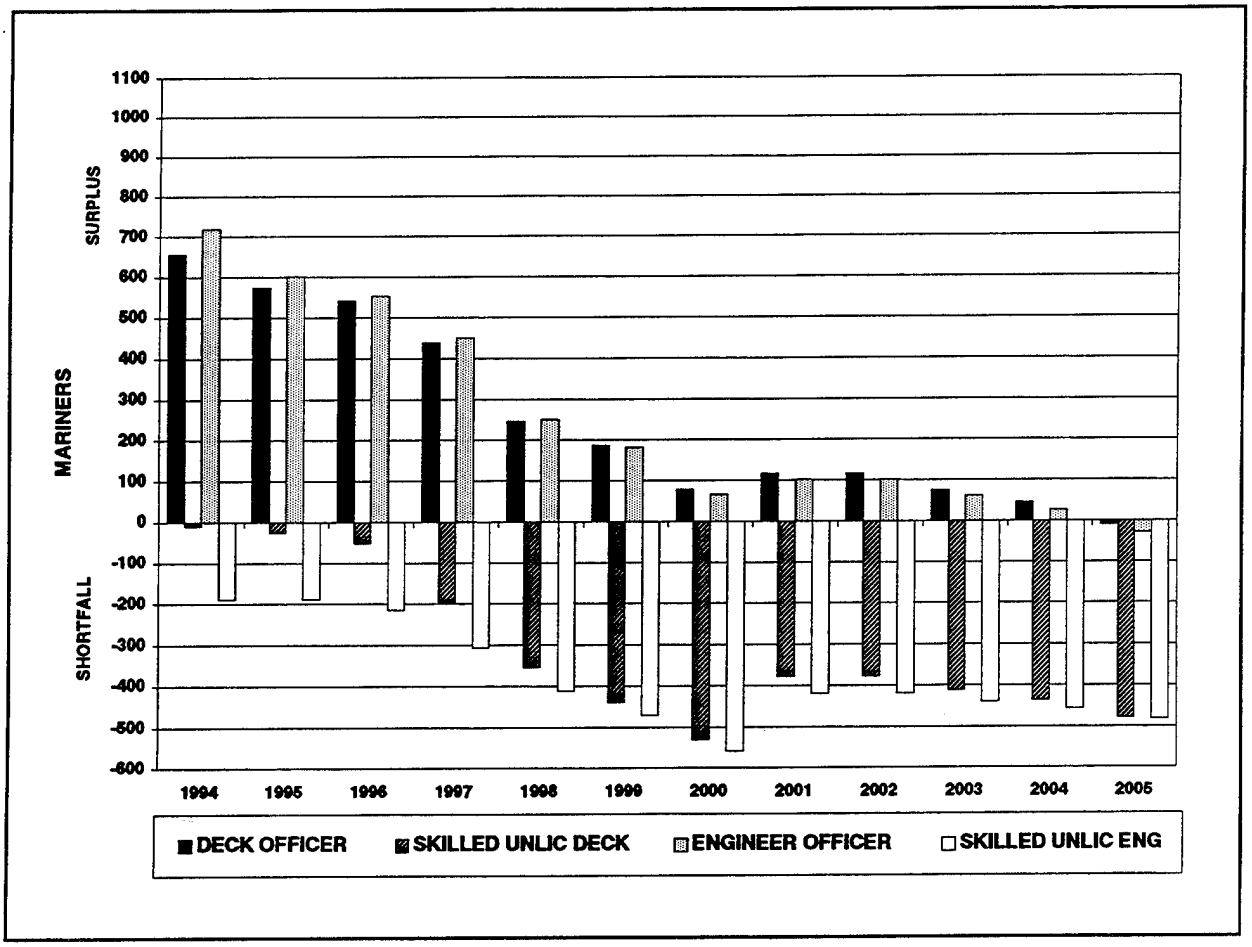
A. Scenario I, No Maritime Security Program

This Scenario, as discussed above, assumes that the proposed Maritime Security Program will not be enacted. Failure to enact this legislation would result in a projected net loss to the active fleet of 47 ships.

(1) Case 1, Full Crew

This Case is the most demanding of the 8 Case/Scenario combinations analyzed. Nevertheless, only moderate shortages of deck and engineering officers are projected for the year 2005. There would be significant shortages of skilled unlicensed personnel in both the deck and engine departments. These shortfalls could have occurred as early as 1994 and are most severe in 2000. That is the year before the scheduled removal from the Ready Reserve Force of 21 dry cargo ships, as shown in Table 1. The relative shortfalls and surpluses for each labor category in terms of supply versus the demand function are shown in Figure 1.

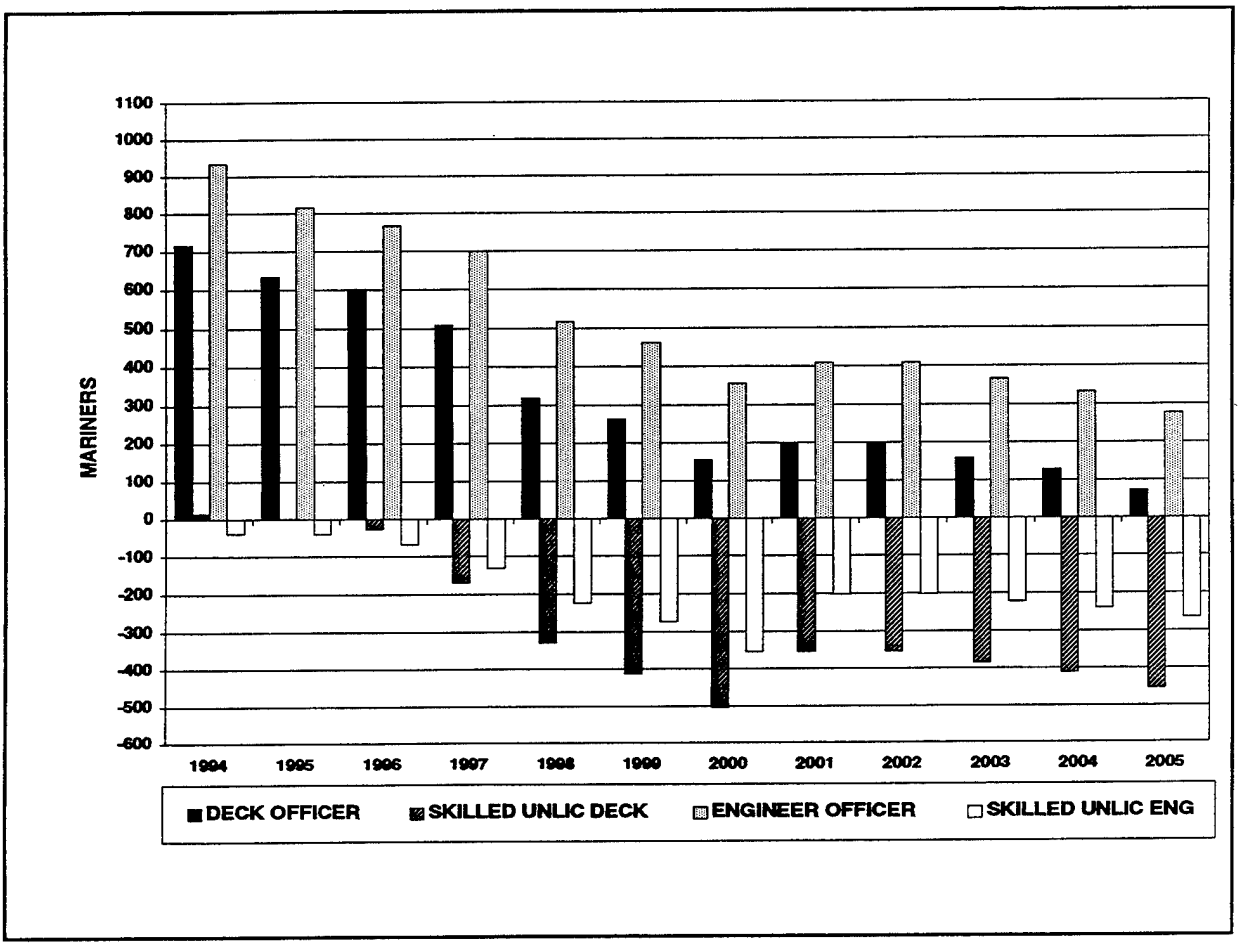
Figure 1
Mariner Shortfall Analysis - Case 1, Scenario I



(2) Case 2, Full Crew with Reduced Operating Status Crews

In this Case, which reflects the current status, both deck and engineering officers are projected, for the year 2005, to be in surplus. Shortages of skilled unlicensed personnel could occur as early as 1994 and are most severe in 2000. However, in some situations ships may be able to sail short-handed since crew levels in this Case still exceed U.S. Coast Guard minimum requirements. The relative shortfalls and surpluses for each labor category in terms of supply versus the demand function are shown in Figure 2.

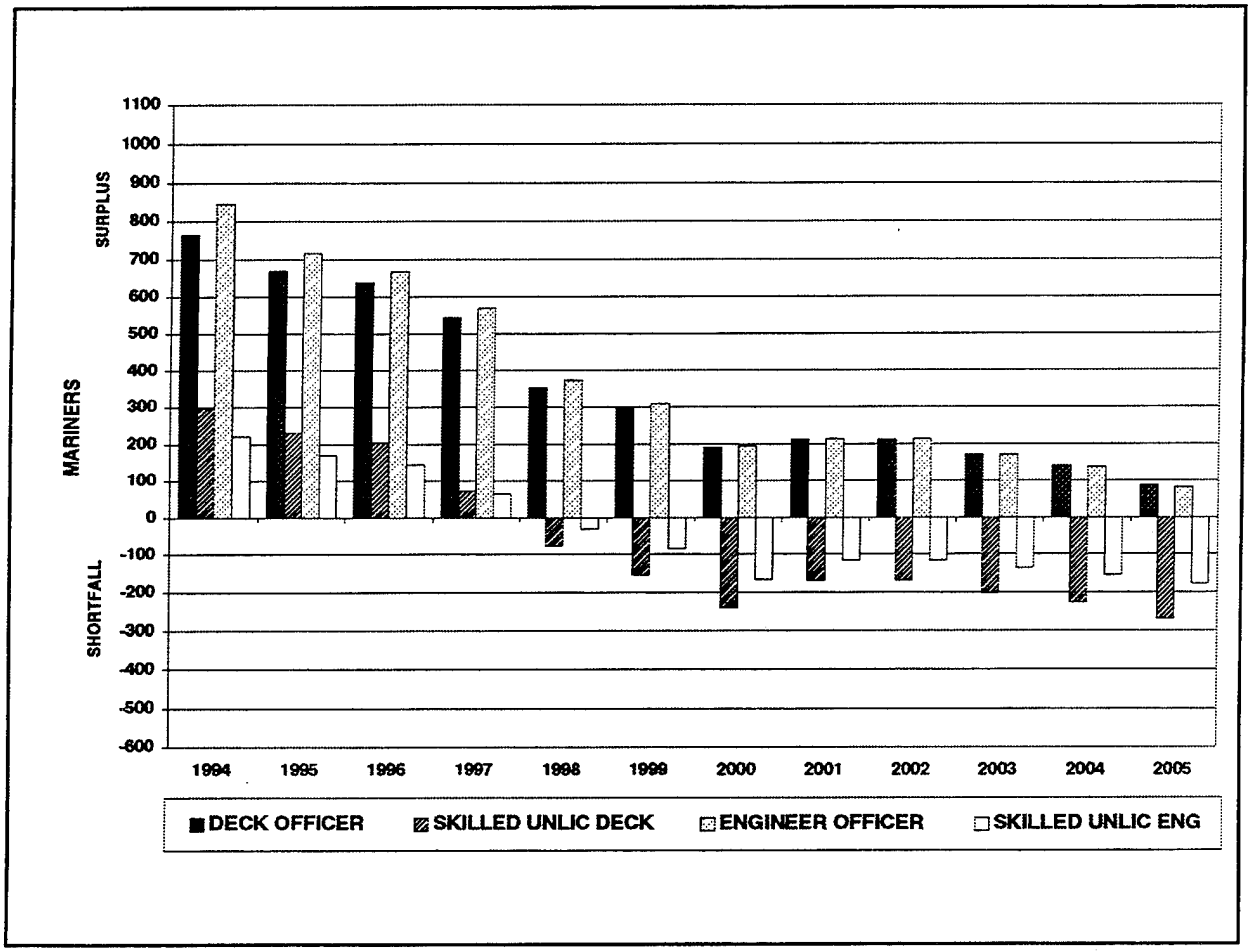
Figure 2
Mariner Shortfall Analysis - Case 2, Scenario I



(3) Case 3, Reduced Crew

In this Case, both deck and engineering officers are projected, for the year 2005, to be in surplus. Skilled unlicensed personnel would have significant, although smaller, projected shortfalls than in either Case 1 or 2. These shortfalls could occur as early as 1998. However, unlike Case 2, ships would not be able to sail short-handed since their crews would already be at or near U.S. Coast Guard minimum requirements. The relative shortfalls and surpluses for each labor category in terms of supply versus the demand function are shown in Figure 3.

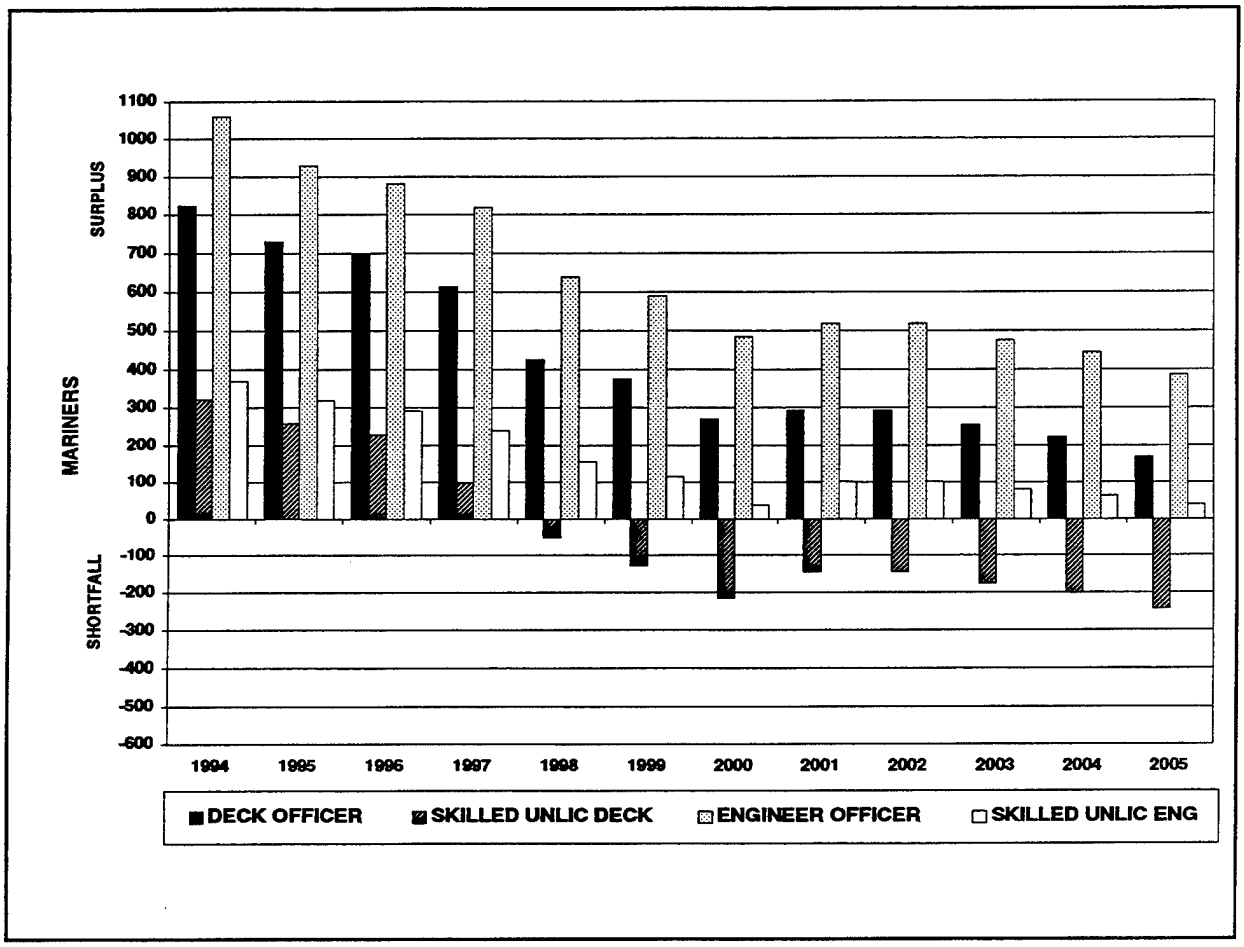
Figure 3
Mariner Shortfall Analysis - Case 3, Scenario I



(4) Case 4, Reduced Crew with Reduced Operating Status Crews

Significant deck and engineering officer surpluses are projected for the year 2005 in this Case. Also, for the first time, there would be no shortage of skilled unlicensed engine department personnel. There would still be a projected shortfall of skilled unlicensed deck department personnel starting in the year 1998. The relative shortfalls and surpluses for each labor category in terms of supply versus the demand function are shown in Figure 4.

Figure 4
Mariner Shortfall Analysis - Case 4, Scenario I



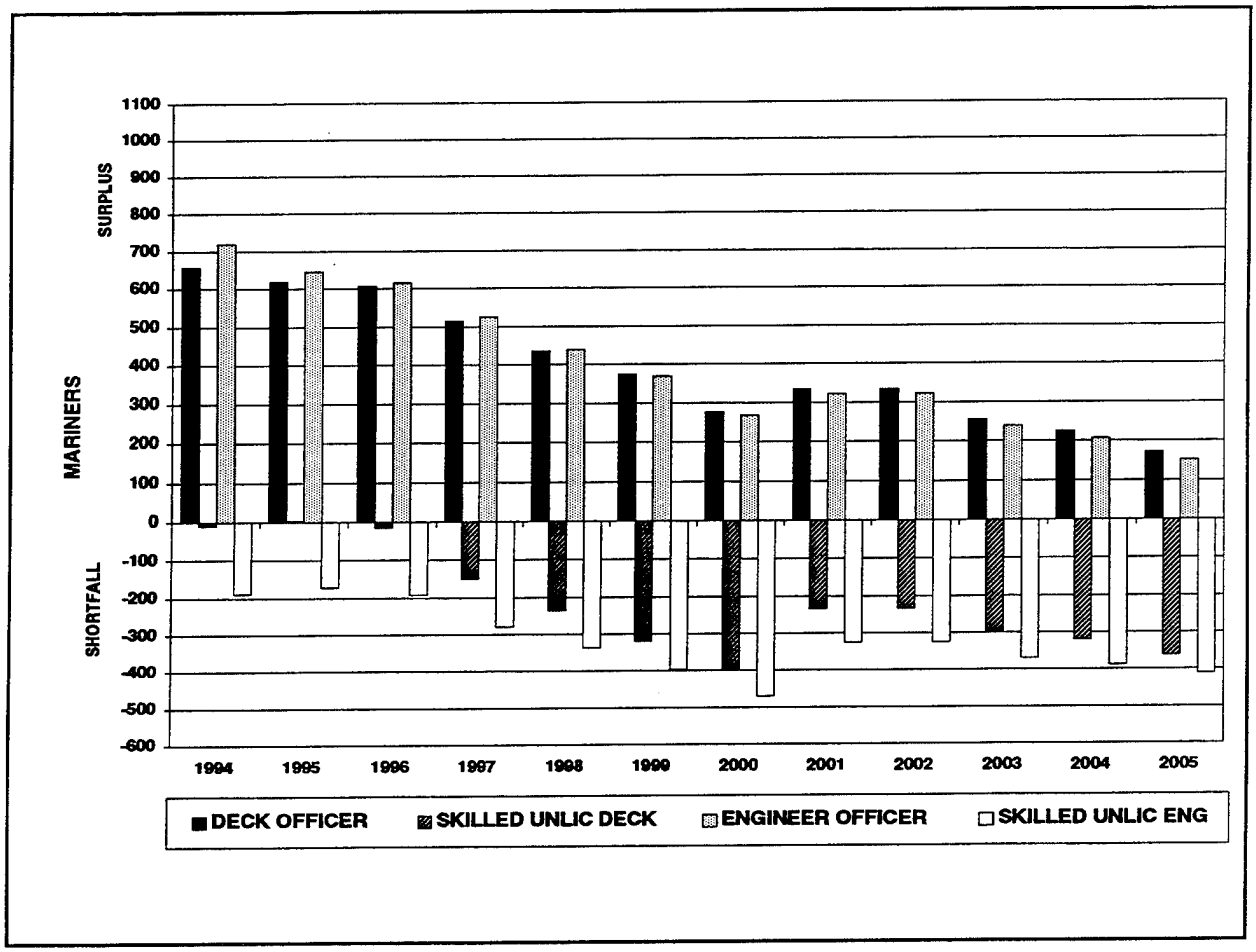
B. Scenario II, Maritime Security Program Enacted

This Scenario, as discussed above, assumes that the proposed Maritime Security Program will be enacted. This would result in a projected net gain (retention) of 47 ships to the active fleet.

(1) Case 1, Full Crew

Through the year 2005, a surplus of both deck and engineer officers is projected. However, significant shortfalls of skilled unlicensed personnel are projected to begin as early as 1994. These shortfalls are the most severe in 2000. That is the year before 21 dry cargo ships are scheduled to be removed from the Ready Reserve Force, as shown in Table 1. The relative shortfalls and surpluses for each labor category in terms of supply versus the demand function are shown in Figure 5.

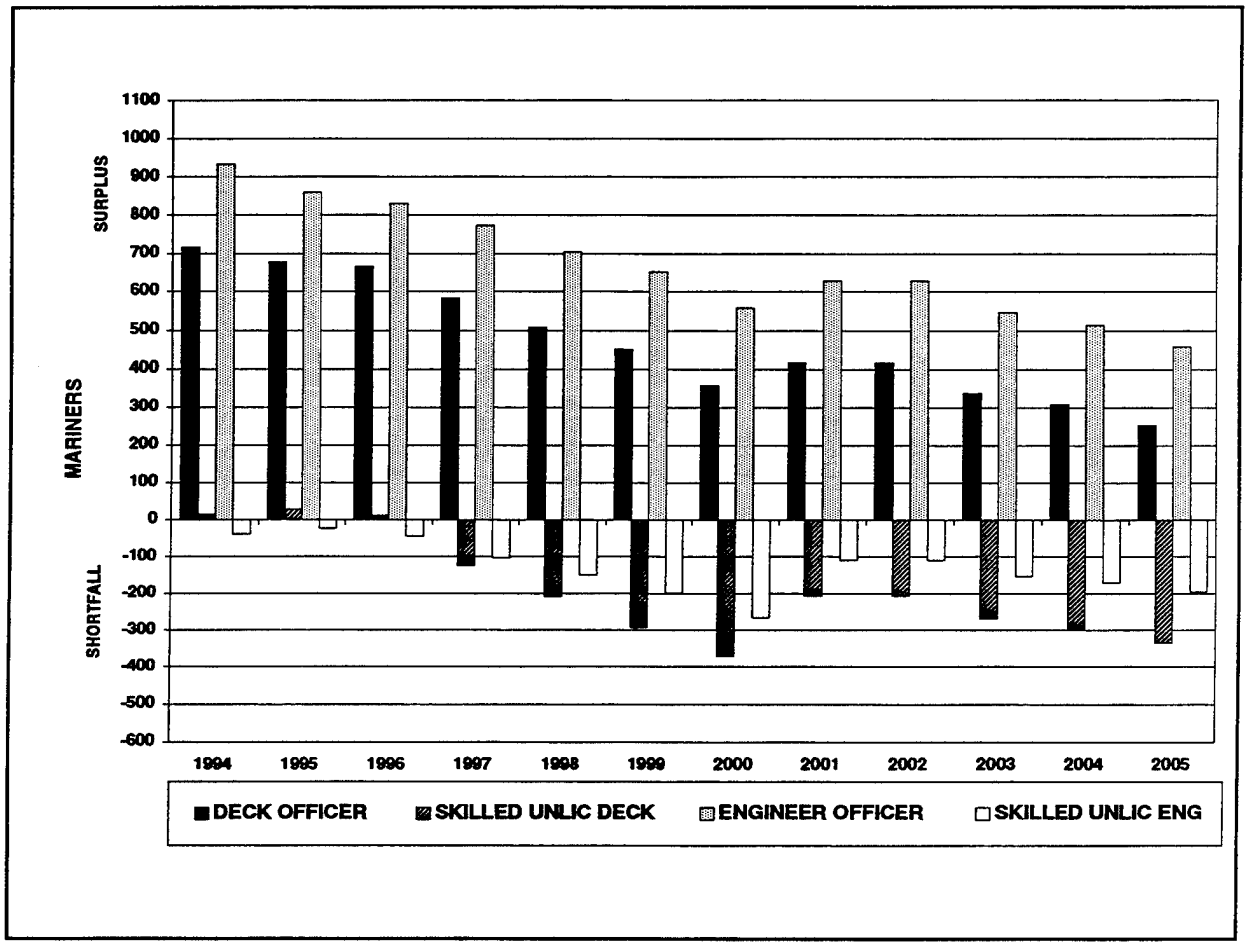
Figure 5
Mariner Shortfall Analysis - Case 1, Scenario II



(2) Case 2, Full Crew with Reduced Operating Status Crews

This Case would produce surpluses of licensed officers through the year 2005. However, shortfalls of skilled unlicensed personnel could begin as early as 1994 and are most severe in 2000. The relative shortfalls and surpluses for each labor category in terms of supply versus the demand function are shown in Figure 6.

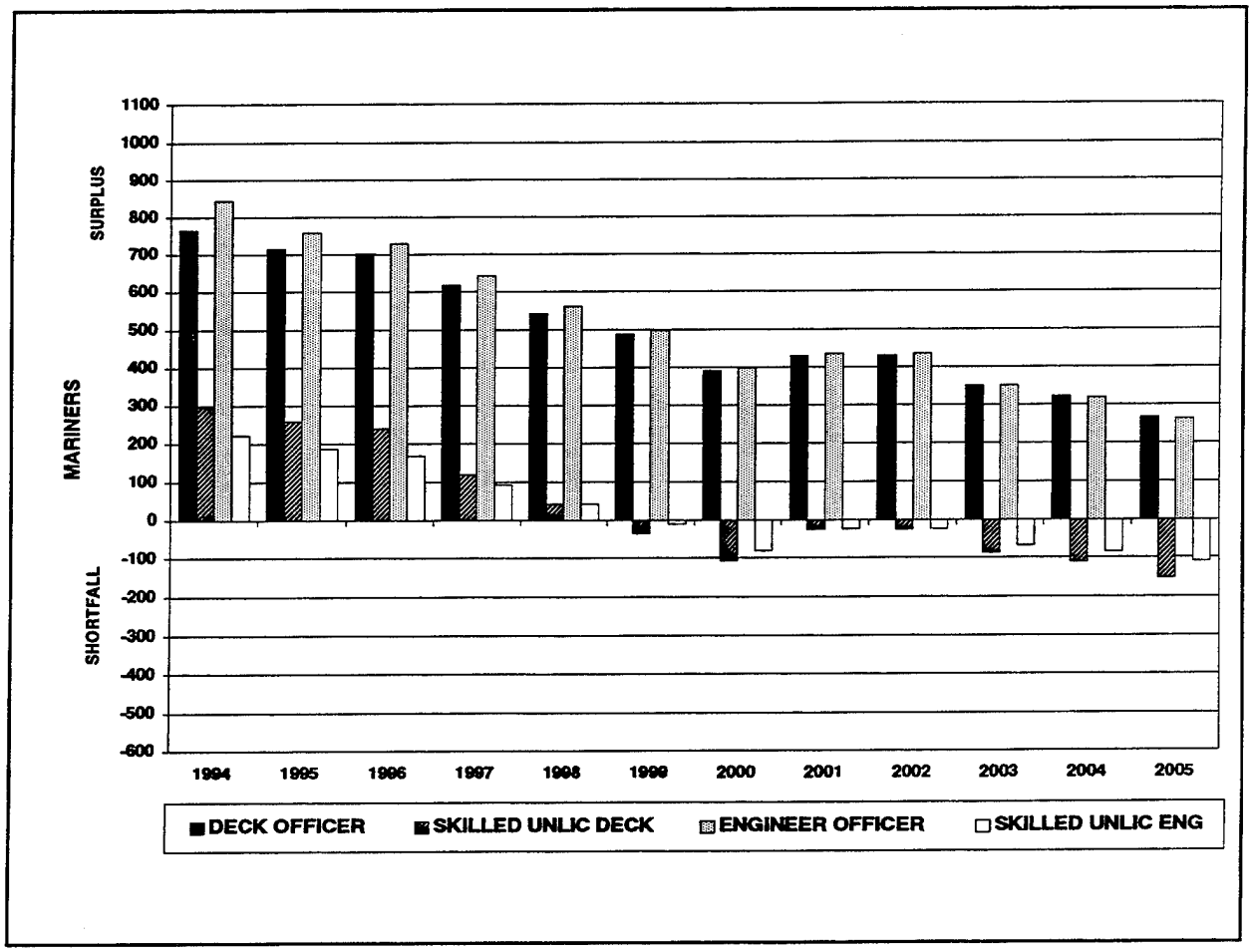
Figure 6
Mariner Shortfall Analysis - Case 2, Scenario II



(3) Case 3, Reduced Crew

In this Case, surpluses of licensed officers are projected through 2005. Moderate shortfalls of skilled unlicensed personnel in both the deck and engine departments are projected for the year 2005. These shortfalls and could begin to occur by 1999. However, since Ready Reserve Force ship crews would already have been reduced, these shortfalls could not be alleviated by having ships sail short-handed. The relative shortfalls and surpluses for each labor category in terms of supply versus the demand function are shown in Figure 7.

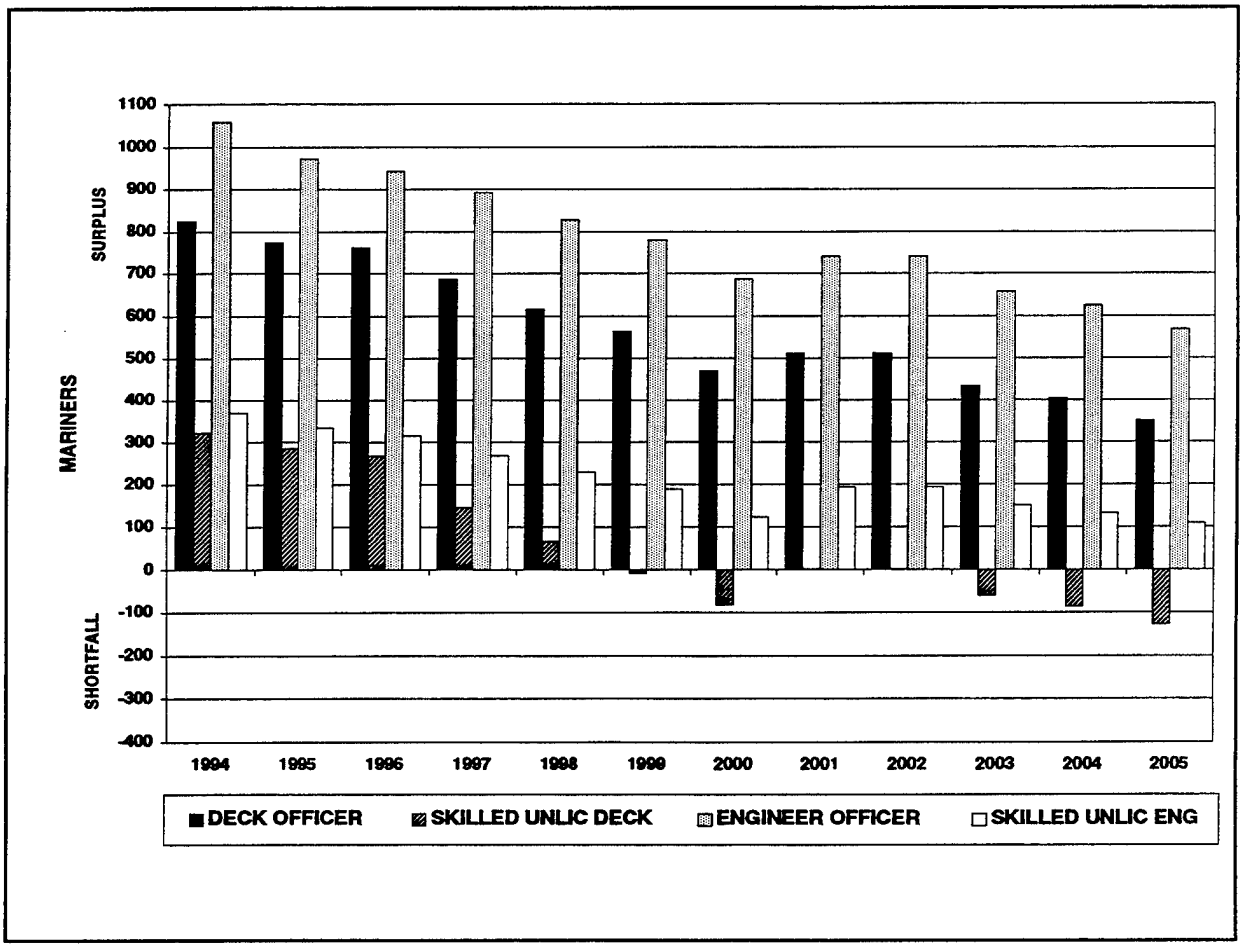
Figure 7
Mariner Shortfall Analysis - Case 3, Scenario II



(4) Case 4, Reduced Crew with Reduced Operating Status Crews

Case 4, with the enactment of the Maritime Security Program, is the least demanding or "best" Case of the 8 Case/Scenario combinations analyzed. The only projected shortfall for the year 2005 is for skilled unlicensed deck department personnel. A shortfall of skilled unlicensed deck department personnel first occurs in 1999 with a significant shortfall in the following year. The relative shortfalls and surpluses for each labor category in terms of supply versus the demand function are shown in Figure 8.

Figure 8
Mariner Shortfall Analysis - Case 4, Scenario II



C. Sensitivity Analyses

The use of assumptions in analysis is one means by which the effect of side issues may be recognized without being themselves analyzed in depth. This approach can save a tremendous amount of time. However, if the assumptions are incorrect the results of the entire analysis may also be incorrect or, at the very least, flawed. To

avoid this, individual assumptions are tested by a process termed "sensitivity analysis." Through this analytic process, the level of risk involved in making a specific assumption can be determined, at least in relative terms. Very simply, a sensitivity analysis repeats a portion of the analysis with that single assumption modified. The extent to which this alters results indicates the level of risk involved in making a decision based on that assumption.

When the analytic results change significantly in response to a modification of an assumption the analysis is considered to be "sensitive" to that assumption and a level of risk exists. On the other hand, if the analytic results do not change significantly the analysis is considered to be "insensitive" to that assumption and a very low level of risk exists. However, sensitivity to an assumption may not, necessarily, indicate that the analysis is flawed. Sensitivity may highlight actions or policy decisions that should have high priorities and identify the risks inherent in not doing so. This section will examine the results of these sensitivity analyses.

(1) Mariner Re-Employment Rights

Within the maritime industry, it is well understood that the career goal of nearly all mariners is to obtain a so called "permanent" job in which they return to the same billet aboard the same ship following their vacation. However, if an individual with a permanent job serves aboard a Ready Reserve Force ship while ashore on vacation, that permanent job will be lost. This is because when the person holding that billet goes ashore on vacation the billet must be filled. If the person scheduled to fill that billet is not available, the billet will be filled by another mariner. The result is that qualified mariners holding permanent jobs are hesitant to give up long-term employment for a temporary position, even at a higher grade. However, if mariners willing to sail on Reserve Sealift Fleet ships are guaranteed their permanent jobs following the crisis, this need not be so.

Quantifying the numbers of officers or skilled unlicensed personnel who would, or would not, be available if they did, or did not, have re-employment rights is inexact at best. However, to demonstrate the potential effects of enacting or failing to enact this legislation, the following methodology was devised. First, the supply of all mariners in each labor category was compared to the total crewing demand for that labor category. The total supply of mariners in each labor category was then re-calculated to include only those mariners who were not believed to have permanent positions. This new supply function was then compared to both the original (total) supply function and the crewing demand function.

Under current industry practice, only senior officers (Master, Chief Engineer, Chief Mate and First Assistant Engineer) and key unlicensed personnel (Boatswain and Electrician) have permanent jobs. Therefore, the second supply function reflects only the availability of junior officers (Second Assistant Engineer, Second Mate, Third Assistant Engineer and Third Mate) or non-key skilled unlicensed personnel

(Able Bodied Seaman, Fireman/Watertender, Oiler, etc.) The first, or total, supply function reflects the availability of all personnel.

Figures 9 and 10 display the effects of re-employment rights on the projected availability, through the year 2005, of engineer officers (Chief Engineer, First Assistant Engineer, Second Assistant Engineer and Third Assistant Engineer) and skilled unlicensed deck personnel (Boatswain and Able Bodied Seaman), respectively. This analysis was conducted for all 8 Cases/Scenario combinations. No significant differences in sensitivity were apparent among the various cases and scenarios, nor between the officer and skilled unlicensed labor categories.

Figure 9
Mariner's Re-Employment Rights Sensitivity Analysis
Engineer Officers: Case 2 - Scenario I

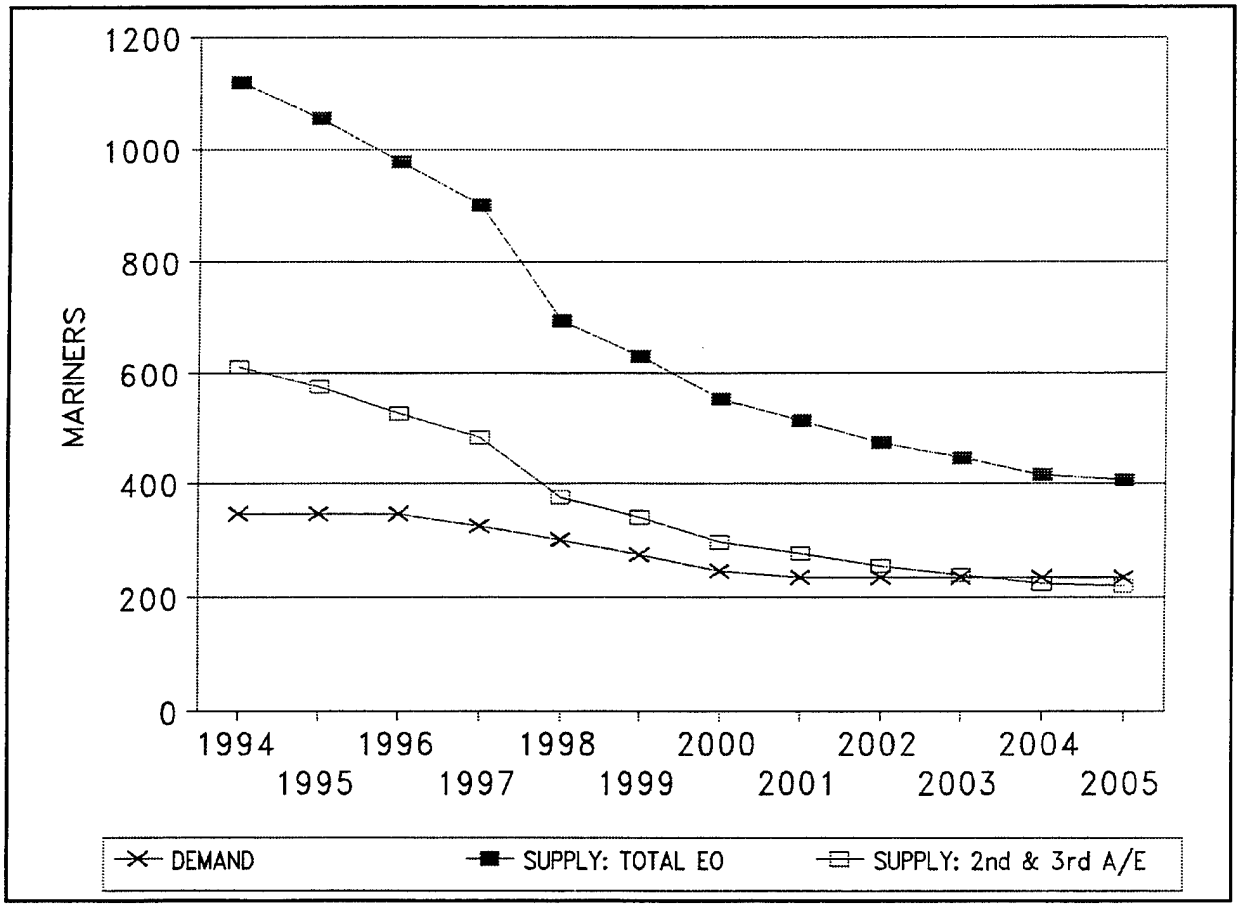
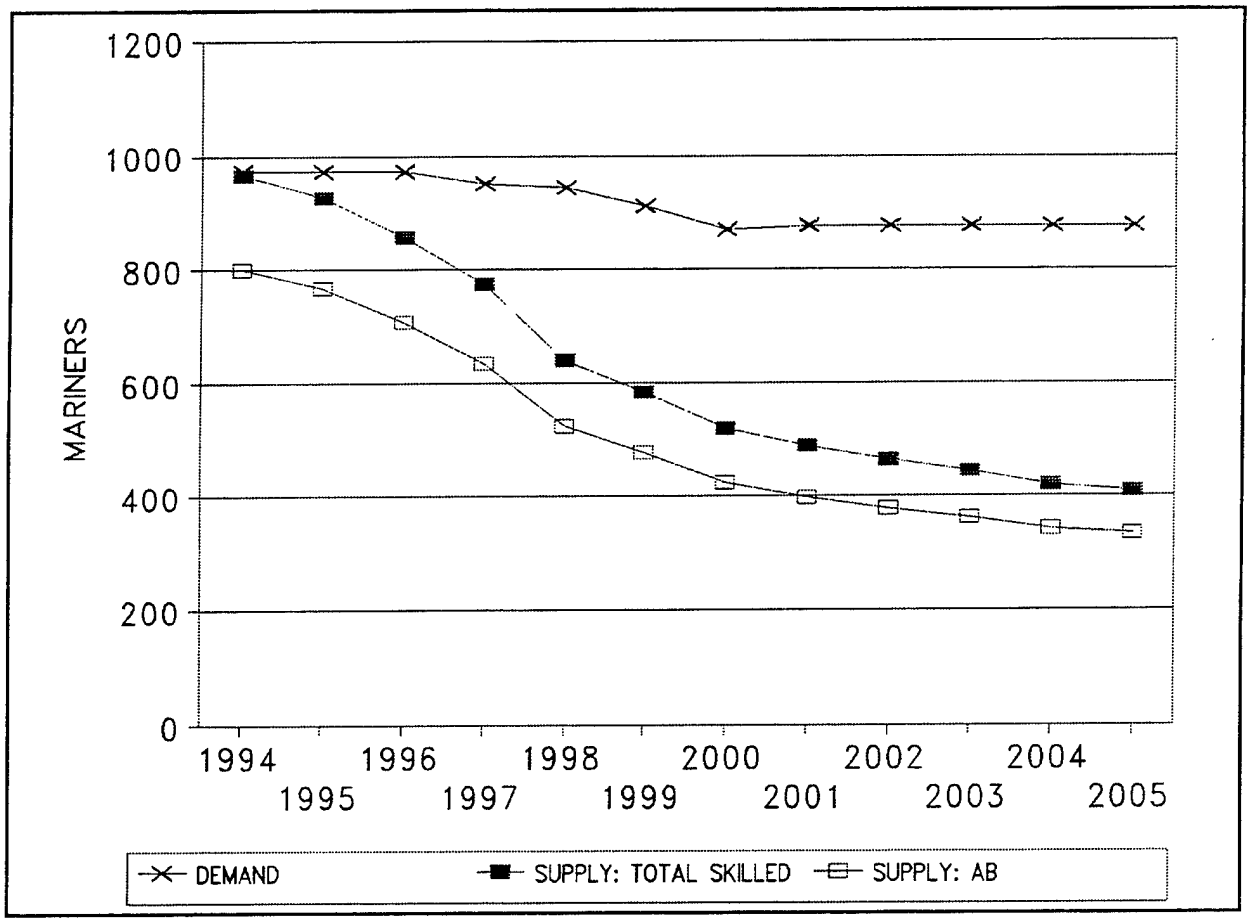


Figure 10
Mariner's Re-Employment Rights Sensitivity Analysis
Skilled Unlicensed Deck: Case 2 - Scenario I



It is apparent that the supply of both officer and skilled unlicensed personnel is sensitive to whether or not re-employment rights are enacted. However, the sensitivity of the supply of skilled unlicensed personnel to enactment of mariner's re-employment rights is significantly less than that for officers. This is due to the relatively small proportion of skilled unlicensed personnel who have permanent jobs. Without enactment of re-employment rights legislation, the projected minor shortfalls of officers would become larger and the projected surpluses, reduced or even eliminated. At the same time, shortfalls of skilled unlicensed personnel would increase only slightly. Therefore, failing to enact this legislation would have an overall negative impact on the supply of mariners available to crew the Reserve Sealift Fleet. Given the projected shortfalls of mariners, any action which would decrease these shortfalls in the commercial mariner labor pools should be encouraged and implemented.

(2) Efficient Use of Available Mariners

While the re-employment rights issue is, essentially, a personal one, the ability or inability to efficiently use all available mariners to crew the Reserve Sealift Fleet is a systemic issue. The system in question is the current commercial crewing system in which specific maritime labor unions are contracted to provide crews to specific ships, including Reserve Sealift Fleet ships.

In peacetime it is generally considered impossible for a mariner who is a member of one labor union to work aboard a ship contracted to another union. However, during a conflict or crisis the only readily available mariner for a key position may belong to a union which does not have a contract to crew that ship. In this case, the ship must either delay sailing until the billet can be filled from the contracted labor union or sail with that billet vacant. The former may take days and the Coast Guard may not approve the vessel's sailing if key billets are not filled.

Therefore, being able to assign a mariner belonging to one labor union to a ship whose crew normally are members of another union (cross-leveling) may make the difference between a timely sailing and a delayed sailing. The requirements analysis assumed that all available mariners would be able to accept assignments to any Reserve Sealift Fleet ship, if necessary. If, however, such an efficient use of maritime labor were not possible, would this impact Reserve Sealift Fleet crewing and, if so, by how much? Figures 11 and 12 illustrate this situation for one of the more demanding Case/Scenario combinations analyzed.

The labor unions shown in the graphs were selected for this analysis because they are contracted to provide crews to the majority of the ships in the Reserve Sealift Fleet. These unions are the American Maritime Officers (AMO) (Licensed Officers) and the Seafarers International Union (SIU) (Unlicensed Mariners). The Seafarers International Union includes two separate but affiliated labor unions, the Sailors' Union of the Pacific (SUP) and the Marine Firemen's Union (MFU). At this time, all Reserve Sealift Fleet ships are crewed either by these unions or by other maritime unions affiliated with the American Federation of Labor - Congress of Industrial Organizations (AFL-CIO). The "Total Demand" line on each graph is, therefore, also the "AFL-CIO" demand line.

Figure 11
Efficient Use of Available Mariners Sensitivity Analysis
Licensed Officers: Case 2 - Scenario I

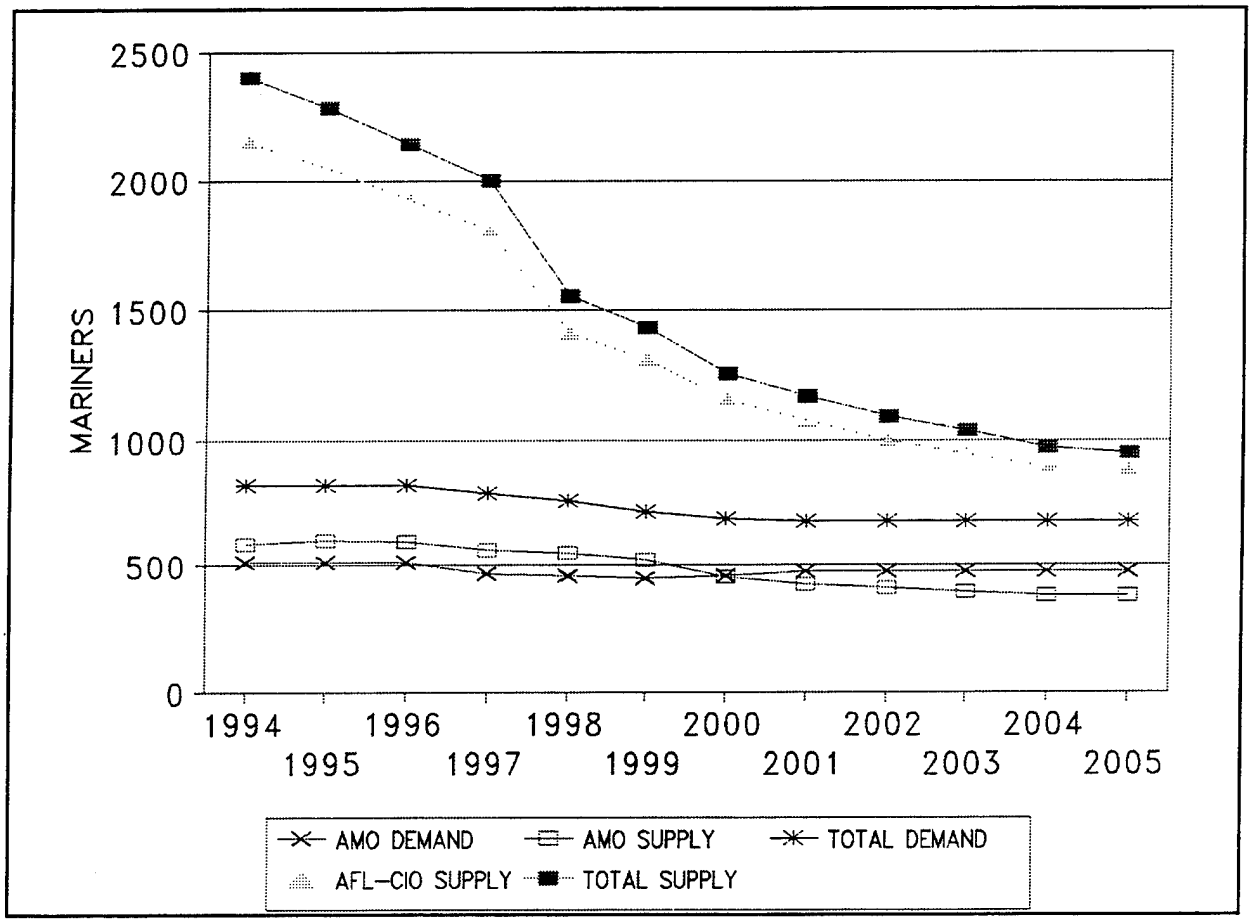
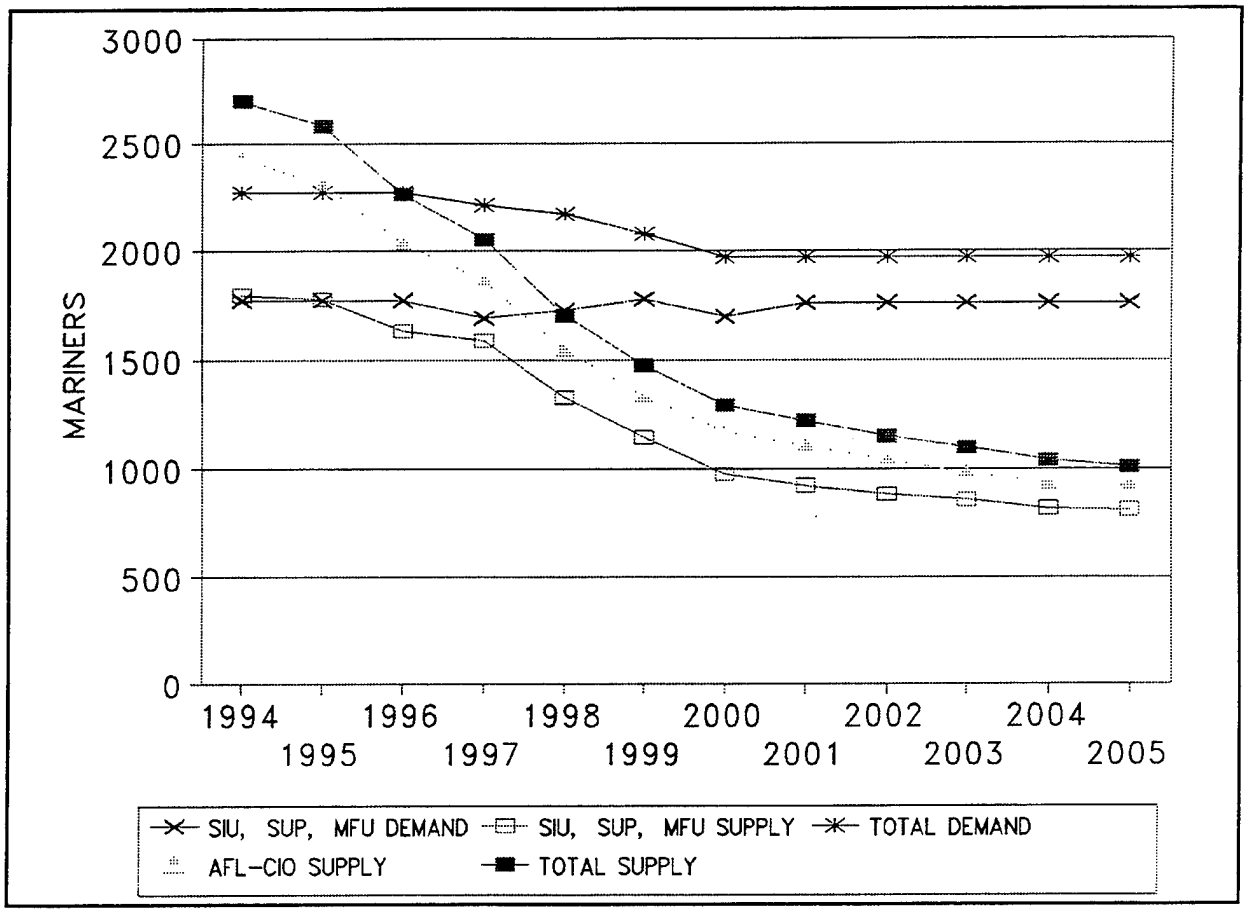


Figure 12
Efficient Use of Available Mariners Sensitivity Analysis
Skilled Unlicensed Personnel: Case 2 - Scenario I



The ability to crew all of the ships in the Reserve Sealift Fleet is, overall, only slightly sensitive to the ability to cross-level available mariners. Although there could be a shortage of AMO officers (Figure 11) to crew ships contracted with AMO, the total supply of officers exceeds the total demand by a much larger margin. This indicates that the minor projected shortfall could be more than offset if officers could be cross-leveled when required. In contrast, Figure 12 illustrates that shortfalls of skilled unlicensed personnel are so great that no amount of cross-leveling would have a significant impact.

Flexibility in assigning available mariners to Reserve Sealift Fleet ships is a valid goal whose achievement is a key element in the timely crewing of the Reserve Sealift Fleet. However, the requirements analysis as a whole is only slightly sensitive to the efficient use of available mariners. The reason is that any shortfalls caused by inefficient personnel assignment practices are overshadowed by the magnitude of the overall shortfalls in the supply of commercial mariners compared to the crewing demands of the Reserve Sealift Fleet.

(3) Accuracy of Fleet Projections

The requirements analysis was repeated using fleet projections that were a result of an independent assessment of the current U.S. flag commercial fleet. This assessment differed from the official Maritime Administration projections in several areas. However, there are no significant differences in the analytic results obtained between those based on the Maritime Administration's projections and those based on the independent assessment. Further, the difference in analytic results between Scenarios I and II, while apparent, are not of sufficient magnitude to generate a unique set of overall conclusions for either Scenario. The requirements analysis is not sensitive to variations of +/- 5% in the fleet projections, and would be only mildly sensitive to variations of +/- 15% in the fleet projections.

Similar analyses conducted for Part 3 are, in effect, also sensitivity analyses. These analyses showed that a reduction as large as 25% in the Reserve Sealift Fleet size would have no significant impact on the overall conclusions of the analyses. Thus, while the analysis is sensitive to fluctuations in the Reserve Sealift Fleet projections, it is more sensitive to the other assumptions being tested in each Case/Scenario. Differences of 1 or 2, even 5, ships in the fleet projections have no significant impact on the analysis.

Chapter 4
Summary

Commercial crewing shortfalls are neither balanced nor proportional among billet categories (deck officer, engineer officer, skilled unlicensed deck and skilled unlicensed engineer) in either Scenario. The projected impact of enacting the Maritime Security Program on the commercial mariner supply function, while positive and significant, is not sufficient to eliminate shortfalls in skilled unlicensed mariners except in Case 4.

Imbalances in the supply of officers versus skilled unlicensed personnel directly mirror trends in crew composition. The unlicensed positions are those upon which the changes in the ocean transportation industry have had the greatest impact. For instance, no more than 2 or 3 unlicensed engineers are required aboard a modern containership with an automated diesel propulsion plant. This is a significant reduction from the 10 or more unlicensed engineers in the "mission" crew aboard one of the steam propelled breakbulk ships of the Ready Reserve Force. The same modern containership would have an unlicensed deck department of only 6 or 7 persons rather than the 10 or more in the "mission" crew of a Ready Reserve Force breakbulk steamship.

Marginal shortfalls (less than 100, or approximately 1 person per ship) could be resolved, in some cases, through Coast Guard permission to sail short-handed and/or through enhanced commercial crewing efforts. However, shortfalls in the reduced crew cases (Cases 3 and 4) would be difficult to overcome by sailing short since the crew sizes would already have been reduced to the minimum. Altering the composition of the Reduced Operating Status crews to include more skilled unlicensed personnel would also have a positive impact. Another option would be to maximize the availability of mariners from other labor pools. Similarly, non-traditional sources such as the offshore towing and oil industries could provide a number of qualified skilled unlicensed personnel.

Significant reductions in the size of Ready Reserve Force crews and continued extensive use of Reduced Operating Status crews would minimize the projected shortfalls in the supply of skilled mariners to crew the Ready Reserve Force. Although in only one of the Cases analyzed is a shortage of licensed officers projected, shortfalls in the supply of skilled unlicensed mariners (480-130, as shown in Table 3, p. 1-10) are projected in every Case analyzed and may already exist. Projected shortfalls of skilled mariners are neither homogeneous nor proportional to shipboard billet structures.

The decision to keep a block of 21 designated dry cargo ships in the Ready Reserve Force until 2001 has a significant negative impact on the ability of the pool of available mariners to crew the Reserve Sealift Fleet. In every Case/Scenario the most severe, or second most severe, shortfalls of the entire 10 year period occur in

the year before these ships are removed from the Ready Reserve Force. All of these ships are older, breakbulk type ships which require relatively large crews. Removing the ships from the Ready Reserve Force earlier, or phasing them out over time rather than as a block, would alleviate crewing shortfalls early in the period and significantly reduce shortfalls prior to the year 2000.

It would appear highly unlikely, even in the extreme worst case, that whole ships could not be crewed. Rather, the likely situation is that the activation and sailing of numerous ships could be delayed due to the lack, in each case, of perhaps 2 or 3 skilled unlicensed members of the deck and engine departments (4 to 6 persons total). A program to provide complete crews for Ready Reserve Force ships large enough to overcome shortages among skilled unlicensed personnel would create a significant surplus of officers.

Enactment of the Maritime Security Program and its associated re-employment rights legislation reduced the projected shortfalls of skilled unlicensed mariners by 15% to 70%, depending on the Case, and eliminated the licensed officer shortfall in the one Case in which it is projected. Failure to enact re-employment rights legislation will significantly reduce the projected surpluses of licensed officers. Its impact on the supply of skilled unlicensed mariners, although less significant, will also be negative.

The analysis was relatively insensitive to both the ability to cross-level mariners across labor union jurisdictions and minor variations in the size of the Reserve Sealift Fleet. The ability to cross-level deck and engineering officers would eliminate the relatively small shortfalls within a given union. In contrast, the shortfalls of skilled unlicensed personnel are so great that no amount of cross-leveling would have a significant impact. However, significant reductions in the size of the Reserve Sealift Fleet will directly reduce crewing demand and, thereby, shortfalls.

PART 2

FEASIBILITY OF CREWING READY RESERVE FORCE SHIPS WITH U.S. NAVAL RESERVE PERSONNEL

Chapter 5
Naval Reserve Crewing Concept and Policy Issues

The requirement for a contingency crewing program of any sort, and its size, are analyzed and discussed in Part 1. One of the potential contingency crewing programs that this study evaluates is one in which Ready Reserve Force crewing shortfalls may be reduced or eliminated by using Naval Reserve personnel. However, before going any further, some basic principles of merchant marine crewing, and the differences between merchant marine and naval crewing, must be understood.

A. Merchant Marine Crewing

The Ready Reserve Force is comprised primarily of former commercial merchant ships. By longstanding agreement among the Maritime Administration, Department of Defense and the Congress, these ships, when activated, are crewed and operated like commercial merchant ships. One reason for this is that merchant ships are built and operated to move cargo quickly, efficiently and profitably. Even when a merchant ship is assigned the duty of a naval auxiliary it continues to function as a merchant ship. These fundamental differences in purpose and function are reflected in the composition of merchant ship crews and the level of training that each crew member receives.

Merchant ship crews are small, in some cases very small, when compared to the crew of a comparably sized naval vessel. Functions that may be performed by several different persons aboard a naval vessel must all be performed by one or two persons aboard a merchant ship. A typical bridge watch on a merchant ship consists of a watch officer, lookout and helmsman. The watch officer is solely responsible for the duties performed by (among others) the Officer of the Deck, Combat Information Center Watch Officer, Quartermaster, Boatswain's Mate, Signalman and Lee Helmsman aboard a U.S. Navy vessel.

There are few, if any, additional personnel aboard merchant ships to replace sick or injured crew members. Similarly, there are, in general, no crew members whose primary functions are to fight fires, process paperwork or inventory spare parts. Where those functions exist, they are collateral duties performed by a crew member with other primary duties. Watchstanding is the primary function of nearly every member of the crew. Maintenance is largely performed by off-watch personnel, although some maintenance work is done on watch. Therefore, virtually every person in the crew must have relatively high levels of watchstanding, maintenance and cargo handling skills.

The ratio of officers to unlicensed (enlisted) personnel aboard a typical merchant ship is 1 to 2. Based on published crew composition of several classes of U.S. Navy warships and auxiliaries, this ratio is approximately 1 to 15 for an average

Navy vessel. This reflects a significant difference in philosophy regarding whether officers or enlisted (unlicensed) personnel will have high levels of technical expertise (both theoretical and practical). Merchant marine crewing emphasizes technical expertise in the licensed officers. Warship crewing, at least in the U.S. Navy, emphasizes technical expertise in its senior enlisted and warrant officer personnel. Naval officers are considered to be, and function as, management generalists supervising technical experts. Merchant ship officers, as the technical experts, and with fewer seamen available for each job or function, spend a significant portion of their working day "doing" rather than "supervising". This creates a shipboard culture contrasting sharply with that of a naval vessel.

Significant shipboard training programs for basic job skill acquisition do not exist in the merchant marine. Every crew billet must be filled by a person who is either licensed or certified as qualified for that billet by the government under whose laws the ship operates. Training programs for licensing and certification of mariners are provided by federal and state maritime academies and labor union schools. Licensing and certification of mariners aboard U.S. flag ships is the responsibility of the U.S. Coast Guard. Regulations for merchant marine licensing and certification are contained in Chapter 46 (Shipping) Subchapter B (Merchant Marine Officers and Seamen) of the Code of Federal Regulations.

Advancement to a higher level of license or certification depends on achieving a specified level of experience and then passing a comprehensive examination. The experience requirement for advancement of a U.S. Coast Guard license is one year (365 days) of service (e.g., 1 year as Third Mate before advancement to Second Mate). When this experience level is achieved the officer may take the examination for the next higher grade of license. The examination content is based on the cumulative knowledge, both practical and theoretical, that is required to competently perform duties at the level being tested for. The examination for a senior level license such as Chief Mate or First Assistant Engineer may take as long as 5 full days to complete and have a minimum passing grade of 80%.

B. Naval Reserve Contingency Crewing Concept

This concept, detailed in Appendix I, envisions a Ready Reserve Force ship crew composed entirely of Naval Reserve personnel filling merchant marine billets. All persons involved in this program would have the necessary merchant marine skills to meet the requirements of their billets. As Naval Reservists, the ship's crew would be subject to involuntary recall to active duty.

A program based on this concept would be structured to provide a complete crew to each Ready Reserve Force ship assigned. The Ready Reserve Force ships assigned to the Naval Reserve would be those perceived to be the most difficult to crew from commercial sources: old, steam propelled, breakbulk general cargo ships. Of these most-difficult-to-crew ships, only those that could not be crewed

commercially would be assigned to the Naval Reserve. The ships would be returned to commercial crewing whenever, and as soon as, possible. Under this concept, no uniformed naval personnel would serve in the same crew with civilians.

The foundation of the Naval Reserve contingency crewing concept is that the Naval Reserve already has a number (over 3,000 since October 1993, through September 1995) of commissioned officers who possess U.S. Coast Guard licenses: the Merchant Marine Reserve. Only those Merchant Marine Reserve officers not actively employed at sea would be considered to support this concept. Naval Reserve enlisted personnel of appropriate rates and grades would be recruited to fill shipboard billets not requiring licenses. The primary source of these personnel would be current Naval Reserve ship augmentation units being disestablished as the Navy ships they support are decommissioned.

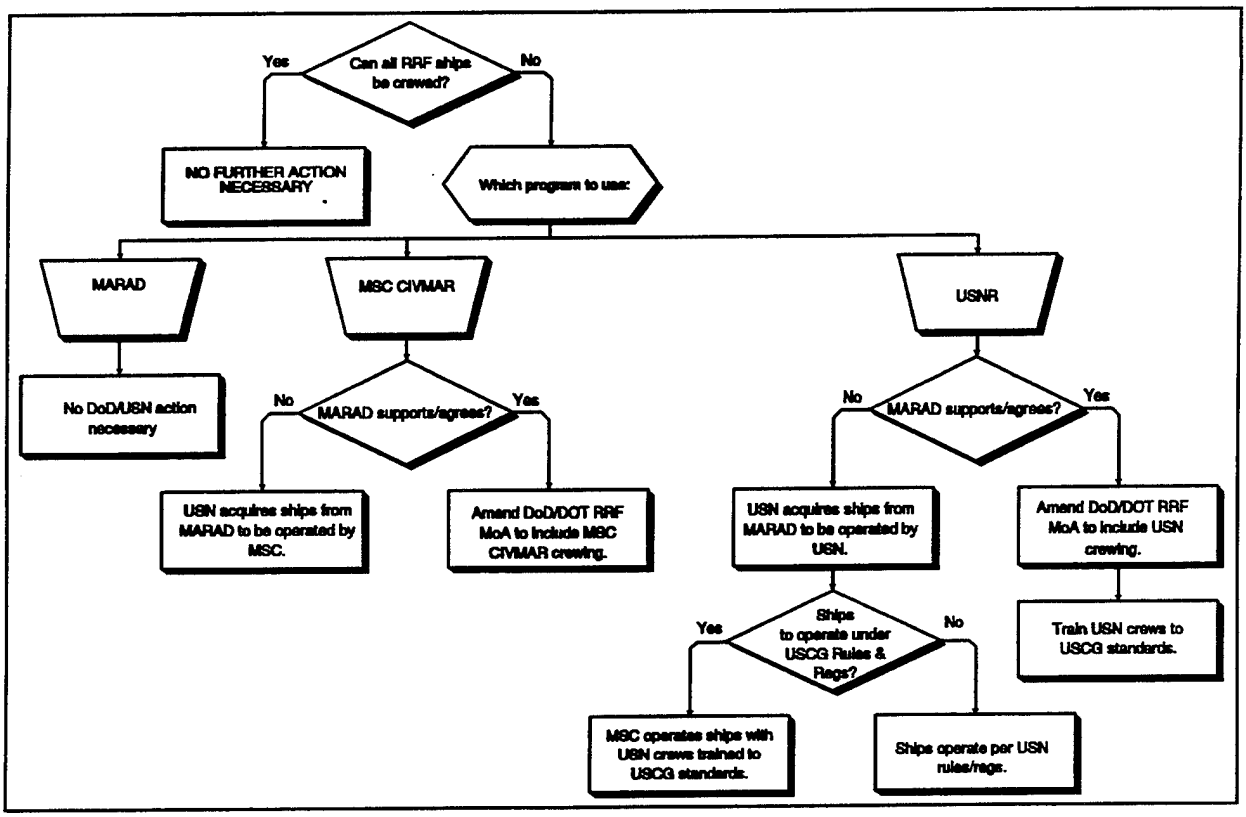
A key factor of this concept, as envisioned, is that the Ready Reserve Force ships being crewed by reservists be considered public vessels. By designating these vessels as public vessels, they could be exempted from any U.S. Coast Guard rules and regulations otherwise applicable to these ships. The Navy could then implement its own, ship/class-specific standards for training, crewing, maintenance and operations. Training to Navy rather than U.S. Coast Guard requirements would permit this program to use criteria other than at-sea experience to determine whether program personnel are prepared for higher levels of authority and responsibility.

C. Policy Issues

Several policy issues should be discussed before crewing the Ready Reserve Force with uniformed naval personnel can be considered in any detail. The first isssue is whether Ready Reserve Force ships can legally be crewed by uniformed naval personnel while the ships are in the custody of, and titled to, the Maritime Administration. Second, will merchant ships crewed by naval personnel be operated and maintained in accordance with the U.S. Coast Guard rules and regulations for merchant ships or in accordance with U.S. Navy rules, regulations and instructions? Third, is it reasonable to expect that Naval Reserve personnel will be available to crew Ready Reserve Force ships within the required timeframes? Fourth, can the current Naval Surface Reserve training cycle and training policy provide the level of training required to meet the readiness criteria of Ready Reserve Force ships? Finally, can Merchant Marine Reserve officers succeed to command at sea of a naval vessel? How these policy issues are resolved will have a significant impact on every other facet of the Naval Reserve program, including its feasibility. Some of these policy issues are diagrammed in flow-chart fashion in Figure 13.

It should be understood that no policy issue is insurmountable. If the need is great enough the policy issues will be resolved and the program implemented.

Figure 13
Ready Reserve Force Reserve Crewing Decision Tree



(1) Vessel Title

The relationship between the Departments of Defense and Transportation regarding the Ready Reserve Force is currently embodied in a Memorandum of Agreement dated October 30, 1988 (Appendix J). Two articles of the Memorandum of Agreement are particularly relevant. Article 6, "Manning and Operation of Ready Reserve Force Ships", states that "Ready Reserve Force ships will be operated under contract between the Maritime Administration and individual companies." This article goes on to state that, "On reactivation, Ready Reserve Force ships will remain under the contract to the Maritime Administration (Ship Managers) for the account of the Department of Defense." Article 13, "Temporary Transfer of Ready Reserve Force Ship" states that, "During the period of transfer, the assigned contractor shall remain responsible for the ship, including at-sea operations, under its contract with the Maritime Administration."

The Navy's Deputy Assistant Judge Advocate General for Administrative Law has reviewed the legal aspects of crewing Ready Reserve Force ships with naval personnel. That opinion (Appendix K) states:

> *"The statutory base of the National Defense Reserve Fleet and Ready Reserve Force [Merchant Ship Sales Act of 1946, as amended (50 USC 1744)] makes clear that the Department of Transportation is responsible for maintaining the Ready Reserve Force in readiness for reactivation and mobilization."*

With regard to providing whole crews of naval personnel to operate Ready Reserve Force ships, it continues:

> *"Nonetheless, if the national interest required use of the Ready Reserve Force because other commercial assets were not reasonably available, and Ready Reserve Force vessels could not be manned under the Ship Manager Contract agreements between the Maritime Administration and civilian companies, we believe the Department of Defense would be acting within its legal authority to accept vessels from the Department of Transportation 'as is' and provide whatever the necessary manning to accomplish the military mission assigned. Such a dramatic shift of responsibilities from the Department of Transportation to the Department of Defense should not take place without due deliberation."*

The opinion goes on to point out that:

> *"Additionally, since such a shift of responsibility encompasses a function assigned to the Department of Transportation by Congress, section 1744 of title 50 should be amended to include contingency manning provisions. Such a change would clearly establish military authority and responsibility to man Ready Reserve Force vessels on an emergency basis, would provide clear authorization for fiscal expenditures by the Department of Defense to establish the organizational structure and training necessary to implement such a plan, and would buttress Secretarial action to assign military crews to the vessels, if such assignments were challenged in court."*

In his conclusion, the Deputy Assistant Judge Advocate General states that:

> *"Acceptance of Ready Reserve Force vessels in an undermanned or unmanned condition is a significant shift of burdens from the Department of Transportation to the Department of Defense and any plan to do so must be fully coordinated between the Department of the Navy, Commander-in-Chief U.S. Transportation Command,*

Chairman of the Joint Chiefs of Staff and the Office of Secretary of Defense.

"Problems associated with manning Ready Reserve Force vessels should be addressed by the Department of the Navy with the Maritime Administration, Commander, Military Sealift Command and Commander-in-Chief, U.S. Transportation Command to reach mutually acceptable solutions.

"If a contingency plan to crew Ready Reserve Force vessels with military personnel is developed, the responsibility and authority for doing so should be formalized at least by Memorandum of Agreement between the Department of Transportation and the Department of Defense, and preferably by amendment to section 1744 [of Title 50 USC]. Appropriate command structure and billet authorizations, probably within the Military Sealift Command, should also be established."

The current Memorandum of Agreement and Deputy Assistant Judge Advocate General's review appear to preclude crewing Ready Reserve Force ships with naval personnel, at least during peacetime. It is also apparent that, without changing the statutory basis for the Ready Reserve Force, the Navy might experience some difficulty in obtaining from the Congress the necessary appropriations to implement such a program. However, if Ready Reserve Force ships cannot be crewed by commercial means, naval personnel could crew the ships if the Navy is specifically requested by the Maritime Administration to accept these ships without crews.

There are two potential resolutions to this issue. The first is for the Departments of Defense and Transportation to renegotiate the Memorandum of Agreement, and agree to support amending 50 USC 1744, to permit crewing some number of Ready Reserve Force ships with naval personnel. The second is for the Department of Defense to acquire from the Department of Transportation title to, and operate, those ships which the Department of Defense believes cannot be crewed through commercial means during a crisis.

(a) Renegotiation of the Memorandum of Agreement

The Memorandum of Agreement is presently being renegotiated to, among other things, recognize the involvement of the U.S. Transportation Command in Ready Reserve Force operations and related issues. These negotiations are being conducted between the Maritime Administrator, representing the Department of Transportation, and the Commander-in-Chief, U.S. Transportation Command, representing the Department of Defense. Changing the agreement to permit Naval Reserve personnel to crew some Ready Reserve Force ships would require the Maritime Administrator to agree that the Ready Reserve Force cannot be

adequately crewed by commercial means.

In an interview published in the May 1994 issue of *Sea Power* magazine, Maritime Administrator Albert J. Herberger, Vice Admiral, USN (retired), said that,

> *". . . the skilled mariners who will be needed to crew the Ready Reserve Force, to flesh out the fast sealift ships, and provide the pool of skilled mariners for the government fleet, must come out of the commercial fleet.*
>
> *"Having a program like the one we are pursuing* [Maritime Reform] *ensures that we have at least double that number of mariners. Those off-cycle mariners represent the skilled pool that you need for the government fleet. In the absence of that, you would have to go and create a Reserve program--which, again, becomes very expensive, and very questionable with regard to its currency."*

The position of the Maritime Administration thus appears to be that commercial crewing, augmented as needed by Maritime Administration programs, will be sufficient to crew the Ready Reserve Force. Given this apparent position, it seems highly unlikely that the Maritime Administration, unless so directed by higher authority, would support any restructuring of the statutory or other basis for the Ready Reserve Force. Without such a restructuring the Navy would not be able to provide full or partial crews for Ready Reserve Force ships unless specifically requested to do so by the Maritime Administration. However, the Maritime Administration position appears to be largely dependant upon enactment by the Congress of maritime reform. If maritime reform legislation is not enacted, the Maritime Administration's position on this issue may be reviewed.

(b) Acquisition of Ready Reserve Force Ships

If the Maritime Administration believes that all of the Ready Reserve Force ships can be crewed commercially and the Department of Defense does not, an impasse exists. Without the changes to agreements and statutes discussed above, the only way to resolve this impasse would be for the Department of Defense to acquire from the Department of Transportation those ships which the Department of Defense feels cannot be commercially crewed. Logically, these would be ships with recognized primary naval missions such as amphibious assaults and fleet operations. This would provide an appropriate argument for transferring the ships to Navy custody. There are expected to be about 30 such ships in the Ready Reserve Force. This number will be the maximum number of ships upon which the quantitative analyses throughout this study will be based.

(2) Ship Operating Standards

Ready Reserve Force ships are constructed, maintained and crewed in accordance with Coast Guard regulations for commercial vessels (Chapter 46, Code of Federal Regulations) and the vessel classification rules of the American Bureau of Shipping. Although these ships are public vessels and could be exempted from these rules and regulations, the Secretary of Transportation is required by 50 USC 1744 to have Ready Reserve Force ships meet commercial safety and crewing standards.

Naval vessels are constructed, maintained and crewed in accordance with an extensive array of instructions promulgated by, among others, the Secretary of the Navy, Chief of Naval Operations, Naval Sea Systems Command, Bureau of Personnel, President of the Board of Inspection and Survey, and the various Fleet and Type Commanders. These instructions, and the laws and regulations upon which they are based, apply to every vessel crewed by naval personnel regardless of whether it is in a "commissioned" or "in service" status. Investigation reveals that these regulations and instructions conflict, to some degree, with nearly every Coast Guard regulation applicable to Ready Reserve Force ships.

The Secretary of Defense is authorized by the Act of December 27, 1950 (64 Stat. 1120) to request, and be granted, waivers of the navigation and vessel inspection laws to the extent deemed necessary in the interests of national defense. However, the extent, manner and terms of these waivers are prescribed by the agency having jurisdiction over the navigation and vessel inspection laws. Currently this agency is the Department of Transportation, U.S. Coast Guard. The national defense waiver provision, while in theory capable of waiving all navigation and vessel inspection regulations, has historically been applied only for waiving specific requirements for relatively short periods during peacetime. Based on past history, neither the Department of Defense nor the U.S. Coast Guard view this waiver authority as being intended to waive compliance with all navigation and vessel inspection laws for an indeterminate period during peacetime.

The procedure to be followed by the Coast Guard in granting national defense waivers of navigation and vessel inspection laws is set forth in 46 CFR 6.01. A key provision of this regulation is that the individual authorized to approve a waiver *". . . reaches the conclusion that the urgency of the situation outweighs the marine hazard involved. . . . "* A blanket waiver of the navigation and vessel inspection laws was requested, and received, in 1958 and again in 1964 to *". . . permit vessels operated by or chartered to the Military Sealift Command to carry out their assigned missions."* However, these "waivers" did not, in fact, waive any of the navigation or vessel inspection laws. Both waivers served only to delegate authority for requesting specific waivers to the Commander, Military Sealift Command and to establish the procedures for requesting them.

A Memorandum of Agreement has been negotiated between the Coast Guard and the Military Sealift Command regarding Coast Guard inspection of Military Sealift Command ships. Commander, Military Sealift Command Instruction 4730.3E states that "No Military Sealift Command ship shall be permitted to sail without having aboard and posted a valid Certificate of Inspection or Coast Guard authorized waiver/permit to proceed." In the case of former naval vessels, these ships are, subject to the limitations of their characteristics, maintained to substantially the same standards as ships certified by the Coast Guard.

It is unrealistic to expect a public vessel to be operated in the total absence of operating and inspection standards that ensure the safety of the vessel, its crew and other vessels. Therefore, if a blanket waiver of Coast Guard regulations were granted, some alternate set of operating standards would have to be implemented. The only practical alternative for ships crewed by naval personnel would be the operating and inspection standards applicable to Navy vessels.

Discussions with numerous Navy offices responsible for shipboard material inspections, crewing and training have indicated that bringing civilian vessels into compliance with Navy operating standards would be onerous, expensive and time consuming. It was the unanimous conclusion of these knowledgeable individuals that Ready Reserve Force vessels crewed by naval personnel should be operated and maintained in accordance with Coast Guard regulations (46 CFR) and not Navy regulations and instructions. However, a significant number of Navy regulations and instructions would require modification or waiver before a program such as is envisioned could be fully implemented. A recent policy decision by the Secretary of the Navy authorizes major commands to waive provisions of those Navy instructions that are not required by law. A partial list of instructions which would require waivers is shown in Table 4.

Table 4
Chief of Naval Operations Instructions Requiring Waiver or Modification

1000.16G	*Manual of Naval Total Force Management Policies and Procedures*
1500.8M	*Military Training Planning Process*
1500.68A	*Naval Reserve Training Policy, Organization and Responsibilities*
3120.32B	*Standard Organization and Regulations of the U.S. Navy*
3500.23C	*Assembly, Organization and Training of Crews for the Commissioning of Navy Ships*
3500.34D	*Personnel Qualification Standards Program*
5310.18	*Ship Manpower Document/Squadron Manpower Document Development and Revision Procedures*
5311.7	*Determining Manpower, Personnel and Training Requirements for Navy Acquisitions*
5420.53B	*General Precept for the Conduct of Trials and Material of Ships and Service Craft*

(3) Recalling Naval Reservists to Active Duty

Involuntarily recalling large numbers of reservists to active duty has, throughout our nation's history, up to and including the Persian Gulf War, been viewed as a definite indication that this nation was ready to go to war. Therefore, recalling reservists is a decision made with due deliberation at the highest levels of government. It is for just this reason that involuntary recall of reservists to active duty can, at this time, be authorized only by the President. The initial Presidential authorities to involuntarily recall reservists are either Partial Mobilization (10 USC 673) or the Presidential Selected Reserve Call-Up (10 USC 673b). The former authority requires the President to declare a National Emergency and specifically invoke this authority. Under the Presidential Selected Reserve Call-Up authority, up to 200,000 Selected Reservists may be recalled for 90 days. This initial period may be extended for an additional 180 days. During the Persian Gulf War this authority was temporarily extended by Congress to 180 days with an extension of another 180 days. While permanent changes to this authority have been considered since then, the Congress has made no such changes.

The only time in recent history that this authority has been invoked for a large-scale activation of the Selected Reserve was for the Persian Gulf War. The initial steps leading up to the President's exercising the Selected Reserve Call-Up authority took approximately 30 days.[1] Some of that time may be attributed to following unfamiliar procedures. However, a significant amount of that 30-day period involved the lengthy process of identifying and validating exactly how many reservists were to be recalled. The reserve recall requirement, when finalized, was presented to the President as part of a coherent course of action to respond to the crisis. Once that course of action had been approved, and the necessary orders signed by the President, the Services were authorized, through the Secretary of Defense, to begin recalling reservists.

In the opinion of those responsible for implementing these processes, they may be speeded up, but not significantly, due to the amount of deliberation required. For planning purposes, the time from recall authorization until naval reservists report to their active duty assignments is 14 days. This may also be shortened by as much as 2 to 3 days with good planning and some advance preparation. A significant delay is inherent in the process of recalling large numbers of reservists for a crisis or conflict. However, recalling a small number of reservists for humanitarian missions, as in the 1994 Haitian operation, can be done somewhat more quickly. Appendix L is an unclassified excerpt from the Navy Capabilities and Mobilization Plan which details the Naval Reserve mobilization process and time requirements.

The effect of the time required to authorize the initial reserve recall and to physically order a reservist to active duty would have a significant impact on the

[1]The initial recall of reservists for the Persian Gulf War was less than 25,000 individuals.

availability of Ready Reserve Force ships crewed by Naval Reservists. For example, if the Presidential deliberation process were only one-half as long as it was during the Persian Gulf War, and the reserve recall process only 11 more days, Naval Reserve crews would not begin to activate their ships until nearly a month after the need for the ship became apparent. Ships required after the decision to recall reservists would not have their reservist crews until almost two weeks after they were requested. These are significant lengths of time compared to the 24 to 72 hour commercial manpower mobilization standards of the Ready Reserve Force.

There are two methods to reduce the amount of time required to get a Naval Reserve crewed ship underway. The first is to recall the crew for their two week Annual Training period. During that period the ship would be activated and begin loading cargo while the recall orders were processed. However, delay could still occur, despite computer technology, due to the large number of Annual Training orders which must be authorized. In addition, reservists can currently only be recalled for one Annual Training period per year. If the crew had already completed its Annual Training, this option would not be available. Also, a potential legal difficulty is that, currently, reservists on Annual Training may not be used for operational missions.

A second, similar, option is for the crew to volunteer for recall under Active Duty for Special Work orders. These orders, like any other reserve recall order, require a valid funding code before they can be issued. At present, the Navy neither programs nor budgets funds for such orders to meet crisis response requirements. Funding may be taken from peacetime operations or personnel accounts if the command in question feels that the crisis will warrant a supplemental appropriation from the Congress. The supplemental appropriation would be used, in effect, to repay peacetime accounts for the amounts expended in responding to the crisis.

A second issue with Active Duty for Special Work is that it is voluntary. Any crew member refusing to volunteer would have to be replaced with a volunteer from another crew. If a large number of reserve crewed Ready Reserve Force ships were being activated simultaneously, the personnel problems of matching volunteers with ships could be significant. In addition, the crews of those ships not activated would have to be reorganized with the remaining personnel.

If Ready Reserve Force ships crewed by Naval Reserve personnel cannot be available under current recall procedures within the readiness standards established for those ships (i.e., the number of days required to make the ship ready for sea), one of two things must be done to make the program successful. First, the current Selected Reserve recall authorities and procedures could be significantly changed to expedite the process. Alternatively, the readiness standards established for those ships crewed by Naval Reservists could be changed to allow for the time required to recall and mobilize their crews. To highlight these requirements, mobilization time requirements for reservists should be clearly stated in Operations

Plans or Operations Orders. Furthermore, the delays inherent in the complex reserve recall process (see Appendix L) must be accurately reflected in the Required Delivery Dates for reserve units in the Time Phased Force Deployment Database for each Operations Plan or Operations Order.

(4) Naval Surface Reserve Training Policy

In this age of global instability a crisis requiring the overseas deployment of U.S. forces may occur at, literally, a moment's notice. Because of this lack of warning time Ready Reserve Force ships must be ready, at all times, to be activated within the readiness time frame assigned to each ship. Given the small crew sizes of Ready Reserve Force ships, this means that all crew members for each ship must be fully qualified for their billets upon assignment. There will not be time during an activation for crew members to complete their training requirements.

Current Naval Surface Reserve policy is that each member of the Selected Reserve is assigned to a specific mobilization billet. Only those individuals assigned to mobilization billets receive drill pay. The qualifications for every mobilization billet are detailed in the Reserve Billet Training Requirement for that billet. Designation as being fully mobilization qualified requires completing all of the billet training requirements. The current Naval Surface Reserve training policy is that individuals have a maximum of three years to fulfill at least 80% of their mobilization billet training requirements. Many reservists become fully mobilization billet qualified within 12 to 18 months. However, the minimum standard of the Naval Reserve is for reservists to be almost or nearly qualified to fill their mobilization billet after three years of training to meet its specific requirements.

At the end of that three year period, naval reserve officers are strongly encouraged or, in the case of senior officers, required to transfer to another Naval Reserve unit and start the process over again. It should be noted that in merchant marine crews, and therefore within this Naval Reserve crewing concept, the officers fill the billets which require the highest qualifications and skill levels. Should this element of the current Naval Reserve training policy be applied to merchant type ships crewed entirely by Selected Reservists, the number of fully qualified officers might never exceed 30 to 40% of those assigned.

One major training challenge for the Naval Reserve is that there is only one 12- to 17- day block of time each year in which to conduct extended training. For this reason, the Naval Reserve is highly dependent on recruiting former active duty personnel who have already received intensive skill acquisition training such as "A" School for a particular rate or Surface Warfare Officer's School. Even with a high entry level of skills/qualifications, two days per month and 12 to 17 days per year are not sufficient to retain skills at active duty levels. This decay in skill levels is acceptable in mobilization billets which are essentially staff or office work type billets, rather than operational shipboard or aircraft billets.

Those units which are assigned to operational ships or aircraft, so-called "hardware" units, are allotted more than the standard 24 paid drill days per year in which to conduct underway or flight training. Ships of the Naval Reserve Force drill an additional 1/2 day each month so that the ship can get underway for two nights instead of one. Aviation units, because of the high level of skill retention required to fly high performance military aircraft, have what amounts to nearly unlimited paid drills for unit personnel. In return for the high number of paid drills the Naval Air Reserve is essentially combat ready at all times.

The readiness level of Naval Air Reserve aircraft squadrons is essentially the same as that which Naval Reserve units responsible for crewing Ready Reserve Force ships must have if the ships are to be available on the short notice that is currently expected of them.

This level of readiness can only be maintained so long as the persons assigned to Ready Reserve Force ships already have the necessary Coast Guard qualifications for their billets (e.g., Third Mate's license or Qualified Member of the Engine Department certificate). With personnel already having basic qualifications when they report aboard they are essentially mobilization billet qualified with the exception of those few items specific to only that ship. The challenge arises when a person who does not possess the basic Coast Guard qualifications is assigned to a Ready Reserve Force mobilization billet. This may happen for any of several reasons, but "why" is not as important as what is to be done with a basically unqualified person. Such individuals may not be even generally qualified for their mobilization billets and, through no fault of their own, might endanger the lives of the crew, the ship and other ships if required to fill that billet.

Situations like this have arisen within hardware units, most notably when an aviation squadron transitions from one type of aircraft to another. For instance, very recently Naval Reserve A-7 Corsair squadrons were re-equipped with F/A-18 Hornets. Every A-7 pilot who wanted to fly the F/A-18 was required to dedicate 30 continuous days of active duty to complete the F/A-18 transition syllabus at the F/A-18 Fleet Replacement Squadron. In order to complete the training within the 30 days classes, simulator exercises and flights were scheduled 8 hours a day, 6 days a week, with additional time available after hours for remedial training.

A similar training syllabus would be required for a non-Merchant Marine qualified officer to pass the Coast Guard license examination for the level appropriate to the intended mobilization billet. For enlisted personnel a 15 day course of similar intensity would be sufficient. To ensure that all personnel meet general billet qualification standards before assignment to Ready Reserve Force mobilization billets, a group of individuals in an "in-training" or awaiting assignment status would have to be established. This would be similar in concept to an aviation Fleet Replacement Squadron. Naval Reserve crews for Ready Reserve Force ships could be expanded to include unskilled mobilization billets, such as Ordinary Seaman, for

individuals working to attain skilled billet qualifications. These individuals could not, in any event, be assigned to skilled mobilization billets such as Able Bodied Seaman, until they had completed the required training. Assignment to unskilled mobilization billets would be for a maximum of one year. After one year those who could not meet qualification requirements for skilled billets would be dropped from the program. Those qualified would be eligible for assignment to appropriate, available skilled mobilization billets.

(5) Command of Merchant-Type Ships Crewed by Naval Reservists

The use of officers who hold the proper Coast Guard licenses and have the necessary experience to fill billets aboard these ships is a vital element of this program. However, U.S. Navy vessels must be commanded by a naval officer who is qualified for command at sea and only those officers designated as Unrestricted Line officers may be assigned to duty as Commanding Officer of a naval vessel. According to 32 CFR 700.701 (U.S. Navy Regulations) the term commanding officer includes ". . . aircraft commanders, officers in charge (including warrant officers and petty officers when so detailed) and those persons standing the command duty." Officers in the Merchant Marine Reserve are designated as Special Duty or Restricted Line officers. The term "restricted" in this case means restricted from succession to command at sea of a naval vessel. Therefore, it would appear that Merchant Marine Reserve officers could not, at present, be assigned to command Ready Reserve Force ships crewed by naval personnel although they would be the best qualified to do so.

The issue of eligibility for command at sea is only applicable to deck officers in the Merchant Marine Reserve. Engineering officers in the merchant marine already function effectively as Special Duty or Restricted Line officers as they cannot succeed to command of the vessel. Only deck officers may command a merchant ship and that chain of succession runs through all deck officers and seamen before it would reach the engineering officers. The Merchant Marine Reserve is structured so that each type of license (deck, engine, deck/engine and radio) has a discrete designator within the naval personnel system. Therefore, this issue could be resolved by including Merchant Marine Reserve Deck Officers within the definition of Unrestricted Line officers by either defining their current designator (1625) as being an Unrestricted Line Officer or assigning those deck officers assigned to this program an Unrestricted Line Officer designator.

Chapter 6
Naval Reserve Contingency Crewing Program Organization

The challenge of organizing a Naval Reserve Contingency Crewing program is that it must meet the needs of two entirely different systems of ship operation and management (merchant marine and naval) with essentially the same group of people. First, and ultimately the most important, is that the merchant marine or functional organization aboard ship support the safe, efficient and seamanlike operation of the vessel at all times. Second, the naval organization must adequately support the requirements of naval customs, traditions and administration. To accomplish this some crew members will have to fulfill the requirements of two different positions.

Beyond the question of how the ship's crew itself is organized lie three additional issues. First, to what organization or organizations are the crew responsible and under what conditions do those relationships change? Second, what organizations will manage the program and how will they relate to each other? Finally, what organization will be responsible for maintaining the ships when they are inactive and logistically supporting them when they are activated? For brevity and clarity these discussions will be kept at relatively low levels in the various chains of command.

A. Program Management

There are four basic elements to Naval Reserve program management. These are the Program Resource Sponsor, the Program Technical Manager, the Gaining Command and the Reserve Program Manager. Each organization tasked with these responsibilities could require some additional personnel to fulfill program requirements. Exactly how many additional persons, if any, would be required to manage this program has not been fully determined and is beyond the scope of this study.

A Resource Sponsor is either a Deputy Chief of Naval Operations or the Director of a Major Staff Office who has been assigned responsibility for a specific program or group of programs by the Chief of Naval Operations. This responsibility involves the planning, programming and budgeting to provide the resources required to meet program goals or commitments. The Chief of Naval Operations has assigned the responsibilities for merchant marine related programs to the Deputy Chief of Naval Operations (Logistics), Logistics Plans and Policy/Strategic Sealift Plans Division (N42), which would be the logical Resource Sponsor for this new program.

The Program Technical Manager is responsible for providing to the Chief of Naval Reserve and the Commander, Naval Surface and Air Reserve Forces, the mobilization billet structure, billet qualification requirements and standards, technical training and program quality control. The Technical Manager is generally,

but not always, a major command that reports or is responsible to the Resource Sponsor for a particular program. The reserve units which the Program Technical Manager oversees report to, or are "gained" by, the Program Technical Manager or a command subordinate to the Program Technical Manager when those reserve units are placed on active duty. Since Commander, Military Sealift Command is already the Technical Manager for many Naval Reserve strategic sealift programs, technical management of a Naval Reserve contingency crewing program should also logically be assigned to it.

Gaining commands must have close relationships with reserve units that will be assigned to them. The close relationships between the gaining command and its reserve units and between the gaining command and the Program Technical Manager are a vital element in communicating reserve unit readiness and training needs. The most logical subordinate organizations to Commander, Military Sealift Command to be assigned the responsibilities as Gaining Commands would be the two major area commands: Military Sealift Command, Atlantic, presently located in Bayonne, New Jersey, and Military Sealift Command, Pacific, presently located in Oakland, California. Ships, and their crews, for this program would be assigned to these Gaining Commands based on their geographic locations.

Finally, within the staff of the Commander, Naval Surface (or Air) Reserve Force is the Reserve Program Manager. The Reserve Program Manager is basically responsible for ensuring that the reserve units under its responsibility are meeting their training requirements. To do this the Reserve Program Manager functions essentially as the conduit through which personnel and training funds flow to the reserve units to accomplish their assigned training. The Reserve Program Manager works closely with the Program Technical Manager to ensure that training requirements can be met within the Naval Reserve training structure, that mobilization billets are filled, and that the units are in the highest possible state of readiness. Finally, the Reserve Program Manager is responsible for certain aspects of administrative procedures that are unique to the Naval Reserve. The current Merchant Marine Reserve Program Office would be the appropriate organization to be Reserve Program Manager for a Naval Reserve contingency crewing program.

B. Inactive Ship Management and Logistic Support

The only organization within the U.S. Navy that is deemed qualified and competent to manage the maintenance and logistic support of merchant type ships is the Military Sealift Command. However, it is believed that the Military Sealift Command does not have the staff available to take on additional responsibilities to maintain and logistically support a significant number of additional merchant type ships. Even if the actual work is contracted out, some Military Sealift Command employees would be required for contract oversight, management and quality control of the work and services performed. These functions require persons with specific expertise and experience in merchant ship operations, engineering,

maintenance, contracting and purchasing. Discussions with Military Sealift Command personnel indicate that as many as 35 full-time positions would logically need to be transferred from the Maritime Administration to the Military Sealift Command staff to administer these requirements for those ships transferred from the Department of Transportation to the Department of Defense as previously discussed. Depending on several variables (actual number of ships, ship locations, contracting forms, and support organization) fewer full-time positions could be required. The need for additional personnel is based upon Military Sealift Command fleet growth projections over the next 10 years combined with an assumption that few, if any, additional positions will be authorized during this fleet expansion.

C. Reporting and Command Relationships

Military units generally have two chains of command, operational and administrative. Naval Reserve units however, have what may be considered to be two sets of administrative and operational chains of command. Which set is in force depends on whether or not the unit has been activated. The first set may be thought of as the inactive duty chains of command and would be in effect until the unit is activated. The second set becomes effective only when the unit is activated and may be thought of as the active duty chains of command.

(1) Inactive Duty

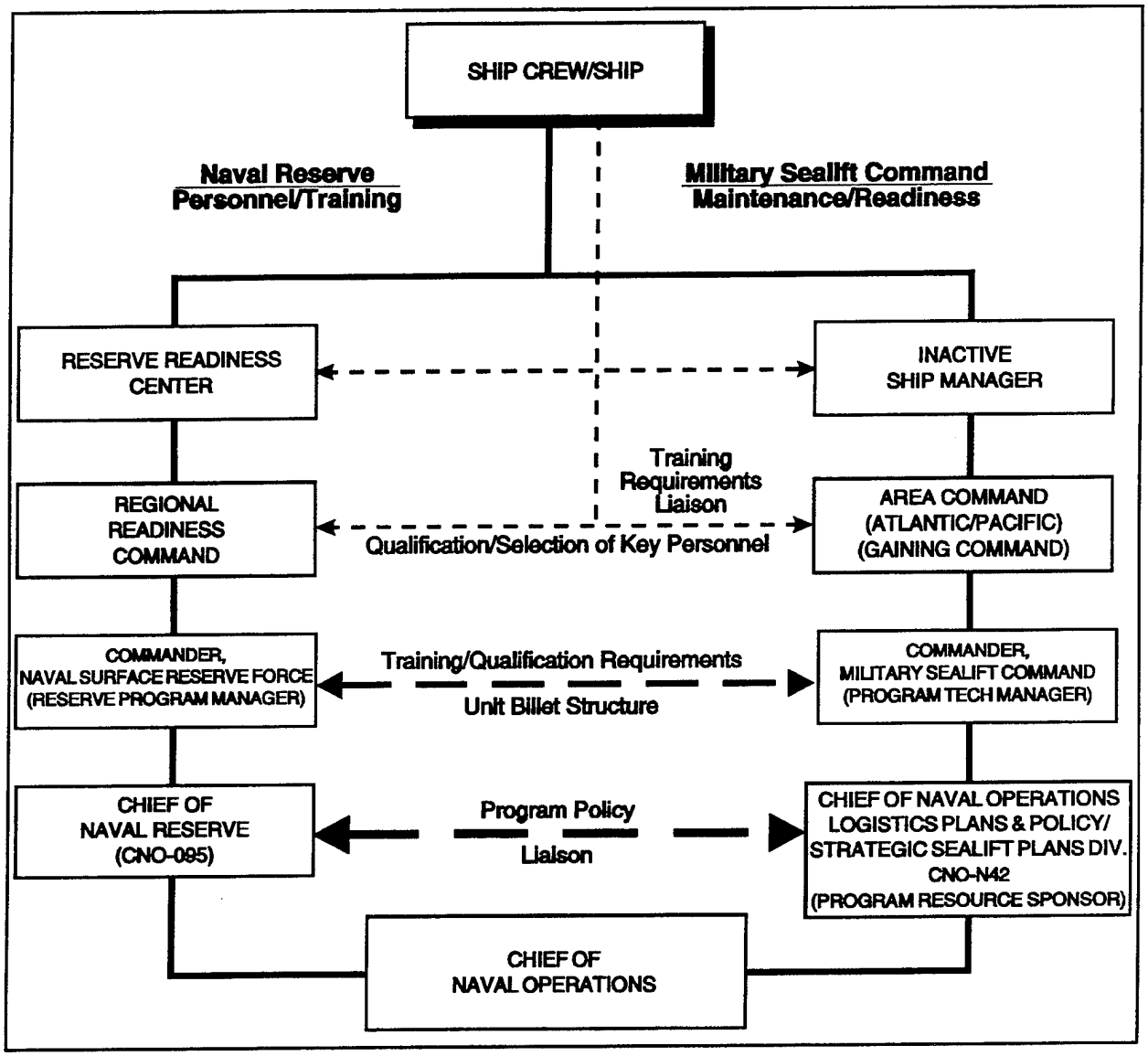
The two inactive duty chains of command for this program are those that are responsible, respectively, for personnel and material. In effect, the Commander, Naval Surface Reserve Force chain of command would be the administrative chain in this circumstance since it would "own" the program and personnel. Similarly, the Commander, Military Sealift Command would be the operational chain of command since Military Sealift Command would "own" the ships. This relationship is shown in Figure 14.

The most significant organizational issue for the inactive duty chains of command with regard to this program is which chain of command, Naval Reserve or Military Sealift Command, will select and assign the senior officers for each ship. Senior officer selection and assignment is very carefully controlled by the highest echelons of the Naval Reserve chain of command. Senior officers (Commanders and Captains) and unit Commanding Officers are selected for assignment by formal Selection Boards. These boards are convened by the Regional Readiness Commanders with a Naval Reserve Flag Officer as President. The selection board process has, in recent years, become more formal and more inclined toward both quantitative and qualitative analysis of the merits of officers applying for billets.

Since these Billet Selection Boards have a similar status to those convened for officer promotion, the President and Members of each Board may not receive

communications from individuals or organizations other than those officers being considered by the Selection Board. Therefore, suggestions or recommendations by the Gaining Command for officers to fill these billets may not be considered by the Selection Boards.

Figure 14
Inactive Duty Chains of Command



Once each Selection Board has completed its deliberations the list of selectees is forwarded to Commander, Naval Surface Reserve Force for approval. At this point the Gaining Command may, in certain cases, request that the Commander, Naval Surface Reserve Force not approve one or more specific decisions of a Selection Board. Such a request is not automatically granted. Once billet assignments have been approved, officers receive orders to their new billets.

The Naval Reserve selection process is intended to select, from officers with similar backgrounds and accomplishments, those best qualified to fill billets of a largely administrative nature. This does not necessarily qualify the members of these Selection Boards to fill the senior officer billets aboard merchant ships. In contrast, Masters and Chief Engineers of Military Sealift Command ships are selected by a Promotion Board representing their peers and the highest levels of Military Sealift Command leadership. The membership of these boards includes 4 Masters, 4 Chief Engineers, the Atlantic and Pacific Area Commanders, and the Headquarters, Military Sealift Command Directors for Operations and Engineering. The President of the Board is the Deputy Commander, Military Sealift Command. The highly technical nature of this Promotion Board differs markedly from that of the Naval Reserve Billet Selection Boards.

A major reason for this difference is that the officers assigned to Master, Chief Engineer, Chief Mate and First Assistant Engineer billets have responsibilities and authority equivalent to the Department Heads, Executive Officers and Commanding Officers of naval vessels. Of particular note is that merchant marine Chief Engineer's duties, position and status aboard ship differ significantly from those of the Chief Engineer on a naval vessel. A merchant marine Chief Engineer is, for all practical purposes, the Commanding Officer of the propulsion plant and its auxiliary machinery. While the Chief Mate, as the senior deck officer next to the Master, can be thought of as "second-in-command" there is no merchant marine equivalent to the Navy position of Executive Officer. In terms of status, the Chief Engineer outranks the Chief Mate and is virtually equal to the Master.

The importance of these positions is recognized in Commander, Military Sealift Command Instruction 12330.1A (Requirements and Procedures for Master and Chief Engineer Selection Board) (Appendix M):

> *"Masters and Chief Engineers hold key management positions aboard MSC ships. They must exemplify the highest standards of leadership, professionalism, and personal integrity. Mariners selected for these positions will demonstrate they are fully capable of meeting demands of assignment and willing to accept the increased responsibility and accountability associated with such positions."*

This disparity in personnel selection methods could be resolved by establishing a procedure under which officers desiring to fill billets in this program would be first screened by a Military Sealift Command Qualification Board. Those officers found qualified for billets would be identified to the various Naval Reserve Readiness Command Selection Boards. The Selection Boards would then fill officer billets in the program from those screened.

(2) Active Duty

When a Naval Reserve unit is activated, administrative responsibility is transferred from the Naval Reserve chain of command to the Gaining Command's administrative and operational chains of command. In this case what was the "operational" chain of command during the inactive duty period (Commander, Military Sealift Command) becomes the administrative chain of command. When the ship is determined to be, in all respects, ready for its intended mission, it will be assigned to the combatant command of one the Unified or Specified Commanders-in-Chief.

Chapter 7
Naval Reserve Personnel and Training Requirements

The heart of any reserve or contingency crewing program is its personnel and the training they require to be able to perform their assigned duties. For the Naval Reserve concept the first step is to establish basic equivalencies between Navy qualifications and the qualifications required to fill billets aboard merchant type ships. Once these are established, the numbers of Selected Naval Reservists qualified to fill merchant marine billets or who could be quickly trained to merchant marine standards can be determined. The purpose of this analysis is to determine whether or not there are currently sufficient persons in the Naval Reserve with the necessary qualifications to meet the crewing, training and attrition requirements of a 30-ship contingency crewing program. The results of this analysis generate the requirements for program recruiting and training.

A. Navy/Merchant Marine Qualification Equivalencies

The qualifications for merchant marine licensing and certification are contained in 46 CFR Part 10 (Licensing of Maritime Personnel) and Part 12 (Certification of Seamen). These requirements were compared to the Navy Personnel Qualification Standards for a number of Naval Officer Billet Classification Codes and Naval Enlisted Codes. Several Naval Officer Billet Classification Codes are already assigned to officers based on their Coast Guard licenses. The results are shown in Tables 5 and 6, respectively, for merchant marine Deck and Engineering Departments. Of particular assistance in comparing enlisted qualifications to merchant marine standards were a U.S. Coast Guard Memorandum on this particular subject and an extract from the U.S. Coast Guard Marine Safety Manual which are both included in Appendix N. There are very few specific qualification requirements for merchant marine food preparation, medical and administrative support billets, so that naval personnel with appropriate backgrounds and experience could be assigned to those billets without additional training or Coast Guard certification.

Research shows that, in general, qualification standards for Navy enlisted personnel in appropriate rates are essentially equivalent to merchant marine certification standards. Further, some senior enlisted personnel (pay grades E7-E9) have qualifications nearly equivalent to several grades of engineering or deck officer licenses. However, naval officer qualifications are not nearly so equivalent to the qualifications required for licensed billets. This difference in qualifications is due, in large part, to the differences between Navy and merchant marine organizational and training philosophies.

Table 5
Merchant Marine/Navy Qualification Equivalencies for Deck Department

Merchant Marine Billet	Sea Time	Navy Rank	Navy Qualifications (NOBC/NEC)	Remarks
Master	10+ Years	CAPT/CDR	Commanding Officer Afloat (9222)	Deep draft command experience is highly desirable.
Chief Mate	8+ Years	CDR/LCDR	Executive Officer Afloat (9228)	Deep draft experience and Cargo Handling Officer (1215) are highly desirable.
Second Mate	6+ Years	LCDR/LT or Senior CPO	Ship's Navigator (9284) or Tug/Craftmaster	Warrant Officers or Limited Duty Officers with similar qualifications are acceptable.
Third Mate	4+ Years	LT/LT(jg) or CPO	First Lieutenant Afloat (9242) or Tug/Craftmaster	Same as Second Mate
Boatswain	6+ Years	BM1	Any BM	
Able Bodied Seaman, Unlimited	4+ Years	Second or Third Class PO	Any BM, QM, SM or OS	
Able Bodied Seaman, Limited	2+ Years	Third Class PO	Same as Able Bodied Seaman, Unlimited	
Ordinary Seaman	0 Years	Seaman (E-3/2)	Entry level rating, no skills training required	

Table 6
Merchant Marine/Navy Qualification Equivalencies for Engineering Department

Merchant Marine Billet	Sea Time	Navy Rank	Navy Qualifications (NOBC/NEC)	Remarks
Chief Engineer	10+ Years	CAPT/CDR	Ship's Engineering Officer (9369)	An Engineering Duty Officer or Limited Duty Officer with the appropriate qualifications is acceptable.
First Assistant Engineer	8+ Years	CDR/LCDR or Master Chief PO	Main Propulsion Assistant (9341) and Electronic Maintenance Officer (5977) or BT, MM, or MR	Same as Chief Engineer
Second Assistant Engineer	6+ Years	LCDR/LT or Senior Chief PO	Main Propulsion Assistant (9341) or BT, MM, or MR	Same as Chief Engineer
Third Assistant Engineer	4+ Years	LT/LT(jg) or CPO	Main Engine Officer (9384) or BT, MM, or MR	Same as Chief Engineer
Fireman/ Watertender	2+ Years	First, Second or Third Class BT	Any BT	MM or MR may be acceptable.
Oiler	2+ Years	First, Second or Third Class MM/MR	Any MM or MR	BT may be acceptable.
Electrician	2+ Years	First, Second or Third Class EM	Electrical Journeyman (4613 or 4621)	
Wiper	0 Years	Firemen (E-3/2)	Entry level rating, no skills training required	

There is no Navy qualification equivalent to the Coast Guard certification as Lifeboatman. The Lifeboatman certification, however, is embodied in the qualifications for all Deck and Engine officers and Able Bodied Seamen. Essentially, a Lifeboatman must demonstrate the ability to perform every step required to launch and recover a lifeboat from gravity davits and command a lifeboat under oars. Some classroom and hands-on training will be required for all non-certified personnel before taking the practical and written examinations for this certification.

In only one merchant marine billet, the Radio Officer, was a satisfactory Navy equivalent not found. The Navy has all but eliminated the requirement for, and

training in, morse code radiotelegraphy. Radiotelegraphy will be replaced aboard merchant ships in the future by the Global Marine Distress Safety System. However, U.S. flag merchant ships will be required, into the next century, to be able to communicate by radiotelegraphy. Further, some older ships, such as those that would be crewed by Naval Reservists, may be "grandfathered" and not required to convert to the new system at all. If there are no naval personnel qualified to operate the existing communications equipment aboard these ships, two options are available. Either option would involve additional costs to replace some or all of the existing communications suite. First, the ships could be re-equipped with a Navy communications suite suitable for their primary naval mission. This would permit the ship's communications to be operated by Navy radio operators and operate closely with fleet units without augmentation.

The second, and preferred, option would be to upgrade the existing commercial communications suite to meet the Global Marine Distress Safety System standards. Communications equipment meeting these standards permits worldwide operations with two crew members designated as radio operators. The radio operator function may be assigned as a collateral duty to any crew member trained to operate the radio equipment. The equipment meeting this standard is highly automated and computerized, requiring a minimum of additional training for deck officers already trained in radiotelephone operation. This option would also keep the ship in a position to be operated by a commercial crew, presuming that the United States amends its merchant marine communications statutes and regulations to comply with international maritime standards.

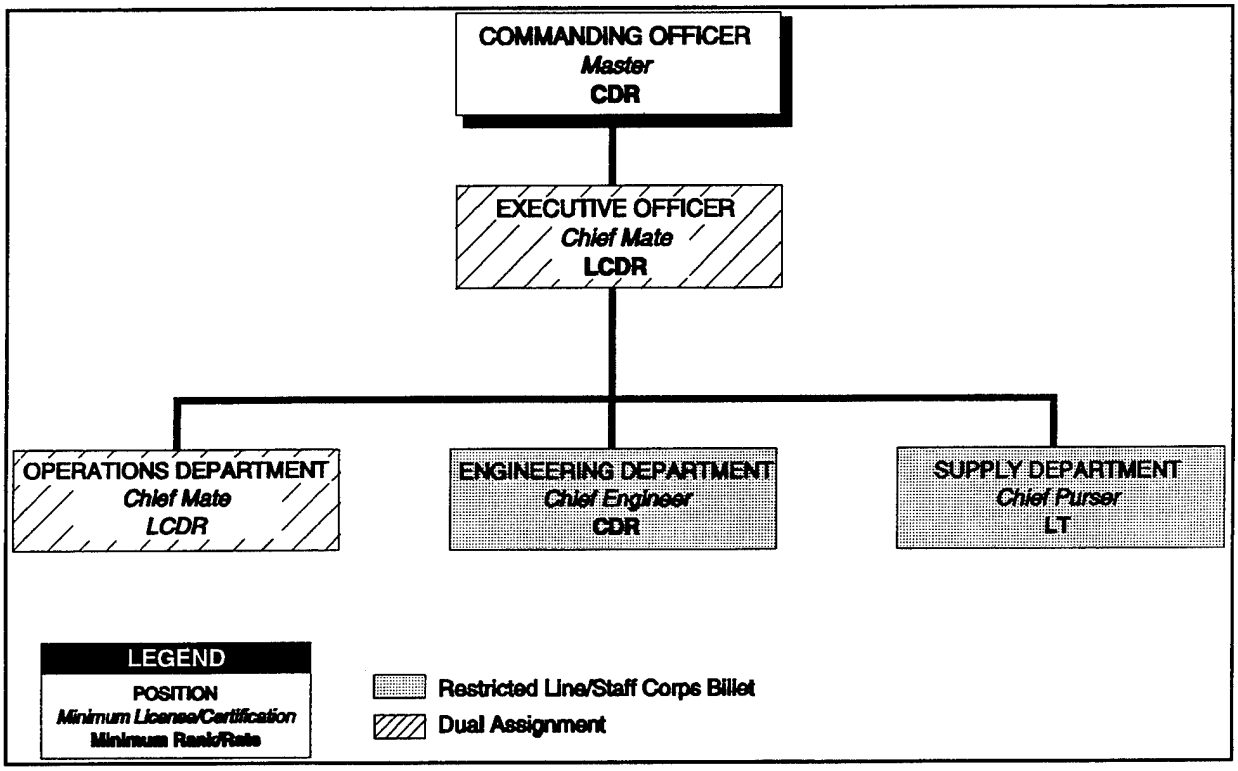
B. Ship Crew Organization

The shipboard organization in this program must meet both Navy and merchant marine requirements and accommodate their differences. First, there are the merchant marine requirements for three complete watch sections, which are set forth in the ship's Certificate of Inspection. Second, while some number of Navy regulations, instructions, procedures, customs and traditions may be waived or modified for this program, there will be an even greater number that cannot be waived or modified. These organizational, administrative and procedural requirements must be fulfilled because the ship will be a naval vessel crewed by naval personnel. This section will discuss and propose notional shipboard organizations. Although each class of ship is different and may have class-specific organizational requirements, the proposed organizations provide a sound basis for determining program personnel requirements.

(1) Departmental Organization and Responsibilities

The ship's crew would be divided functionally into three departments which essentially mirror those aboard most merchant ships: Operations (Deck), Engineering and Supply. Proposed organization charts are in Figures 15 through 18. To meet the requirements of naval organization the Chief Mate will be designated as both Executive Officer and Operations Officer. The Supply Department will be larger than would normally be found aboard a merchant ship because of the necessity to perform the naval administrative, personnel and supply functions which are not required aboard merchant ships. The Engineering and Supply Department Heads will be either Restricted Line (Engineering Department) or Staff Corps (Supply Department) and therefore not eligible for command at sea.

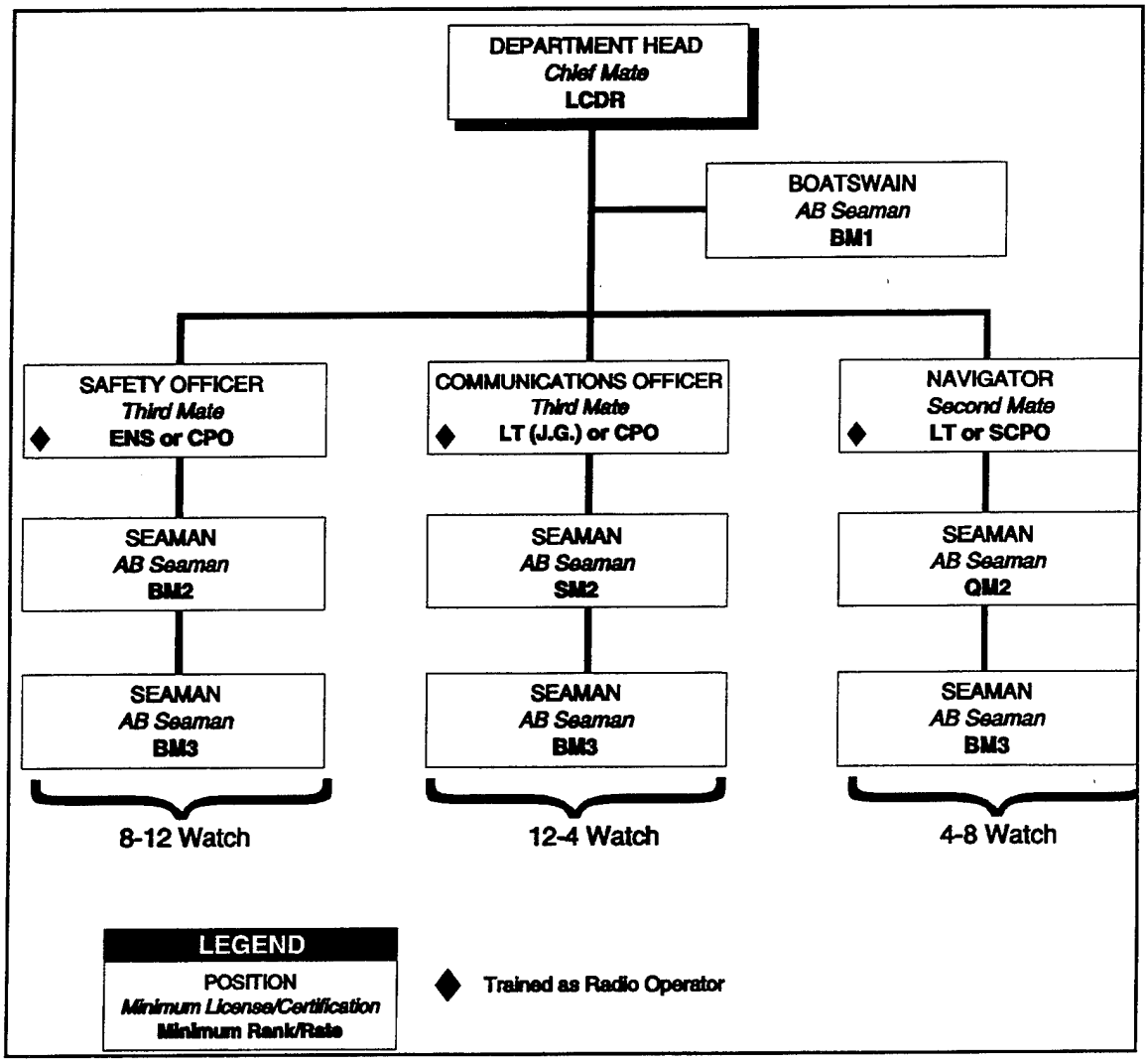
Figure 15
Proposed Departmental Organization



(2) Operations Department Organization

The Operations Department would be the functional equivalent of the Deck Department aboard a merchant ship. This department would have 4 officers and 7 enlisted personnel organized into three divisions (watches).

Figure 16
Proposed Operations Department Organization

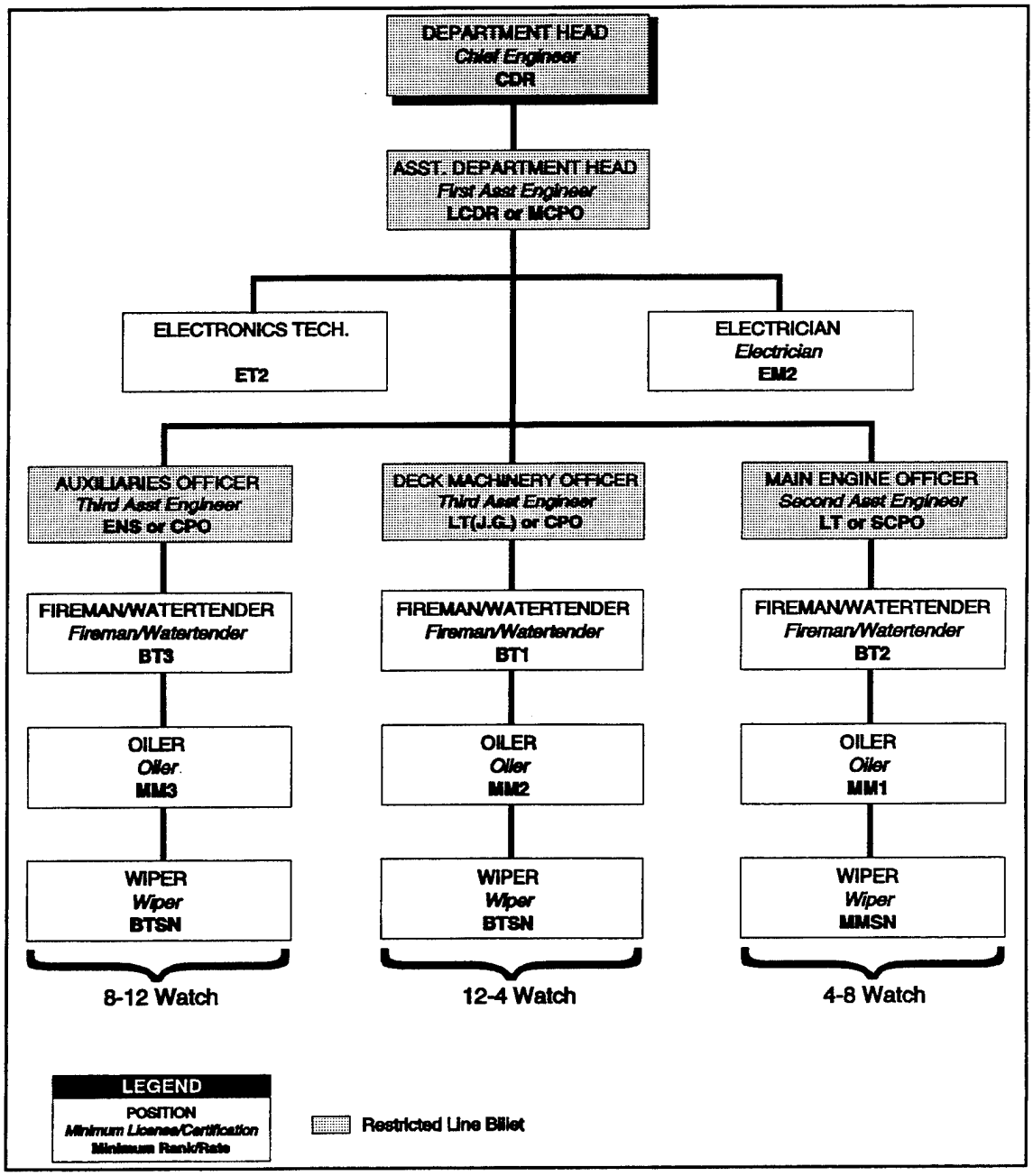


Each division would be responsible for 2 4-hour watches daily and would perform its divisional responsibilities during the other 16 hours of the day. The Operations Officer (Chief Mate) and Boatswain would be non-watchstanders to permit them to exercise their supervisory responsibilities. Additional personnel for night/restricted visibility lookout watches would be designated enlisted personnel from the Supply Department. To meet communications requirements, each Division Officer would be cross-trained as a radio operator for the Global Marine Distress Safety System.

(3) Engineering Department Organization

The Engineering Department would be the largest department aboard the ship with 5 officers and 11 enlisted personnel. Each of the three Division Officers would be, just as in the Operations Department, responsible for 2 4-hour engine room watches daily and would perform divisional responsibilities during the other 16 hours of the day.

Figure 17
Proposed Engineering Department Organization

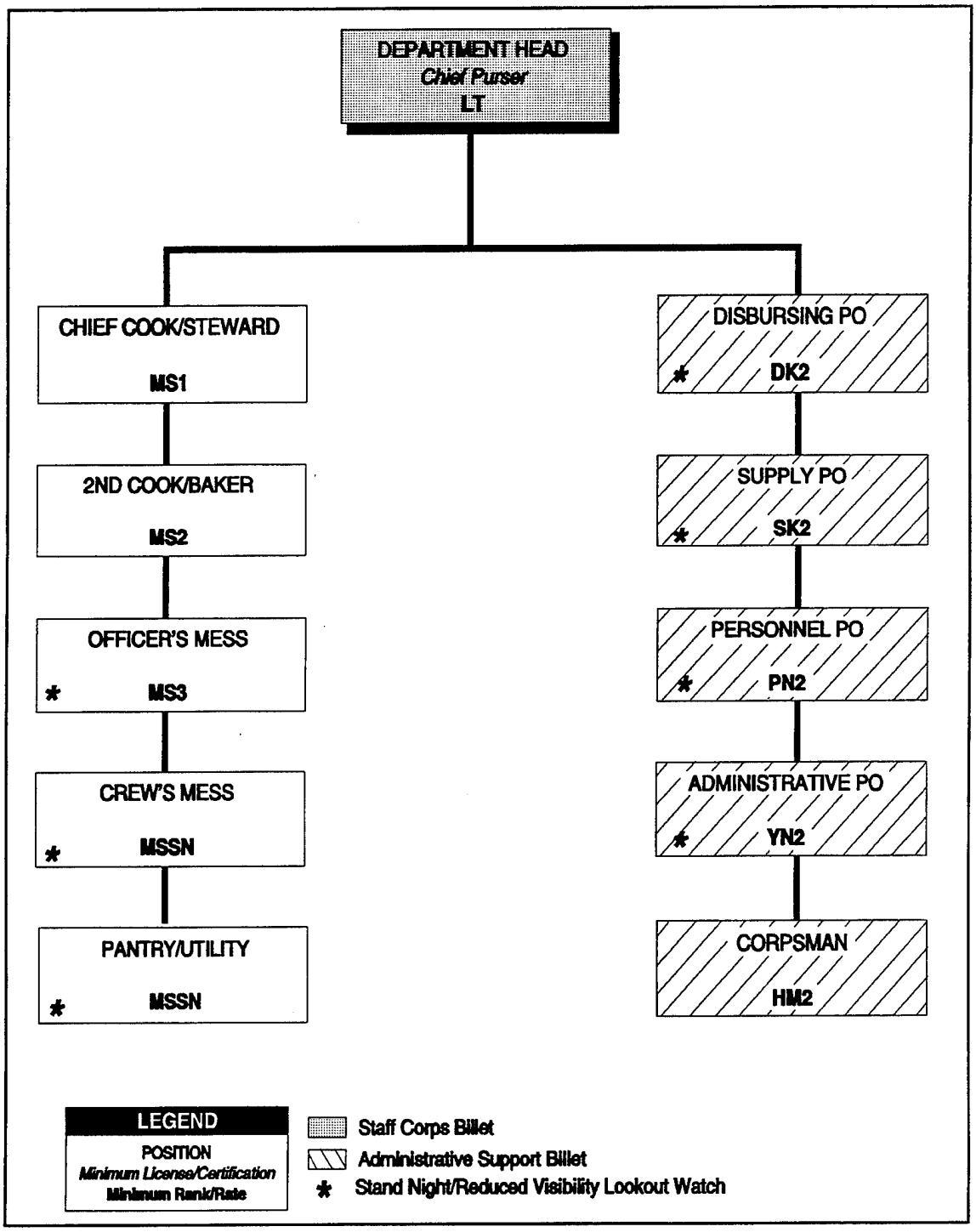


The Assistant Engineering Officer (First Assistant Engineer) would have day-to-day responsibility for repair and major maintenance of all shipboard machinery. All department personnel would be assigned to and supervised by the Assistant Engineering Officer during their off-watch working periods. Because the ship would require an electronics repair capability, the ship would be assigned an Electronics Technician in addition to an Electrician. Both would be day workers responsible to the Assistant Engineering Officer.

(4) Supply Department Organization

The Supply Department would provide hotel, supply, administrative and medical services to the other departments and ship's crew. Staffing for this department would consist of 1 officer and 10 enlisted specialists. This department is larger than that of similar merchant ships in commercial service. Commercial ships have fewer administrative functions to fulfill and these are handled as collateral duties assigned to the ship's officers, including the Master. However, because ships crewed by Naval Reservists would have to fulfill the administrative requirements of the U.S. Navy, a number of administrative specialists are assigned. Crewing strictly to merchant marine standards would not provide for full-time administrative specialists. However, merchant type ships crewed by naval personnel need not carry the same amount of administrative overhead that a naval vessel does. The essential administrative functions could be met by the small number of administrative support personnel identified above. In addition, these same personnel would be invaluable in coping with the administrative requirements of each unit's inactive duty chain of command.

Figure 18
Proposed Supply Department Organization



C. Analysis of Personnel Sources

Two sources of personnel for this program exist within the Naval Reserve. The first is the Merchant Marine Individual Ready Reserve Group. This consists of approximately 3,000 licensed merchant marine officers with commissions in the Naval Reserve. The Merchant Marine Reserve is, therefore, an immediate source of highly qualified personnel to fill licensed officer billets. The second source of personnel is those members of the Selected Naval Reserve, officer and enlisted, who have the appropriate qualifications. The demographics of each group will have a significant impact on the personnel structure of this program.

(1) Merchant Marine Individual Ready Reserve Group

The Merchant Marine Reserve is composed of approximately 3,000 officers holding merchant marine licenses, most of whom (87%) are maritime academy graduates. Details of this program's demographics are found in Appendix O. Approximately 91% of the officers in this program are junior officers in pay grades O-1, -2 or -3. Only 28% hold licenses higher than Third Mate or Third Assistant Engineer and fewer than 10% are licensed at the most senior level (Master or Chief Engineer). By contrast, on a typical merchant ship, 50-60% of the officers must hold licenses at levels above Third Mate or Third Assistant Engineer. Therefore, this program, with its very small number of officers who are senior in terms of either license or rank, is markedly bottom-heavy and very unbalanced with respect to the officer complement required aboard a merchant ship.

Because the Merchant Marine Reserve program is specifically structured to permit officers to practice their profession at sea, a significant portion (35%) of the program personnel are employed afloat. Since those persons employed afloat are part of the commercial maritime labor force that would be crewing the Ready Reserve Force, they are not considered to be available for a Ready Reserve Force contingency crewing program. Similarly, those members of the Merchant Marine Reserve who are actively employed in the maritime industry ashore (11% of the total) may be, during the early portions of a crisis, best employed in their civilian occupations. For example, recalling key members of a Ready Reserve Force ship's breakout team to crew another Ready Reserve Force ship would disrupt the breakout process at just the time when disruptions must be minimized. Therefore, between one-third and one-half of the Merchant Marine Reserve would not be available for a contingency crewing program.

Even after deducting those officers who are actively employed in the maritime industry afloat and ashore, the Merchant Marine Reserve still has a significant number of officers available for a Naval Reserve contingency crewing program. However, just as the program as a whole is bottom-heavy, so are the demographics of the Merchant Marine Reserve employed ashore in non-maritime industries. Approximately 73% of the officers with entry level licenses are

employed ashore in non-maritime occupations, whereas only 24% officers with higher licenses are similarly employed.

The number of officers with senior licenses employed ashore can also be misleading. Discussions with maritime industry operations managers, senior shipboard officers and the Merchant Marine Reserve Program Office indicate that not more than one-half of the officers who hold a particular grade of license have actually been employed at that level. For example, it is common for a person employed as First Assistant Engineer to have a Chief Engineer's license. In fact, holding a license one level higher than required for a specific billet has become, for all intents and purposes, a prerequisite for assignment to the billet. Therefore, simply possessing a license at a certain level is no guarantee that the individual will be, or even should be, employed at that level. This is similar to the situation of a naval officer having been "screened", but not selected, for command. Based on the foregoing, it is estimated that only about 30 qualified Masters and 10 qualified Chief Engineers would be available initially to take part in this program. (However, some additional officers holding Master/Chief Engineer licenses could be qualified to fill those billets as the program matures.)

(2) Selected Naval Reserve

Since the Merchant Marine Reserve has no enlisted personnel, all of the enlisted personnel for this program would have to come from the Selected Naval Reserve. The number of Selected Naval Reserve billets is to be reduced by approximately 15% to 16% in Fiscal Year 1995. A major premise of the Naval Reserve contingency crewing concept is that at least some of these persons, and billets, can be "recycled" into this program. Therefore, for purposes of this analysis, the number of Selected Naval Reserve personnel who could be available for this program will be assumed to be equal to 16% of the total number of those with the necessary qualifications in the Selected Naval Reserve.

One particular concern about the continued availability of skilled enlisted personnel for this program is that the Navy is replacing steam powered ships with ships propelled by diesel engines or gas turbines. This will increase the potential flow of steam engineers into the Naval Reserve from active duty in the short term, but will significantly reduce the flow in the long term. The approximate number of Naval Reserve personnel with the closest equivalencies to merchant marine qualifications who could be available to fill billets in this program are shown in Table 7. The figures in Table 7 are based on the programmed Fiscal Year 1995 billet reductions, personnel qualifications and the availability of Merchant Marine Reserve officers based on the previous discussion.

D. Personnel Shortfall Analysis

The basis for determining the Naval Reserve program personnel requirement is the proposed ship crew organization for three different notional program sizes of 10, 20 and 30 Ready Reserve Force ships. Some reductions in the personnel requirement could be achieved. Elimination of the Fireman/Watertender (due to automated boiler combustion controls) and Wiper billets along with the Disbursing Petty Officer and Supply Petty Officer billets could reduce crew size from 39 to 31 persons. Placing the Chief Mate and First Assistant Engineer on a watchstanding status would permit the elimination of two junior officers (one deck and one engine) for a further reduction to 29. These reductions would align the proposed billet structure with current merchant marine crewing scales. Both the full crew and reduced crew organizations were analyzed.

The base crewing requirement for each program size and option was increased by 25% to provide for training and attrition. Even where there are estimated to be more qualified personnel than the program requirement (a surplus), the size of the surplus may not allow for candidates who either are found to be unsuitable or cannot, for whatever reason, participate in the program. A 100% surplus would provide 2 potential candidates for each billet. This is consistent with Navy practice for filling commanding officer billets. However, with more candidates available there would be a higher degree of confidence that key positions could be filled with the most qualified candidates. The results of these analyses are shown in Table 7.

Elimination of the Fireman/Watertender billet not only eliminates a marginal surplus (less than 100%) in this billet at the 30-ship program level, but increases the Oiler surplus as Boiler Technicians, no longer required to fill Fireman/Watertender billets, can become Oilers. By eliminating the Disbursing Petty Officer billet, a hard-to-fill billet at the 20-and 30-ship program level is also eliminated. Both the disbursing and supply functions could be performed by the Supply Officer supported by the other petty officers. The Pantry/Utility billet could be filled by a Mess Management Specialist Third Class.

The Third Mate and Third Assistant Engineer billets have the largest officer surpluses. Reducing these billets from 2 per ship to 1 per ship had an inconsequential impact on the size of the surpluses. The significant impact of these reductions and the reductions in unlicensed Engineering Department personnel is that greater reliance would be placed on the senior officers to perform routine maintenance tasks that otherwise would be assigned to junior officers or unlicensed personnel. The maintenance issue could be resolved by using teams of skilled deck and engine personnel temporarily assigned for this purpose or by retaining the additional Third Mates/Third Assistant Engineers.

Table 7 (1)

Personnel Availability, Crewing Requirements and Shortfall Analysis

Merchant Marine Billet	Qualified Selected Reservists	Available Selected Reservists	Available Merchant Marine Reservists	Total Naval Reserve Personnel Available	10 Ship (F/C) Program Requirement	Surplus or Shortfall (-)	10 Ship (R/C) Program Requirement
Master	10	2	31	33	13	154%	13
Chief Mate	57	9	64	73	13	462%	13
Second Mate	566	91	50	141	13	985%	13
Third Mate	1251	200	669	869	25	3376%	13
Boatswain	983	157	0	157	13	1108%	13
Able Bodied Seaman	8759	1401	0	1401	75	1768%	63
Total Deck Officers	1884	302	814	1116	64		52
Total Deck Unlicensed	9742	1558	0	1558	88		76
Chief Engineer	0	0	10	10	13	-23%	13
First Assistant	78	12	29	41	13	215%	13
Second Assistant	220	35	34	69	13	431%	13
Third Assistant	497	80	926	1006	25	3924%	13
Electrician	1993	319	0	319	13	2354%	13
Electronics Technician	1915	306	0	306	13	2254%	13
Fireman/Watertender	1260	202	0	202	38	432%	0
Oiler	4325	692	0	692	38	1721%	38
Wiper	1483	237	0	237	38	524%	0
Total Engine Officers	795	127	999	1126	64		52
Total Engine Unlicensed	10976	1756	0	1756	140		64
Chief Purser	1453	232	0	232	13	1685%	13
Chief Steward/Cook	1664	266	0	266	13	1946%	13
Second Cook/Baker	3689	590	0	590	13	4438%	13
Pantry/Utility	535	86	0	86	38	126%	38
Disbursing PO	272	44	0	44	13	238%	0
Supply PO	3962	634	0	634	13	4777%	0
Personnel PO	717	115	0	115	13	785%	13
Administrative PO	2583	413	0	413	13	3077%	13
Corpsman	5387	862	0	862	13	6531%	13
Total Supply Officers	1453	232	0	232	13		13
Total Supply Unlicensed	18809	3010	0	3010	129		103
Total Officers	4132	661	1813	2474	141		117
Total Unlicensed	39527	6324	0	6324	357		243

(2)

or	10 Ship (R/C) Program Requirement	Surplus or Shortfall (-)	20 Ship (F/C) Program Requirement	Surplus or Shortfall (-)	20 Ship (R/C) Program Requirement	Surplus or Shortfall (-)	30 Ship (F/C) Program Requirement	Surplus or Shortfall (-)	30 Ship (R/C) Program Requirement	Surplus or Shortfall (-)
%	13	154%	25	32%	25	32%	38	-13%	38	-13%
%	13	462%	25	192%	25	192%	38	92%	38	92%
%	13	985%	25	464%	25	464%	38	271%	38	271%
%	13	6585%	50	1638%	25	3376%	75	1059%	38	2187%
%	13	1108%	25	528%	25	528%	38	313%	38	313%
%	63	2124%	150	834%	125	1021%	225	523%	188	645%
	52		125		100		189		152	
	76		175		150		263		226	
%	13	-23%	25	-60%	25	-60%	38	-74%	38	-74%
%	13	215%	25	64%	25	64%	38	8%	38	8%
%	13	431%	25	176%	25	176%	38	82%	38	82%
%	13	7638%	50	1912%	25	3924%	75	1241%	38	2547%
%	13	2354%	25	1176%	25	1176%	38	739%	38	739%
%	13	2254%	25	1124%	25	1124%	38	705%	38	705%
%	0	0%	75	169%	0	0%	113	79%	0	0%
%	38	2253%	75	823%	75	1092%	113	512%	113	691%
%	0	0%	75	216%	0	0%	113	110%	0	0%
	52		125		100		189		152	
	64		275		125		415		189	
%	13	1685%	25	828%	25	828%	38	511%	38	511%
%	13	1946%	25	964%	25	964%	38	600%	38	600%
%	13	4438%	25	2260%	25	2260%	38	1453%	38	1453%
%	38	126%	75	15%	75	15%	113	-24%	113	-24%
%	0	0%	25	76%	0	0%	38	16%	0	0%
%	0	0%	25	2436%	0	0%	38	1568%	0	0%
%	13	785%	25	360%	25	360%	38	203%	38	203%
%	13	3077%	25	1552%	25	1552%	38	987%	38	987%
%	13	6531%	25	3348%	25	3348%	38	2168%	38	2168%
	13		25		25		38		38	
	103		250		200		379		303	
	117		275		225		416		342	
	243		700		475		1057		718	

Shortfalls or marginal surpluses in which there would be fewer than two candidates, on the average, for each position occur in every senior licensed billet (Master, Chief Engineer, Chief Mate and First Assistant Engineer) and the Second Assistant Engineer billet at the 30-ship program level. With a 20-ship program, there would not be sufficient Masters, Chief Engineers and First Assistant Engineers. At the 10-ship program level a shortfall of Chief Engineers exists irrespective of whether the full or reduced crew option is considered.

Additional candidates for Second Assistant Engineer billets could be Third Assistant Engineers with some amount of at-sea experience. However, selecting such a candidate would put an additional burden on the senior engineering officers since either all (full crew option) or two-thirds (reduced crew option) of the engine room watchstanding officers would have less than 1 year of experience. The better solution would be to recruit and train additional experienced personnel for this billet before promoting relatively inexperienced Third Assistant Engineers.

The senior officer billets demand officers with significant levels of at-sea experience. No amount of education, simulator training or shoreside experience can substitute for this level of experience. For example, the Military Sealift Command's minimum requirements for promotion of a mariner to Master or Chief Engineer are holding the appropriate Coast Guard license and being employed at least 1 year in permanent status by the Military Sealift Command at the next lower level of responsibility. Each Master/Chief Engineer Promotion Board is instructed that ". . . supervisory and managerial potential should be evidenced by sustained successful performance as First Officer/First Assistant Engineer responsible for managing department operations and personnel."

Given the importance attached to successful performance as First Officer/First Assistant Engineer in determining suitability for promotion, the process to fill these positions is less formal but only slightly less demanding. These same standards should apply to a Naval Reserve contingency crewing program.[1]

E. Recruiting

To make this program successful enough candidates for each billet should be identified and interviewed so that the only the best available personnel are selected. First, an adequate number of junior enlisted personnel (pay grade E-6 and below) must be identified and screened for assignment to appropriate unlicensed billets. Second, and more important, sufficient qualified personnel must be identified and screened to fill the management and leadership billets. Not all qualified candidates, even those with experience as Masters or Chief Engineers, will meet the unique operational requirements of a Naval Reserve contingency crewing program. This analysis assumes that there must be at least 2 qualified

[1]Maritime industry standards for selection of senior officers are essentially the same.

individuals from whom to fill the position.

Based on the shortfall analysis contained in Table 7, recruiting goals to fill shortfalls or increase marginal surpluses of these key personnel could present significant challenges. For example, a 30-ship program would require the Naval Reserve to identify approximately 70 qualified Chief Engineers and 40 qualified Masters who would be willing to participate in the program if they were selected to fill one of the program billets.

(1) Recruiting for Unlicensed Billets

The only potential challenges to filling unlicensed billets are in the Fireman/ Watertender, Oiler and Disbursing Petty Officer billets. No reliable data is currently available on the effect of the fleet drawdown on the enlisted communities which would be the recruiting sources for these billets. However, the Chief of Naval Reserve has indicated in the most recent Enlisted Career Management Objectives list that there is a surplus of personnel in every rating that would be expected to be involved in this program. That being the case, there should be little difficulty in recruiting sufficient enlisted personnel.

(2) Recruiting for Licensed Billets

Alleviating the shortfalls and increasing marginal surpluses in the senior licensed officer billets will be neither simple nor easy. Command at sea is the pinnacle of many naval officers' and merchant marine officers' careers. It is achieved only after a very careful selection and qualification process taking many years. Even those officers whose qualifications meet the published standards may not be selected for command. Those who are capable, qualified and selected to fill these billets are relatively rare. They are even rarer in the Selected Naval Reserve because very few officers above the rank of Lieutenant leave active duty and affiliate with the Naval Reserve. The officers affiliating with the Selected Naval Reserve have, in general, been neither Executive Officers nor Commanding Officers of any type of oceangoing vessel, let alone a deep-draft command similar in size to a Ready Reserve Force ship. Few have even been shipboard Department Heads.

If enough qualified persons for these command level billets do not exist in the Selected Naval Reserve, more must be recruited. There are essentially two sources. First, there are those licensed and qualified persons who are working ashore and are not presently or never have been naval officers. Second, there are recently retired naval officers with the necessary background.

Recruiting senior merchant marine officers presents two significant challenges. The first is that the Merchant Marine Reserve program no longer has the administrative authority to appoint merchant marine officers to commissioned grades higher than Ensign. The Merchant Marine Reserve program did appoint senior merchant marine

officers as Commanders and Captains in the early years of the program. Difficulties involved when making "instant" senior naval officers and lack of interest led to discontinuing this practice. However, under 10 USC 594, the Secretary of the Navy may still make appointments to commissioned grades in the Naval Reserve up to Lieutenant Commander. Further, the Secretary may also make appointments to commissioned grades higher than Lieutenant Commander for former commissioned officers of any armed force or upon the recommendation of a board of officers convened for that purpose. Appointments to commissioned grades higher than Lieutenant Commander require the Senate approval.

Without the ability to appoint senior merchant marine officers to commissioned grades commensurate with their qualifications and experience, it will be difficult to recruit them. There would be little incentive for qualified merchant marine Masters or Chief Engineers to participate in a Naval Reserve contingency crewing program unless commissioned at grades appropriate to their license and experience. An obvious and additional problem is that if a senior merchant marine officer were commissioned as a junior officer, the situation would quickly arise of the junior officer being placed in command of officers who are senior in grade. Therefore, to recruit the most qualified personnel, the Merchant Marine Reserve should be permitted to appoint senior merchant marine officers to commissioned grades commensurate with their experience and qualifications.

The second challenge is similar. Merchant marine pay is, in general, significantly higher than that for naval personnel of similar rank and experience. For example, the annual salary differential between a Master and a U.S. Navy Commander of equivalent seniority is over $24,000. Even though the target recruiting audience for a Naval Reserve crewing program may not be receiving seagoing wages, this is the same group that commercial shipping companies and/or labor organizations would recruit from in a crisis. Given that individuals are willing to volunteer to crew a Ready Reserve Force ship in a crisis to begin with, why would they be willing to receive $24,000 less for doing the same job and taking the same risks? An effective recruiting program must answer this question and persuade enough individuals that a limited number of advantages such as drill pay will counter-balance the inherent financial disincentives of this program.

If sufficient numbers of senior merchant marine officers cannot be recruited into the Selected Naval Reserve, another option would be to recruit recently retired naval officers or senior enlisted personnel. One method of involving Navy retirees in this program would be to use the authority granted the Secretary of the Navy (10 USC 6485(b)) to recall to active duty for training members of the Retired Reserve or Fleet Reserve. This authority may only be used when it is in the national interest and no other qualified reserve personnel are available. Active duty training is limited to a total of 2 months in any 4 year period. Fleet Reservists may only be involuntarily recalled for operational reasons during Partial Mobilization. Members of the Retired Reserve may only be involuntarily recalled upon Full

Mobilization. However, this authority has been used successfully in the Naval Reserve Convoy Commodore program, and there has been a consistently high level of interest in voluntary recalls by the members of this program.

The second method would be to recruit retirees with the appropriate qualifications into the Selected Reserve. This would be a significant recruiting challenge. Retired personnel would receive little, if any, financial benefit from affiliating with the Selected Reserve since drill or active duty pay received from the Selected Reserve would be deducted from their retirement payments. Further, they would be in a Selected Reserve status and subject to Selected Reserve recall authorities rather than the more restrictive recall authorities applicable to retired personnel. While most retirees begin second careers upon retirement from the Navy, it is possible that some of them would be interested in this program on a patriotic basis.

Finally, if sufficient retired naval personnel cannot be recruited, active duty personnel with the appropriate background and experience assigned to shore billets could be made available. These officers or senior enlisted personnel would be trained and assigned to contingency billets as senior licensed officers aboard these ships. This would be similar to the procedure used to staff the Medical Treatment Facility aboard the Hospital Ships with active duty medical personnel from nearby naval hospitals. Such an arrangement could be attractive to active duty officers who have screened for command or department head billets and are assigned to shore duty. However, using active duty officers would have a tendency to "disconnect" the officers filling leadership billets from the rest of the crew. In addition, it is unlikely that active duty officers, with full-time assignments, would be able to spend the amount of time necessary to become fully familiar with the specific ship or ship class that they would be expected to serve aboard. This would tend to weaken the overall level of crew readiness and training.

In summary, each potential recruiting solution to the lack of qualified senior officers in the Naval Reserve poses significant challenges. The best solution would be to recruit senior merchant marine officers and appoint them to commissioned grades commensurate with their qualifications and experience. However, this is not possible under current policy. Recruiting retired naval personnel into the Selected Reserve or assigning active duty personnel, each has its own unique challenges. However, since active duty personnel can be assigned to contingency billets rather than having to be recruited, this could be the ultimate, although less than optimal, solution to filling senior licensed officer billets.

F. Training Program

Training for a Naval Reserve contingency crewing program would require three distinct types and phases of training. The first would be assignment to a training unit to begin qualification training for assignment to a ship unit. The second would be weekend training aboard a designated ship or other training site. The third

would be 2 weeks underway training each year.

(1) Qualification Training

Qualification training would be required for those personnel who do not possess a Coast Guard license or certification for the billet they will be assigned to. This training would, most likely, be conducted at the campus of one or more of the nation's maritime academies by academy instructors using a specially developed curriculum for transitioning naval personnel to merchant marine billets. A maritime academy would be the most efficient site for this training since the maritime academies have facilities for both licensed and unlicensed training in both the deck and engine departments on the same campus. Separate industry training facilities for licensed and unlicensed deck and engine department skills exist throughout the country and could also be used.

Two types of qualification courses would initially be offered. One course would be for officers and senior enlisted personnel seeking to qualify for licensed officer billets in either the deck or engineering departments. The second would be for enlisted personnel qualifying for skilled unlicensed deck and engineering billets. There is no specific Coast Guard qualification requirement for steward's department billets.

The licensed officer qualification course would run for 30 continuous days on a 6-day-per-week, 8-hour-per-day basis for approximately the first 3 weeks. After-hours tutoring would be available. The final week of the course would be used to take a slightly modified Coast Guard examination for the billet level that each individual is qualifying for. The modifications to the examination would be the elimination of those areas dealing with the commercial aspects of ship's business and personnel administration.

Unlicensed qualification courses would be similar in all respects to the licensed officer qualification courses. The differences would be in length, 15 versus 30 days, technical depth of instruction and duration of the Coast Guard examination. The unlicensed courses logically should be scheduled at the same site and time as the licensed officer courses in order to provide unlicensed watchstanders for simulator platforms. Simultaneous scheduling would reduce costs and introduce program personnel to each other.

Prior to arriving at the qualification training site every individual would be provided with initial training resources so that each course could start at an established common level. Individuals who fail the qualification examination would be given an opportunity to re-test those portions of the examination they failed (not more than two sections for licensed officer examinations) 30 days following the first examination. The second examination would be done without additional cost to the Government. Failure to pass the qualification examination would result in

immediate reassignment to other appropriate billets.

(2) Weekend Training

One unique aspect of this program is that all members of each ship's crew would be intimately familiar with that ship or a sister ship before reporting aboard to activate it. This can be accomplished only by spending time aboard the ship. Therefore, rather than training in classrooms at a Naval Reserve Readiness Center, each ship's crew, and those qualified persons awaiting assignment to a ship's crew, would train aboard either their vessel or a sister ship for one weekend during 2 of the 3 months of each quarter. The other weekend of each quarter would be spent at appropriate bridge/engine room simulator training facilities.

An essential element of this program, and therefore its training program, is familiarity with specific systems aboard each unit's assigned ship. Training aboard a ship unlike the one which a specific unit will be expected to operate would defeat the entire purpose of developing familiarity with ship systems and a sense of "ownership" in their ship by each reserve unit.

Between 3 and 8 ships, depending on program size would be the absolute minimum number of weekend training sites for this program, given the Ready Reserve Force detailed in Appendix D. See the example in Table 8 below. Based on the actual types and classes of ships selected, the number of weekend training sites required could be higher. While using the absolute mathematical minimum of weekend training sites would reduce program costs somewhat, it would also provide less effective training. This is because mariners would train on ships of a different type/class from the ship they would operate in a crisis or contingency.

Table 8
Minimum Weekend Training Site Requirements

Program Size	Ship Classes	Training Sites
10 Ships	4-Cape "A", 4-Cape "B", 2-Cape "J"	3
20 Ships	4-Cape "A", 4-Cape "B", 4-Cape "F", 4-Cape "J", 4-TACS (Haglunds Cranes)	5
30 Ships	4-Cape "A", 4-Cape "B", 4-Cape "F", 2-Cape "G", 4-Cape "J", 3-Cape "M", 6-TACS (Hagglunds Cranes), 3-TACS (Lake Shore Cranes)	8

Training aboard ship would utilize a variety of methods. While most shipboard machinery and systems will not be operable, enough systems must be operable to support the habitability and sanitary needs of the reservists training on board. Operating and monitoring these systems during the weekend aboard would be the responsibility of the appropriate unit personnel, under the supervision of the ship manager. Other non-operational systems would be the subject of a structured training program involving hands-on system familiarization, instructional video tapes for specific systems and simulations of these procedures on the cold system. Meals during weekend training would be prepared by the crew in the ship's galley. Further, reservists could perform minor routine maintenance under the supervision of the ship manager.

(3) Annual Training

Annual training would be the ultimate test of this program and its people -- and an effective recruiting draw. During annual training all members of each ship's crew would be required to establish their continuing qualification for their billets at sea aboard an operational ship. To accomplish this, 1 or 2 of the ships test activated each year would be kept operational for up to one full year as training platforms. The ship manager would provide a skeleton crew of senior licensed officers and unlicensed personnel to act as evaluators and instructors. At the end of the 2-week period they would render an opinion as to whether or not the ship's crew was ready to operate an oceangoing vessel and, if not, what actions would have to be taken to re-qualify.

The training cycle would begin with a detailed shipboard briefing on specific procedures and systems unique to that ship, including detailed activation procedures. This would be followed by hands-on familiarization with the systems and activation procedures by all personnel. When the ship manager was confident that the crew was ready, and the ship's systems fully activated, the ship would begin a 24 hour dock trial. During that period, the ship would be independent of all shore support. All ship systems would be test operated under controlled conditions and emergency drills conducted. Following successful completion of the dock trial the ship would proceed to sea for all but the last two days the active duty training period. Upon securing at the ship's berth, the crew would perform or demonstrate, as appropriate, proper deactivation procedures.

Following successful deactivation, the evaluators would debrief the ship's crew on its performance during the training period. Specifically, the evaluators would critique individual, team, and crew performance and render an opinion, based on a weighted evaluation, as to whether or not the ship's crew was ready to operate an oceangoing ship without outside supervision. Based on these recommendations, the ship's crew would be assigned one of the training readiness status codes shown in Table 9. Corrective actions taken before the next annual training period could upgrade the training readiness status.

Table 9
Training Readiness Categories

Category	*Definition*
A	*Fully qualified, no remedial action required.*
B	*Marginally qualified, replacement or remedial training required for some junior licensed officers or skilled unlicensed personnel.*
C	*Unqualified, replacement or remedial training required for the majority of junior skilled personnel or one or two senior licensed officers.*
D	*Unqualified, recommend replacement of three or more senior licensed officers or majority of junior skilled personnel.*

Chapter 8
Pilot Program

The pilot program would mirror the proposed annual training cycle and program structure with a few significant differences. First, to avoid the legal and organizational challenges involved in using a Ready Reserve Force ship, a merchant type ship owned by the Navy would be used. Second, the crew would be hand picked and assigned to a test unit. Third, the pilot program would be temporarily created and organized according to a provisional Chief of Naval Operations instruction providing relief from a number of Naval Regulations and Instructions for the duration of the pilot program. Finally, the pilot program would take place over a 12- to 18-month period rather than the 1-year cycle within which the mature program would function.

The longer period is required for two reasons. First, there will be a finite amount of time required to establish the unit billets in the Naval Reserve personnel system, select the unit personnel and assign them to the unit, establish draft training plans, develop training materials, contract for inactive ship management, activate the demonstration ship, and temporarily establish the unit. Second, the enlisted personnel selected to fill the skilled unlicensed billets will need to have one active duty training period to attain their initial qualifications prior to ship-specific training and the shipboard annual training period. Reservists cannot perform more than one active duty training period per calendar year unless additional training funds are available and unless the reservists volunteer for additional training duty.

A. Pilot Program Ship

The only inactive merchant type ship currently titled to the Department of the Navy that could be reactivated for the pilot program is the USNS RIGEL. Any other ship suitable for this demonstration is either not in a condition to be reactivated, titled to the Department of Transportation, or would disrupt an ongoing program such as the Aviation Logistics Support Ships. The RIGEL is a C3 type steam propelled dry cargo ship built in 1955. It was acquired by the Navy and converted to a Fleet Stores ship in 1958, transferred to the Military Sealift Command in 1975 and laid up in 1993 at the James River Reserve Fleet. The ship systems, particularly the main engine and auxiliary systems, will require completion of all outstanding maintenance and repair items. The ship must then be re-certified by the Coast Guard before it can be safely operated or used as a training platform. Contracting for repairs, re-certifications, inactive ship management and activation would need to commence immediately upon the decision to proceed with the pilot program. Pilot program costs are discussed in the next chapter.

B. Lessons Learned

The large number of lessons learned during the pilot program must be collected and disseminated for interpretation and action by the appropriate agencies and offices. The effects of the lessons learned will range from overall program feasibility to very specific suggestions on improving program elements. By far the most important lesson learned will be the determination, at the end of the pilot program, of how ready the ship's crew was to assume responsibility for operating the ship.

One specific organization must be tasked with the overall responsibility for the lessons learned program. The Merchant Marine Reserve Operational Command Headquarters unit located in Washington, D.C., would be an appropriate organization to be assigned this mission. Another organization which may have the capability to collect and analyze the lessons learned from the pilot program would be the Center for Naval Analyses. In all probability the Merchant Marine Reserve unit would need to commit a number of personnel for annual training immediately prior to, during and immediately after the pilot program's annual training/underway trial period. This is the period in which the majority of the lessons learned will be collected. Following the collection of the lessons learned, the information will be published for interpretation and decision making on how the overall program should be shaped. In case the program is approved for implementation, it is important that the decision on whether to proceed with the full program be made in sufficient time to avoid dissolution of the ship's crew and loss of experience gained during the pilot program.

Chapter 9
Program Costs

Two methods of cost analysis could be used. The first is based on the increases in appropriations required for a single Government agency to implement a program. The second method considers only those program costs that are not already funded by any government agency. The second method has been selected for use in this study since it is the method used by the Office of Management and Budget for analyses which compare program alternatives. It also more accurately reflects the ultimate cost to the taxpayer.

Using this approach, the operations and maintenance costs of Ready Reserve Force ships assigned to the Naval Reserve are not considered to be part of the total program cost. That is because this significant annual cost (over $1.5 million per ship) would be incurred by the Government whether the ships had been assigned to the Naval Reserve or remained under Maritime Administration custody.

The costs for a Naval Reserve contingency crewing concept are based on two notional crewing options: a crew of 11 officers and 28 enlisted personnel (full crew option) and 9 officers and 20 enlisted personnel (reduced crew option). The specific make-up of these crews was detailed earlier in Chapter 7 and program personnel requirements, in Table 7. Program costs for each crew size option were developed for three program sizes to be funded by the Navy: 10 ships, 20 ships and 30 ships. The annual cost to the Navy for this contingency crewing concept ranges between $9.7 million (10 ships/reduced crew) and $26.1 million (30 ships/full crew). The per-reservist cost ranges between $27,077 (10 ships/reduced crew) and $17,725 (30 ships/full crew). Detailed costs (in constant Fiscal Year 1995 dollars) for each of the possible program sizes are contained in Table 10, at the end of this chapter.

A. Personnel

The Commander, Naval Surface Reserve Force estimates, for budgeting purposes, that the average Fiscal Year 1994 annual program cost to the Naval Reserve for a reserve officer is $11,185. An enlisted reservist has a program cost of approximately $4,307 per year. The same costs for full time support personnel, although no additional full time support personnel are believed to be required to support this program, are $80,627 per year for officers and $34,776 per year for enlisted personnel. The minimum annual personnel cost for this program would be about $2.4 million for the smallest program size (10 ships/reduced crew). The maximum personnel cost would be about $9.2 million for the largest program (30 ships/full crew).

B. Afloat Training

Afloat training costs are those costs directly related to operating, for the majority of each year, 1 or more of the ships scheduled each year for test activation. The expected operating tempo for the afloat training ships would vary between 20 and 40 weeks of underway training per year, depending on program size. At maximum operating tempo this would still allow about 4 weeks for ship activation, 4 weeks for its deactivation and 4 weeks for maintenance/crew downtime. The ship operating costs, exclusive of fuel, were estimated to equal that of a ship in Reduced Operating Status or $1.8 million per year in addition to the base maintenance cost. Fuel costs for training operations are estimated to be $2.0 million per ship, per year, at maximum operating tempo. Therefore, the total annual cost of providing underway training platforms would range from $1.9 million for a 10 ship program (1 ship for about 1/2 year) to approximately $5.1 million for a 30 ship program (2 ships for about 2/3 year each).

C. Shore Based Training

There are three basic cost components to shore based training for this program. The first is the cost of maintaining a sufficient number of ships to serve as weekend training platforms for the ship crew units. Second is the funding required for the licensed and unlicensed qualification programs. Finally, there is the cost of quarterly deck and engine simulator training for each ship crew.

(1) Weekend Training Ships

To provide an effective weekend training site, each ship designated for that function must have all of its "hotel" auxiliary systems either operating or replaced by shore systems. The essential systems are the heating, ventilation, air conditioning, electrical, sanitary and potable water. These systems cannot be simply connected or turned on for each weekend and disconnected or turned off during the week. Operating any but the most rudimentary ship systems places the ship effectively in a Reduced Operating Status. The cost differential between a "cold" status ship and a "warm" ship which could be used as a weekend training ship is approximately $1.0 million per year. This amount would be directly attributable to training costs.

(2) Qualification Training Programs

The qualification programs would cost between $75,000 (deck officer) and $5,000 (engineering unlicensed) per course according to figures obtained for similar courses taught at maritime academies and other maritime training institutions. The 30-day officer program costs include the cost for 15 additional days of active duty required to supplement the standard 15 days of annual training. These costs do not include travel, lodging or meals which are included in the Naval Reserve

personnel cost estimates for both officers and enlisted personnel. For planning purposes it was assumed that a qualification training program would be offered at least once each year for every 10 ships in the program.

(3) Quarterly Simulator Training

Quarterly simulator training is expected to cost approximately $8,000 per weekend for the deck and engineering departments at a fully equipped maritime simulator facility. Members of the Supply Department would receive rate training either at the simulator training site or at a nearby Naval Reserve Readiness Center. As with the costs for the qualification training programs, the simulator training cost does not include those costs which are part of the Naval Reserve personnel cost estimates.

D. One-Time Program Costs

There are two distinct categories of one-time costs. The first is the cost of the pilot program discussed in Chapter 8. These costs will be incurred by the Navy whether or not the program is implemented beyond the pilot program. If the program is implemented after the pilot program, additional start-up costs will be incurred. For the calculation of total program cost both of these essentially fixed costs have been amortized over an arbitrarily selected 5 year period. The one-time costs total between $9.9 million and $11.7 million depending on program size. These figures amortize over 5 years to between $1.9 million and $2.3 million. The pilot program cost figure assumes the lowest cost (reduced crew) option.

(1) Pilot Program

The pilot program contains nearly every element discussed in the sections above as well as some of the overall program fixed costs. Details are shown in Table 10.

Table 10
Pilot Program Costs

Activation/Maintenance/Contracting	*$4,000,000*
Drill Site	*1,000,000*
Officers (9)	*1,811,970*
Enlisted (20)	*1,550,520*
Enlisted Qualification Training	*23,700*
Quarterly Simulator Training	*48,000*
Training/Manpower Documents	*61,500*
School Curriculum Development	*12,000*
Training Materials	*112,500*
Miscellaneous Program Costs	*$750,000*
Total Pilot Program Cost	***$9,370,190***

(2) Initial Fixed Costs

Other than the cost of the pilot program, the development of relevant training materials for the ship crews is the largest identifiable cost. These costs are detailed in Table 11. The basis for determining these costs was that, for a 10 ship program, at least 2 separate ship classes would be involved; for a 20 ship program, 5 ship classes would be involved; and in a 30 ship program, as many as 8 classes could be involved. Each class would require a unique set of training materials, Navy manpower documentation and Navy training plans. Costs were assumed to be reduced through commonality of some basic ship systems, billet structures and required training. However, each ship class and, in some cases, each ship would have unique equipment for which each document would have to account in some fashion.

Table 11

Annual Cost Estimate for Naval Reserve Contingency Crewing Program

	10 Ships/Full Crew	10 Ships/Reduced Crew	20
PERSONNEL			
Officers	$1,577,085.00	$1,308,645.00	
Enlisted/Unlicensed	$1,537,599.00	$1,046,601.00	
(a) Total Ship Crew Cost	$3,114,684.00	$2,355,246.00	
AFLOAT TRAINING			
Operations	$900,000.00	$900,000.00	
Fuel	$1,000,000.00	$1,000,000.00	
(b) Total Training Ship Cost	$1,900,000.00	$1,900,000.00	
SHORE BASED TRAINING			
Drill Sites	$3,000,000.00	$3,000,000.00	
Deck Officer Courses	$74,700.00	$74,700.00	
Deck Unlicensed Courses	$27,600.00	$27,600.00	
Engine Officer Courses	$66,500.00	$66,500.00	
Engine Unlicensed Courses	$9,900.00	$9,900.00	
Quarterly Simulator Training	$320,000.00	$320,000.00	
(c) Total Shore Based Training Cost	$3,498,700.00	$3,498,700.00	
(d) Total Training Cost (b + c)	$5,398,700.00	$5,398,700.00	
(e) Total Recurring Program Cost (a + d)	$8,513,384.00	$7,753,946.00	
ONE TIME COSTS			
School Curiculum Development	$25,000.00	$25,000.00	
Training Material Development	$450,000.00	$450,000.00	
Navy Manpower Documents	$45,000.00	$45,000.00	
Navy Training Plans	$78,000.00	$78,000.00	
Pilot Program (from Table 6)	$9,370,190.00	$9,370,190.00	
(f) Total One Time Costs	$9,968,190.00	$9,968,190.00	
(g) Five Year Amortization	$1,993,638.00	$1,993,638.00	
TOTAL ANNUAL PROGRAM COST (e + g)	$10,507,022.00	$9,747,584.00	
Program Cost per Reservist	$21,098.44	$27,076.62	

(2)

ed Crew	20 Ships/Full Crew	20 Ships/Reduced Crew	30 Ships/Full Crew	30 Ships/Reduced Crew
8,645.00	$3,075,875.00	$2,516,625.00	$4,652,960.00	$3,825,270.00
6,601.00	$3,014,900.00	$2,045,825.00	$4,552,499.00	$3,092,426.00
5,246.00	$6,090,775.00	$4,562,450.00	$9,205,459.00	$6,917,696.00
0,000.00	$1,800,000.00	$1,800,000.00	$2,401,200.00	$2,401,200.00
0,000.00	$2,000,000.00	$2,000,000.00	$2,668,000.00	$2,668,000.00
0,000.00	$3,800,000.00	$3,800,000.00	$5,069,200.00	$5,069,200.00
0,000.00	$5,000,000.00	$5,000,000.00	$8,000,000.00	$8,000,000.00
4,700.00	$149,400.00	$149,400.00	$224,100.00	$224,100.00
7,600.00	$55,200.00	$55,200.00	$82,800.00	$82,800.00
6,500.00	$133,000.00	$133,000.00	$199,500.00	$199,500.00
9,900.00	$19,800.00	$19,800.00	$29,700.00	$29,700.00
0,000.00	$640,000.00	$640,000.00	$960,000.00	$960,000.00
8,700.00	$5,997,400.00	$5,997,400.00	$9,496,100.00	$9,496,100.00
8,700.00	$9,797,400.00	$9,797,400.00	$14,565,300.00	$14,565,300.00
3,946.00	$15,888,175.00	$14,359,850.00	$23,770,759.00	$21,482,996.00
5,000.00	$25,000.00	$25,000.00	$25,000.00	$25,000.00
0,000.00	$1,125,000.00	$1,125,000.00	$1,800,000.00	$1,800,000.00
5,000.00	$112,500.00	$112,500.00	$180,000.00	$180,000.00
8,000.00	$195,000.00	$195,000.00	$312,000.00	$312,000.00
0,190.00	$9,370,190.00	$9,370,190.00	$9,370,190.00	$9,370,190.00
8,190.00	$10,827,690.00	$10,827,690.00	$11,687,190.00	$11,687,190.00
3,638.00	$2,165,538.00	$2,165,538.00	$2,337,438.00	$2,337,438.00
7,584.00	$18,053,713.00	$16,525,388.00	$26,108,197.00	$23,820,434.00
7,076.62	$18,516.63	$23,607.70	$17,724.51	$22,472.11

Chapter 10
Summary

Before a Naval Reserve program to crew Ready Reserve Force ships can be implemented, a minimum of five major policy issues must be resolved as follows:

- ❑ Ships to be crewed by Naval Reservists must first be transferred from the Maritime Administration to the U.S. Navy.

- ❑ Numerous Chief of Naval Operations (and subordinate) Instructions must be modified or waived to enable a ship crewed by naval personnel to be operated according to merchant marine standards.

- ❑ Selected Naval Reserve recall procedures should be revised to minimize time required to recall reservists. Ready Reserve Force ship availabilities in Operations Plans and Orders should be revised to reflect this amount of time.

- ❑ Naval Reserve personnel must meet the minimum merchant marine standards of a specific billet prior to assignment to that billet. The current practice of training to meet billet qualifications while serving in that billet would be unsafe in this type of program.

- ❑ Merchant Marine Reserve officers must receive legal authorization to command Naval vessels.

All of the foregoing are deemed essential for implementing a Naval Reserve program to crew Ready Reserve Force ships. Once these actions are successfully implemented, the other barriers to program feasibility are the availability of appropriate officer and enlisted personnel, training requirements and program cost.

Analysis of the Selected Naval Reserve population shows that there would be sufficient enlisted personnel with the necessary background and qualifications to meet the program personnel requirements for most enlisted billets. In those cases where sufficient enlisted personnel would not be available, their billets could be combined with others, filled by personnel of the same rating but a higher grade, or eliminated.

Senior officer availability is, on the other hand, inadequate to meet the requirements of any but the smallest Naval Reserve contingency crewing program size evaluated, 10 ships. Even at that program size there would be an insufficient, or barely sufficient, number of qualified Masters and Chief Engineers to operate the ships. The most feasible means of filling these shortfalls would be to train active duty or retired senior officers or senior enlisted personnel, with the appropriate experience, to fill Command and Department Head level billets.

The amount of training required to qualify an individual without prior merchant marine experience and training to fill a senior merchant marine officer billet would be significant. A minimum of 30 days of concentrated training would be required to qualify retired or active duty naval officers to serve in Command or Department Head level billets aboard a ship crewed and operated to merchant marine standards. Further, it is likely that active duty naval officers, and some retired officers, filling billets in such a program would only rarely serve aboard "their" ship or with its Selected Reserve crew. This would tend to diminish the positive effects of having a crew with a detailed familiarity of their ship since the senior officers are expected to be the technical experts aboard a merchant ship.

The costs for a Naval Reserve contingency crewing program are based on two notional crewing options: a crew of 11 officers and 28 enlisted personnel (full crew option) and a crew of 9 officers and 20 enlisted personnel (reduced crew option). The specific make-up of these crews was detailed in Chapter 7 and program personnel requirements, in Table 7. Program costs were developed for three program sizes: 10 ships, 20 ships and 30 ships. The annual cost to the Navy (in constant Fiscal Year 1995 dollars) for this contingency crewing program ranges between $9.7 million (10 ships/reduced crew) and $26.1 million (30 ships/full crew). The per-reservist cost ranges between $27,077 (10 ships/reduced crew) and $17,725 (30 ships/full crew).

PART 3

CONTINGENCY CREWING

CONCEPT ANALYSES

Chapter 11
Contingency Crewing Concepts

Given the results of the requirements analysis in Part 1 it is apparent that some type of contingency crewing program may be required in the future, in some combination of circumstances, to meet the total crewing requirement of the Reserve Sealift Fleet. However, as stated earlier, the Ready Reserve Force component of the Reserve Sealift Fleet will bear a disproportionate share of crewing shortfalls upon activation. Therefore, this section concentrates on meeting the crewing requirements of the Ready Reserve Force and seeks to answer the following questions:

- ❑ What kind of contingency crewing program should be used for the Ready Reserve Force?
- ❑ How large must a Ready Reserve Force contingency crewing program be?
- ❑ What is the most effective means of ensuring that Ready Reserve Force ships are crewed when they are needed?

While there are a number of potential solutions to shortfalls in Ready Reserve Force crewing, all of these solutions involve one of two basic approaches to the problem. The first, which includes the Naval Reserve concept, would provide complete crews of Government employees for some number of Ready Reserve Force ships. The balance of the Ready Reserve Force would then be crewed through commercial means. Contingency crewing concepts using this approach will be referred to as **Ship Crew Concepts**.

The second approach to contingency crewing for the Ready Reserve Force would augment the maritime labor pool to fill vacant billets aboard Ready Reserve Force ships on an "as-needed" basis. The mariners augmenting the maritime labor pool would be trained by the government but would be assigned to ships through a modified commercial crewing process. Contingency crewing concepts using this approach will be referred to as **Maritime Labor Augmentation Concepts**.

This analysis compares four contingency crewing concepts representative of the two basic approaches (two concepts from each approach). The four concepts were evaluated in both qualitative and quantitative terms. Detailed program cost estimates were developed for each concept as part of the analysis. Each concept was first compared against the other concept of the same type or approach. The concepts were then compared against the two concepts of the other approach. Combinations of concepts from both basic approaches were also considered.

A. Ship Crew Concepts

To assess the impact of the Ship Crew concepts on overall crewing demand, the calculations made in Part 1 for each Case were also made for three demand functions in addition to the base demand function. The three additional demand functions are:

- ❑ Base demand function less 10 ships assigned to a Ship Crew concept program,
- ❑ Base demand function less 20 ships assigned to either one or both Ship Crew concept programs,
- ❑ Base demand function less 30 ships assigned to either one or both Ship Crew concept programs.

The first contingency crewing concept selected to represent this basic approach is the Naval Reserve concept analyzed in Part 2. The second potential crewing concept would be to use Military Sealift Command Civilian Mariners instead of the Naval Reserve to crew a specified number of Ready Reserve Force ships.

(1) Naval Reserve Concept

This concept, as discussed and analyzed in Part 2, envisions a Ready Reserve Force ship crew composed entirely of Naval Reserve personnel filling merchant marine billets. All persons involved in this program would have the necessary merchant marine skills to meet the requirements of their billets. The program would be structured to provide a complete crew to each Ready Reserve Force ship assigned. At no time would uniformed naval personnel serve as part of the same crew as civilians because of the numerous problems that mixed crews create.

The foundation of this concept is that the Naval Reserve already has a number (over 3,000 since October 1993, through September 1995) of commissioned officers who possess U.S. Coast Guard licenses: the Merchant Marine Reserve. Naval Reserve enlisted personnel of appropriate rates and grades would be recruited to fill shipboard billets not requiring licenses. The primary source of these personnel would be current Naval Reserve ship augmentation units being disestablished as the Navy ships they support are decommissioned.

(2) Military Sealift Command Concept

The Military Sealift Command operates a number of Government owned ships with Civil Service employees known as Civilian Mariners. Each Government owned ship operated by the Military Sealift Command is, to the maximum extent possible, operated in accordance with applicable U.S. Coast Guard rules and regulations.

Therefore, all Civilian Mariners possess the appropriate Coast Guard licenses and certificates for their billets. These Civilian Mariners would be fully trained and ready to crew Ready Reserve Force ships assigned to the Military Sealift Command. In fact, the Navy's two Hospital Ships and several Navy Combat Logistics Force ships are already assigned to the Military Sealift Command in a Reduced Operating Status to be crewed by Civilian Mariners when needed.

(a) Civilian Mariner Availability

Like any other ship operator, the Military Sealift Command has a number of Civilian Mariners who are on leave, in training or otherwise not assigned aboard ship. The actual number of individuals who are on the Military Sealift Command payroll but not actually at sea varies but, according to Military Sealift Command personnel, is approximately 25% of the total number of seagoing billets. Put another way, the total number of Civilian Mariners employed by the Military Sealift Command is approximately 125% of the total number of billets aboard the ships they crew.

Some fully trained Civilian Mariners could be available, at no additional cost to the Government, to crew Ready Reserve Force ships. However, it is the position of the Military Sealift Command that this could occur only if the Military Sealift Command did not have to activate Combat Logistics Force ships or other Naval Auxiliaries in Reduced Operating Status assigned to the Military Sealift Command. This position is supported by data received from Military Sealift Command personnel officials (MSC N-13) and summarized in Table 12. When ships in Reduced Operating Status are activated, a much smaller pool of Civilian Mariners is available to provide replacements for sick or injured shipboard personnel. Further, the number of Civilian Mariners in this ashore labor pool includes those persons who cannot be assigned to shipboard duty for health or disciplinary reasons.

The data in Table 12 is calculated assuming, for purposes of example only, that the Military Sealift Command could function for a very limited time during a crisis with as little as one-half of its 25% peacetime ashore labor pool (12.5%). The number of Civilian Mariners that could be available to crew Ready Reserve Force ships using this assumption was computed by subtracting 12.5% of the total billets (Total Billets - Conflict) from the number of unassigned Civilian Mariners. Calculations were made for three different assumptions: that all, half or none of the 10 ships in Reduced Operating Status would be activated.

Only if none of the ships in Reduced Operating Status was activated would any significant number of unassigned Civilian Mariners be available for possible assignment to Ready Reserve Force ships. If these personnel were available, then the shortfalls projected in the most favorable cases (Scenario II, Cases 3 and 4, Maritime Security Program enacted and Ready Reserve Force crew sizes reduced; and Scenario I, Case 4, Maritime Security Program not enacted and Ready Reserve Force crew sizes reduced) could be virtually eliminated.

Table 12
Civilian Mariner Availability to Crew Ready Reserve Force Ships (2001)

Ship Type and Status	Ships	Deck Officer Billets	Engineer Officer Billets	Unlicensed Deck Billets	Unlicensed Engineer Billets
NFAF (CLF) - FOS	31	182	228	1056	567
NFAF (CLF) - ROS	6	20	24	42	46
Special Mission - FOS	12	55	61	162	126
Special Mission - ROS	4	16	12	21	17
Total Billets - Peacetime		273	325	1281	756
Unassigned CIVMARs (@ 25%)		68	81	320	189
Total CIVMAR Labor Pool		341	406	1601	945
ALL ROS SHIPS CREWED					
NFAF (CLF) - Roundout	6	14	22	190	80
Special Mission - Roundout	4	10	12	59	53
Total Billets - Roundout		24	34	249	133
Total Billets - Conflict		297	359	1530	889
Unassigned CIVMARs		44	47	71	56
Unassigned CIVMAR Percentage		13%	12%	4%	6%
CIVMARs Available for RRF		7	2	0	0
HALF OF ROS SHIPS CREWED					
NFAF (CLF) - Roundout	3	7	11	95	40
Special Mission - Roundout	2	5	6	30	27
Total Billets - Roundout		12	17	125	67
Total Billets - Conflict		285	342	1406	823
Unassigned CIVMARs		56	64	195	122
Unassigned CIVMAR Percentage		16%	16%	12%	13%
CIVMARs Available for RRF		20	21	19	19
NO ROS SHIPS CREWED					
NFAF (CLF) - Roundout	0	0	0	0	0
Special Mission - Roundout	0	0	0	0	0
Total Billets - Roundout		0	0	0	0
Total Billets - Conflict		273	325	1281	756
Unassigned CIVMARs		68	81	320	189
Unassigned CIVMAR Percentage		20%	20%	20%	20%
CIVMARs Available for RRF		34	40	160	95

In marked contrast, if half or all of the ships in Reduced Operating Status ships were activated, very few, if any, Civilian Mariners would be available. It would be imprudent to assign Civilian Mariners from the current peacetime ashore labor pool to crew Ready Reserve Force ships because of the possible need for the Military Sealift Command to crew some or all of the ships in Reduced Operating Status. If large numbers of Civilian Mariners are assigned to crew Ready Reserve Force ships they would not be available to crew the Military Sealift Command ships in Reduced Operating Status. Of particular note is that a large number of the Civilian Mariners that might be available are the highly trained seamen required to operate Underway Replenishment rigs aboard Combat Logistics Force ships. These skilled Civilian Mariners could not be easily replaced on short notice.

Therefore, a large number of Civilian Mariners would have to be added to the Military Sealift Command payroll to implement any Military Sealift Command Ready Reserve Force contingency crewing program. Increasing the size of the Civilian Mariner labor pool to provide a contingency crewing capability for the Ready Reserve Force would have a significant impact on the Military Sealift Command. To fully employ all the additional Civilian Mariners, they would have to be fully integrated into job rotation cycles. The effect of employing these additional personnel would be to provide some number of additional leave days to all Civilian Mariners.

(b) Civilian Mariner Leave Considerations

Leave, of all types, is a benefit which Civilian Mariners currently receive in less quantity than their commercial counterparts. The maximum allowable rates of leave accrual for Government employees are specified in 5 USC Subchapter I. Therefore, providing additional leave to Civilian Mariners would require some legislative modification to this Subchapter.

The most likely place for such a modification would be Section 6305 (Home leave; leave for Chief of Missions; leave for crews of vessels). This section specifies the amount of shore leave which Civilian Mariners accrue each month they are assigned to a vessel in addition to the annual leave and sick leave accrued by every Government employee. **The amount of additional leave required to fully establish a Ready Reserve Force contingency crewing program would depend on the number of additional Civilian Mariners to be hired and their impact on the job rotation/leave cycle.**

How much a Ready Reserve Force contingency crewing program would cost and how it would be funded is a key issue. Increasing the total Civilian Mariner payroll would result in a similar increase in the cost of services provided to the Military Sealift Command's customers. However, the cost for additional Civilian Mariners intended to crew Ready Reserve Force ships in a crisis should not be charged to Military Sealift Command customers. This issue could be resolved by establishing

a new line item in the Navy budget which would result in a separate Military Sealift Command appropriation for this purpose. This would permit the Military Sealift Command to calculate charges to customers based on the current Civilian Mariner labor pool and yet maintain a viable contingency crewing capability.

B. Maritime Labor Augmentation Concepts

The two contingency crewing concepts considered in this second of the two possible approaches are the proposed Maritime Administration Civilian Merchant Marine Mobilization Program, and a potential program using Military Sealift Command Civilian Mariners. Results of the mariner shortfall analyses from Part 1 were used to determine the number of personnel required to implement either of these programs and also as the basis for the cost estimates.

(1) Maritime Administration Civilian Merchant Marine Mobilization Program

The Department of Transportation, Maritime Administration, has proposed that a Civilian Merchant Marine Mobilization Program be established to provide, in part, for contingency crewing of the Ready Reserve Force. The program would be split between licensed officers and unlicensed seamen in a ratio approximating projected shortfalls in crewing Ready Reserve Force ships. A very significant requirement for the success of this program is that Congress enact Merchant Seamen's Re-Employment Rights legislation.

Three types of personnel are intended to be involved in this program. First, the program is designed to attract experienced marine personnel who are no longer employed at sea. These persons would be trained to provide professional assistance in activating Ready Reserve Force ships and be available to fill last-minute crew vacancies. Second, newly licensed officers from the maritime academies would be required to serve in this program in return for the Maritime Administration's financing a portion of their education. Finally, funding would be provided for 50 deck and 50 engine department unlicensed entry level jobs (Ordinary Seaman and Wiper) each year on a cost sharing basis with shipowners and labor unions. These jobs would provide career path entry points for future skilled unlicensed personnel and would greatly aid in crewing the Ready Reserve Force over the long term.

The primary training program would be built around Ready Reserve Force ship activations. Initially, about 250 individuals would each receive 14 days of pay and expense reimbursement for participating in one of the scheduled Ready Reserve Force ship test activations conducted each year or receiving simulator, refresher or conversion training. An example of the latter would be qualifying an unlicensed diesel engineer for a similar position aboard a steamship.

The Maritime Administration expects the primary training program to be funded at slightly more than $1 million in its first year to train approximately 250 people. If fully implemented, it is projected to grow to approximately $5 million and 1,000 people by the end of the century as shown in Table 13. The cost of the entry level jobs program is an additional $1 million per year.

Table 13
Estimated Training Costs for Maritime Administration
Civilian Merchant Marine Mobilization Program

Fiscal Year	Trainees	Cost	Entry Level Jobs	Costs	Total Cost
1996	250	$1.15M	100	$1.0M	$2.15M
1997	500	$2.35M	100	$1.0M	$3.35M
1998	750	$3.60M	100	$1.0M	$4.60M
1999*	1,000	$4.90M	100	$1.0M	$5.90M

* Projected program size remains same for FY 2000 and beyond.

Other aspects of this and related Maritime Administration programs include:

- Establishing, in peacetime, the agreements and procedures needed to permit retirees to return to sea for the duration of a conflict or crisis without financial penalty (e.g., permanent loss of union pension benefits) and to permit the exchange of personnel among the different maritime labor unions to alleviate temporary personnel shortages during a crisis. This would permit more efficient use of the existing pool of trained maritime personnel.

- Expanding the use of Reduced Operating Status crews aboard Ready Reserve Force ships. Ships with a small crew of licensed and skilled unlicensed personnel already on board can be activated more quickly than those that have no personnel aboard. In addition, this would reduce the surge demand for maritime labor.

- Collecting, in cooperation with the U.S. Coast Guard, contact information (i.e., current telephone number and mailing address) on trained mariners who are no longer actively employed afloat. This would be a pool from which to recruit experienced personnel.

(2) Military Sealift Command Maritime Labor Augmentation Concept

This concept would fill specific vacancies aboard Ready Reserve Force ships that commercial crewing could not fill, just like the Maritime Administration program. The difference would be that the Military Sealfit Command Civilian Mariners would

require little or no training since they are working mariners, not former mariners working ashore. The same considerations about Civilian Mariner availability and leave discussed above, under Ship Crew Concepts, also apply to this potential program.

A unique aspect of this concept would be mixing Military Sealift Command Civilian Mariners with unionized commercial crews aboard Ready Reserve Force ships. Mixed crews could lead to personnel problems. However, many Civilian Mariners are already union members and those who are not are generally accepted as such. Therefore, this could be a viable means of providing "gap fillers" rather than crewing entire ships if some mechanism to do so could be developed between the Maritime Administration and the Military Sealift Command.

Chapter 12
Cost Analysis

The question then is which of the programs being analyzed will ensure that the Ready Reserve Force can be crewed in the most cost effective manner. First, the two Ship Crew programs will be compared to determine which is the more cost effective. The more cost effective Ship Crew concept will then be evaluated in combination with both the Military Sealift Command and Maritime Administration Maritime Labor Augmentation programs to determine which of four possible program combinations is ultimately the most cost effective.

A. Ship Crew Concept Program Costs

Two contingency crewing concepts have been presented in this study that would seek to alleviate projected shortfalls in crewing the Ready Reserve Force through the assignment, on a bareboat basis, of some Ready Reserve Force ships to either the Naval Reserve or Military Sealift Command. These ships would then be crewed entirely by Naval Reserve personnel or by Military Sealift Command Civilian Mariners.

(1) Naval Reserve

The various program costs to provide complete crews for Ready Reserve Force ships with Naval Reservists were detailed in Part 2. Table 14 restates the total Naval Reserve program costs developed in Chapter 9.

Table 14
Naval Reserve Program Costs (Millions $/Fiscal Year 1995)

Program Size	*Reduced Crew (29 Persons)*	*Full Crew (39 Persons)*
10 Ships	*$9.75*	*$10.51*
20 Ships	*$16.52*	*$18.05*
30 Ships	*$23.82*	*$26.11*

(2) Military Sealift Command

The basic concept of this program is that the number of Civilian Mariners employed by the Military Sealift Command would be augmented to provide a large enough labor pool to crew up to 30 Ready Reserve Force ships. The Ready Reserve Force ships are in addition to the Military Sealift Command ships in Reduced Operating Status that must be crewed by Civilian Mariners. The Civilian Mariner personnel requirements were computed to ensure that the resulting labor pool could not only

provide sufficient crews for the ships but also maintain the current Military Sealift Command 1.25-to-1 personnel-to-billet ratio. This ratio is in accordance with stated Military Sealift Command policy, and is also consistent with the Naval Reserve program sizing for purposes of direct comparison. The personnel requirements for this proposed program are summarized in Table 15, based on the full crew and reduced crew scales used in the requirements analysis.

Table 15
Military Sealift Command Program Personnel Requirements

	10 Ships		20 Ships		30 Ships	
	Full Crew	*Reduced Crew*	*Full Crew*	*Reduced Crew*	*Full Crew*	*Reduced Crew*
Additional Civilian Mariners Required	*490*	*360*	*980*	*720*	*1,460*	*1,090*

Full Crew = 39 Persons. **Reduced Crew = 29 Persons.**

The Military Sealift Command estimates that the annual program cost of one Civilian Mariner is $42,750. It is important to note that, since the program personnel would be Civilian Mariners regularly employed at sea with the Military Sealift Command, no significant training would be required beyond that which is regularly conducted for Civilian Mariners. Additional administrative costs for this program would be minimal. Therefore, the estimated annual personnel cost is the only significant cost to this program. The annual costs for the Military Sealift Command program are provided and compared to the Naval Reserve program costs in a matrix format in Table 16.

It is apparent that, in every possible combination of programs, a Naval Reserve Ship Crew program using the Full Crew (F/C) option is less costly than a Military Sealift Command Ship Crew program using the Reduced Crew (R/C) option. **This conclusion would not change even if the Military Sealift Command program were sized at a 1-to-1 personnel-to-billet ratio.** For this reason the Military Sealift Command Ship Crew program will not be considered for further analysis. Further, the Reduced Crew option will be used in estimating the costs of the Naval Reserve Ship Crew program in the following cost analyses.

Table 16
Ship Crew Program Cost Comparison ($ Millions in Constant FY 95 Dollars)

	MSC 0 Ships	MSC 10 Ships (R/C)	MSC 10 Ships (F/C)	MSC 20 Ships (R/C)	MSC 20 Ships (F/C)	MSC 30 Ships (R/C)	MSC 30 Ships (F/C)
USNR 0 Ships	$ 0.00	$ 15.50	$ 20.84	$ 30.99	$ 41.68	$ 46.49	$ 62.52
USNR 10 Ships (R/C)	$ 9.75	$ 25.25	$ 30.59	$ 40.74	$ 51.43		
USNR 10 Ships (F/C)	$ 10.51	$ 26.01	$ 31.35	$ 41.50	$ 52.19		
USNR 20 Ships (R/C)	$ 16.52	$ 32.02	$ 37.36				
USNR 20 Ships (F/C)	$ 18.05	$ 33.55	$ 38.89				
USNR 30 Ships (R/C)	$ 23.82						
USNR 30 Ships (F/C)	$ 26.11						

R/C = Reduced Crew (29 Persons). F/C = Full Crew (39 Persons).

B. Maritime Labor Augmentation Program Costs

In contrast to the Ship Crew programs, the Maritime Labor Augmentation programs would assign individual mariners to fill those billets aboard Ready Reserve Force ships which could not be filled in a timely manner through commercial means. The basis for both of these programs is that it may not be cost effective to transfer Ready Reserve Force ships on a bareboat basis to either the Naval Reserve or Military Sealift Command. However, there might still be situations in which there were not enough mariners to fully crew Ready Reserve Force ships. In that event, some sort of organized program to **augment** commercial maritime labor pools with trained personnel could be necessary.

There are only two sources for this sort of augmentation. The first, not necessarily in order of preference, is the Military Sealift Command Civilian Mariner labor pool. The second is the proposed Maritime Administration Civilian Merchant Marine Mobilization Program.

(1) Military Sealift Command

The Military Sealift Command budget figure of $42,750 per Civilian Mariner was used in making cost calculations for this section. This cost figure is an average across the entire Civilian Mariner labor pool (i.e, ranging from Master to Assistant Laundryman). However, the Ready Reserve Force billets considered in this analysis require either licensed or skilled unlicensed deck and engineering personnel. Analysis of the compensation levels of representative licensed and skilled unlicensed personnel indicates that this figure may well understate actual costs for such a program.

(2) Maritime Administration

Prudence dictates that any reserve program be sized somewhat larger than the difference between the projected commercial manpower supply and Ready Reserve Force crewing demand. This size difference or safety margin would ensure that sufficient personnel are available despite losses due to accident, illness or other reasons, and to allow for the uncertainties inherent in any long-term projections. Therefore, the personnel requirements for this program were computed with the same margin (25%) as that used for the Naval Reserve and Military Sealift Command programs.

The proposed primary training program is expected to be funded at slightly more than $1 million for the initial fiscal year to train approximately 250 people. If fully implemented, it is projected to grow to approximately $5 million per year and 1,000 trainees by the end of the century. The cost of the entry level jobs program is an additional $1 million per year. A 1,000 person program would meet the program requirement of all but the worst (and least likely) case (Case 1 - Scenario I) with at least a small surplus of personnel. Based on the budgetary estimates provided by the Maritime Administration, this program would have a marginal annual cost of $5,364 per trained person at program maturity.

C. Program Cost Comparison

The personnel requirements, by category, and resultant costs for the Maritime Administration and Military Sealift Command Maritime Labor Augmentation programs are detailed in Table 17. This table also includes the impact on each program of combining it with the Naval Reserve Ship Crew Program.

Because the Military Sealift Command is responsible for crewing several Combat Logistics Force and other Naval Auxiliaries in Reduced Operating Status, the Military Sealift Command program personnel requirement is the same as the Maritime Administration program requirement. The quantities shown in Table 17 are for program sizing purposes only. They are larger than the actual difference between the supply of available mariners and the crewing demand of the Reserve Sealift Fleet detailed in Part 1. The difference between the actual shortfall and the program size is to allow for a safety margin, as discussed above, to ensure that sufficient trained personnel would be available when and where needed.

(1) Naval Reserve Program Impact on Maritime Labor Augmentation Programs

The impact on projected mariner shortfalls of assigning up to 30 ships to the Naval Reserve for crewing was unbalanced. Only in the extreme worst case (Case 1 - Scenario I), is an officer shortage likely to impact ship crewing. This officer shortage could be alleviated by crewing 10 ships with Naval Reservists. In contrast, however, even crewing 30 ships with Naval Reservists would not resolve all shortages of skilled unlicensed personnel except in Scenario II, Cases 3 and 4. Even Case 4, Scenario II, would require 20 ships crewed by Naval Reservists to totally eliminate projected shortfalls of skilled unlicensed deck department personnel. Therefore, crewing some Ready Reserve Force ships entirely with Naval Reserve personnel would also require, in nearly every Case/Scenario combination, a maritime labor augmentation program to completely eliminate all mariner shortfalls.

(2) Total Cost to Eliminate Reserve Sealift Fleet Crewing Shortfalls

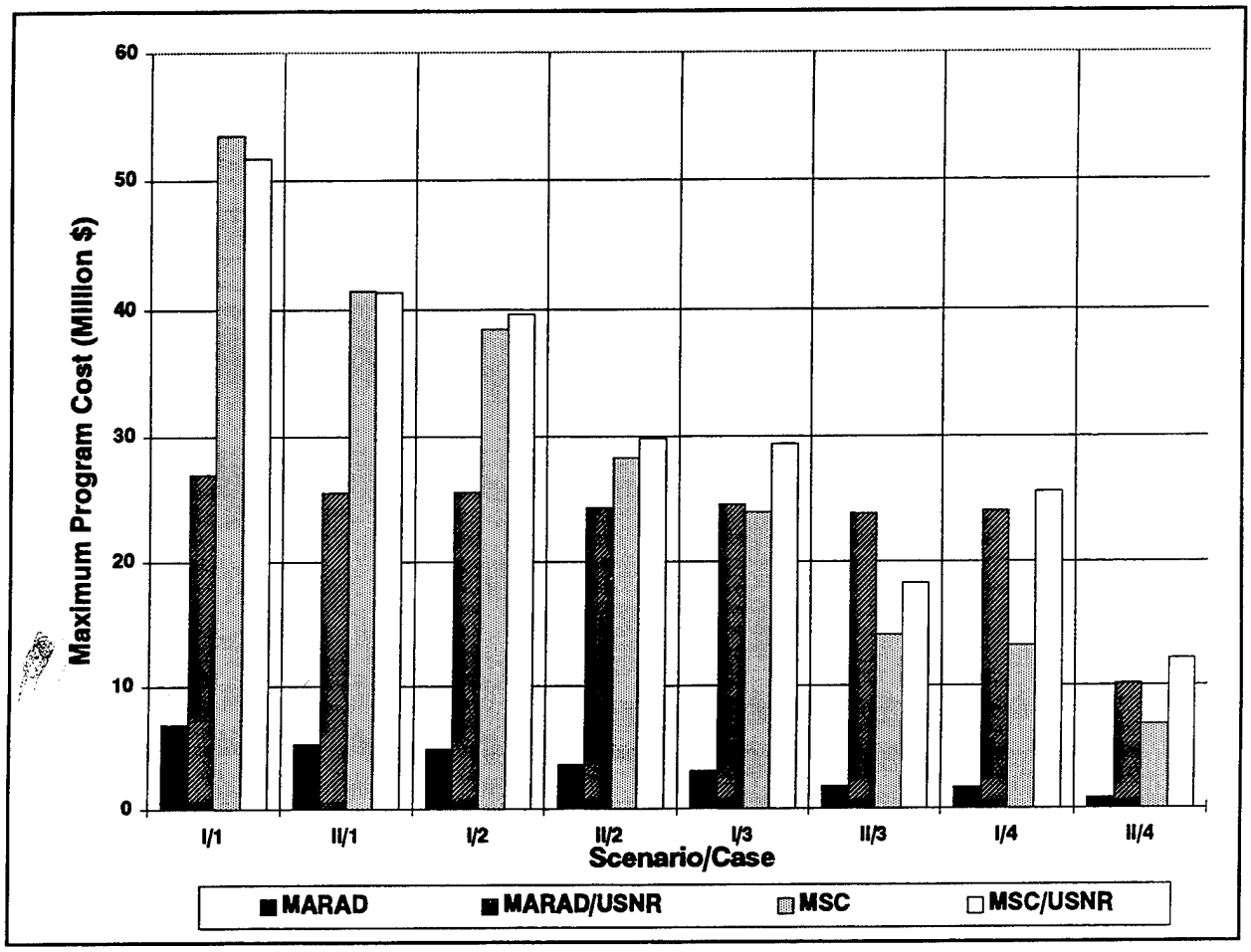
There are four possible combinations of programs which would eliminate all projected shortfalls in Reserve Sealift Fleet crewing. These are:

- ❑ The Maritime Adminstration Program,
- ❑ The Maritime Administration Program plus the Naval Reserve Program,
- ❑ The Military Sealift Command Maritime Labor Augmentation Program,
- ❑ The Military Sealift Command Maritime Labor Augmentation Program plus the Naval Reserve Program.

The **maximum** annual program cost for each of the four possible program combinations, for each of the 8 Case/Scenario combinations analyzed, can be seen in relation to the others in Figure 19. If Military Sealift Command Civilian Mariners

were not otherwise committed, the projected mariner shortfalls in the least demanding Cases (Scenario I/Case 4, Scenario II/Cases 3 and 4) could be filled by Civilian Mariners. However, if existing Civilian Mariners are committed to crew Military Sealift Command Reduced Operating Status ships, then the Maritime Administration program is less costly and, in most cases, significantly less costly than any of the other three possible program combinations.

Figure 19
Maximum Annual Program Cost Comparison



Finally, in terms of **annual program cost per individual**, any Military Sealift Command program would be the most expensive at $42,750 per person. The corresponding cost for the Naval Reserve program, including start-up costs, ranges from $27,077 to $17,725 (depending on program size) while the Maritime Administration's cost estimate is $5,364. Even if the Maritime Administration's budgetary cost were to double upon program execution, it would still be less than two-thirds of the lowest per-person cost of the Naval Reserve program.

Table 17
Maritime Labor Augmentation Program Personnel Requirements and Total Program Cost ($M) (Year 2005)

Scenario	Case	USNR Ship Crews	Deck Officers	Engineer Officers	Unlicensed Deck	Unlicensed Engineers	Total Personnel	USNR Program Cost	MARAD Program Cost	Total Cost MARAD + USNR	MSC Program Cost	Total Cost MSC + USNR
I-No MSP	1-Full Crew	0	10	40	600	600	1250	$ 0.00	$ 6.70	N/A	$ 53.44	N/A
I-No MSP	1-Full Crew	10	0	0	480	500	980	$ 9.75	$ 5.26	$ 15.01	$ 41.90	$ 51.65
I-No MSP	1-Full Crew	20	0	0	350	380	730	$ 16.52	$ 3.92	$ 20.44	$ 31.21	$ 47.73
I-No MSP	1-Full Crew	30	0	0	230	290	520	$ 23.82	$ 2.79	$ 26.61	$ 22.23	$ 46.05
I-No MSP	2-Full Crew with ROS	0	0	0	570	330	900	$ 0.00	$ 4.83	N/A	$ 38.48	N/A
I-No MSP	2-Full Crew with ROS	10	0	0	450	250	700	$ 9.75	$ 3.75	$ 13.50	$ 29.92	$ 39.67
I-No MSP	2-Full Crew with ROS	20	0	0	320	180	500	$ 16.52	$ 2.68	$ 19.20	$ 21.38	$ 37.90
I-No MSP	2-Full Crew with ROS	30	0	0	200	110	310	$ 23.82	$ 1.66	$ 25.48	$ 13.25	$ 37.07
I-No MSP	3-Reduced Crew	0	0	0	340	220	560	$ 0.00	$ 3.00	N/A	$ 23.94	N/A
I-No MSP	3-Reduced Crew	10	0	0	250	160	410	$ 9.75	$ 2.20	$ 11.95	$ 17.53	$ 27.28
I-No MSP	3-Reduced Crew	20	0	0	170	110	280	$ 16.52	$ 1.50	$ 18.02	$ 11.97	$ 28.49
I-No MSP	3-Reduced Crew	30	0	0	70	60	130	$ 23.82	$ 0.70	$ 24.52	$ 5.56	$ 29.38
I-No MSP	4-Reduced Crew with ROS	0	0	0	310	0	310	$ 0.00	$ 1.66	N/A	$ 13.25	N/A
I-No MSP	4-Reduced Crew with ROS	10	0	0	220	0	220	$ 9.75	$ 1.18	$ 10.93	$ 8.40	$ 19.15
I-No MSP	4-Reduced Crew with ROS	20	0	0	140	0	140	$ 16.52	$ 0.75	$ 17.27	$ 5.98	$ 22.50
I-No MSP	4-Reduced Crew with ROS	30	0	0	40	0	40	$ 23.82	$ 0.21	$ 24.03	$ 1.71	$ 25.53
II-MSP	1-Full Crew	0	0	0	450	520	970	$ 0.00	$ 5.20	N/A	$ 41.47	N/A
II-MSP	1-Full Crew	10	0	0	330	410	740	$ 9.75	$ 3.97	$ 13.72	$ 31.64	$ 41.39
II-MSP	1-Full Crew	20	0	0	210	300	510	$ 16.52	$ 2.73	$ 19.25	$ 21.80	$ 38.32
II-MSP	1-Full Crew	30	0	0	90	210	300	$ 23.82	$ 1.61	$ 25.43	$ 12.82	$ 36.64
II-MSP	2-Full Crew with ROS	0	0	0	420	240	660	$ 0.00	$ 3.54	N/A	$ 28.22	N/A
II-MSP	2-Full Crew with ROS	10	0	0	300	170	470	$ 9.75	$ 2.52	$ 12.27	$ 20.09	$ 29.84
II-MSP	2-Full Crew with ROS	20	0	0	180	90	270	$ 16.52	$ 1.45	$ 17.97	$ 11.54	$ 28.06
II-MSP	2-Full Crew with ROS	30	0	0	60	20	80	$ 23.82	$ 0.43	$ 24.25	$ 3.42	$ 27.24
II-MSP	3-Reduced Crew	0	0	0	190	140	330	$ 0.00	$ 1.77	N/A	$ 14.11	N/A
II-MSP	3-Reduced Crew	10	0	0	100	70	170	$ 9.75	$ 0.92	$ 10.67	$ 7.27	$ 17.02
II-MSP	3-Reduced Crew	20	0	0	20	20	40	$ 16.52	$ 0.21	$ 16.73	$ 1.71	$ 18.23
II-MSP	3-Reduced Crew	30	0	0	0	0	0	$ 23.82	$ 0.00	$ 23.82	$ 0.00	$ 23.82
II-MSP	4-Reduced Crew with ROS	0	0	0	160	0	160	$ 0.00	$ 0.85	N/A	$ 6.84	N/A
II-MSP	4-Reduced Crew with ROS	10	0	0	80	0	80	$ 9.75	$ 0.43	$ 10.18	$ 3.42	$ 13.17
II-MSP	4-Reduced Crew with ROS	20	0	0	0	0	0	$ 16.52	$ 0.00	$ 16.52	$ 0.00	$ 16.52
II-MSP	4-Reduced Crew with ROS	30	0	0	0	0	0	$ 23.82	$ 0.00	N/A	$ 0.00	N/A

Chapter 13
Qualitative Analysis

An effective contingency crewing program must provide personnel who are ready, willing and able to competently crew Ready Reserve Force ships at any time and under all circumstances. Therefore, an effective contingency crewing program must provide personnel who are available on short notice, committed to serving, and fully trained within the framework of a program that is balanced, sustainable, and cost effective. From a qualitative perspective, any program which fully meets all these criteria provides a high level of confidence to defense planners that the program can accomplish its mission.

A. Availability

Ready Reserve Force ships must be crewed very quickly. Often there is little or no advance notice that a ship must be activated. It is vital that all senior crew members (Master, Chief Engineer, Chief Mate, First Assistant Engineer, Boatswain and Chief Steward) be aboard the ship within 24 hours of the activation order for a ships in 4 or 5 day readiness status. Other crew members not already on board must arrive within the following 24 hours. Meeting the requirements of a ship in 10 day readiness status requires that the senior crew members be aboard within 5 days of the activation order with the balance of the crew reporting within another 24 to 48 hours. For those ships in a 20 day readiness status there is more time to assemble the crew, but all of the crew should be aboard within 2 weeks of the activation order. Therefore, an effective contingency crewing program must be able to quickly provide senior personnel to the ships, perhaps within as little as 24 hours of the activation order. An effective program must also be able to provide the balance of the crew to each ship very shortly thereafter.

B. Commitment

A contingency crewing program whose personnel decline to serve when called, for any reason, has failed. Defense planners require solid assurances that the ships will be fully crewed, on time, when needed. This implies that program personnel are committed to serve when called, leaving their families, homes and jobs behind. Going to sea on a merchant ship is a dangerous and physically uncomfortable way of life. During a conflict this "civilian" occupation can become as dangerous as front-line combat duty. Therefore, because of the additional dangers involved, the commitment by program personnel to a contingency crewing program must be at a higher level than that required to serve in an office or rear area.

A true commitment to serve must be more than just a legal document or obligation. Neither the civil nor the military justice system can compel individuals to do something against their will. A citizen may always elect to take the consequences of refusing to serve (including fines and/or imprisonment). Although these

consequences can have a powerful coercive effect, time is required to make their reality and certainty apparent. The key factor is time. Because of the very short time frame in which Ready Reserve Force ships must be crewed, any legal contract to do so is essentially unenforceable.

Therefore, the persons and organizations involved in contingency crewing programs must be, first and foremost, committed to serve on moral grounds regardless of legal contracts or agreements. In effect, a social or moral contract of commitment to serve must exist between the individual reservist and the Government (or other institution). The basis for this contract is that, in return for disrupting their peacetime life to serve aboard a Ready Reserve Force ship, they will be financially secure both during and after the crisis. Without a social contract of commitment between individuals and the Government (or other institution) no contingency crewing program can be expected to be effective. Guaranteeing that individuals will not lose their jobs (re-employment rights) when they serve their country is an essential component of this contract.

C. Training

Ready Reserve Force crews will not have the luxury of weeks to polish their skills before getting underway. Because the ships must be ready for their missions on short notice, their crews must be fully trained and ready when they report for duty. Thus a contingency crewing program requires a much higher level and quality of peacetime training than is normally associated with most other "reserve" programs.

The two components of any training program are acquiring new skills and retaining those skills, once learned, at a specified level of competence. For a Ready Reserve Force contingency crewing program, skill retention is the more important. However, if the program is to be self-sustaining, a number of persons must continually be taught new skills for entry into, or upgrading within, the program .

A significant aspect of individual and crew readiness, and skill retention, is the degree of familiarity with the systems and equipment aboard the ship to which each individual is assigned. The ideal is for crew members to demonstrate periodically that they can competently operate specific equipment and systems and perform their assigned duties aboard a specific ship. However, this may not always be feasible.

An acceptable alternative would be for crew members to familiarize themselves with the ship and perform skill retention training in theory, basic principles and other subjects applicable to the classroom while the ship is in reserve or "cold iron" status. Operational competency would be demonstrated aboard a similar ship, or ship type, that is operational. Additionally, simulators provide excellent opportunities to practice many procedures which cannot be performed aboard a cold ship and some which should not be performed aboard an operational ship.

Where there is no opportunity to train on the specific ship that an individual will be assigned to, detailed operating manuals, procedures and schematics should be developed for the ship's current configuration. This effort, taken early, can significantly reduce the amount of on-the-job training required of the new crew if it has never before seen the ship.

D. Balance

An effective contingency crewing program must be able to fill all of the billets for which it is responsible. This means that the program must have enough personnel with the right training in place to meet requirements. In general, every program will need to incorporate the broad spectrum of skills and experience found in every merchant ship crew. The precise mix of skills and experience must mirror the shortfalls that the program is expected to fill. For example, a program with a large number of licensed personnel and very few unlicensed personnel would be unacceptable if the primary personnel requirement were for unlicensed personnel. Similarly, a program with large numbers of junior officers and very few senior officers could not meet a requirement to provide large numbers of the latter.

E. Sustainability

Once a contingency crewing program is established it must continue to provide trained crews for an indeterminate period. Because trained personnel will, over time, leave the program, there must be a constant inflow of new personnel and new challenges to those already in the program. The inflow of people may come from radically different sources, depending on what vacancies arise for different skill and experience levels. Recruiting to fill these vacancies must be carefully planned to ensure program balance. Similarly, careful attention must be paid to the size and basic qualifications of the targeted recruiting populations to track, and predict where possible, significant changes in each population.

A second consideration is whether or not the program can sustain itself over a long period (greater than 180 days) of active service. With the small crew size and generally higher workload placed on merchant ship crews, some extended leave, not less than 30 to 60 days, should be granted at an appropriate time. Trained and competent reliefs for persons given leave must be provided. In addition, it is inevitable that some crew members will need to be relieved due to injury, sickness or disciplinary reasons. These persons must be replaced on very short notice to maintain the overall efficiency of the ship, particularly if the individual occupies a key billet. Therefore, an effective contingency crewing program will have a core of trained personnel, or personnel in training, who can relieve or replace persons aboard ship when required. Based on maritime industry experience and practice this core group should equal at least 25% of the total number of shipboard billets.

F. Cost Effectiveness

Given adequate funding, most program deficiencies can be overcome. Fiscal reality and good business sense require that the selected program provide the highest quality (lowest risk of program failure), over and above minimum program requirements, at the lowest overall cost. However, even the most cost effective option may not be affordable in terms of budgets and competing priorities. In this event, the cost of having a program must be weighed, by the decision maker, against the risks (which are not necessarily financial) that will be incurred if, in this case, all the ships in the Reserve Sealift Fleet cannot be crewed when needed. This risk may either be evaluated in relative terms or quantified in some fashion to permit analysis.

G. Qualitative Analysis

Because these criteria vary in importance, they were assigned relative weights ranging from 1 (least important) to 3 (most important). Each program was then evaluated against each of the criteria and a numeric grade assigned, ranging from 1 (lowest) to 10 (highest). The total score for each program was computed as the sum of the weighted scores, as shown in Table 18. The Maritime Administration program was given two grades, with and without Mariner's Re-Employment Rights legislation, the former yielding the higher (parenthesized) score. Sensitivity analyses showed that the qualitative analysis is insensitive to small changes in either criteria weighting or grading. For example, increasing the cost effectiveness weight from 3 to 4 did not change the results of the analysis. Similarly, giving the Naval Reserve program a perfect grade (10) and the Maritime Administration program the minimum grade (0) for commitment did not change the outcome.

Table 18
Qualitative Analysis Summary

Criterion	*Weight*	*Naval Reserve (Ship Crew)*		*Military Sealift Command (Augmentation)*		*Maritime Administration (Augmentation)*	
		Grade	*Score*	*Grade*	*Score*	*Grade*	*Score*
Availability	2	2	4	9	18	6	12
Commitment	3	9	27	8	24	3 (7)	9 (21)
Training	2	3	6	7	14	5	10
Balance	2	1	2	7	14	8	16
Sustainability	1	3	3	8	8	5	5
Cost Effectiveness	3	1	3	2	6	9	27
Total			*45*		*84*		*79 (91)*

No program scored a perfect 10 on any criterion. The reasons for awarding the low grades (5 or less) are discussed below.

(1) Naval Reserve Program

Availability: Selected Naval Reserve personnel cannot be made available as soon as personnel in either of the other two programs. This is very simply because neither the Military Sealift Command nor, apparently, the Maritime Administration programs would require the Presidential-level decision process that is required for a Selected Reserve recall and activation. Further, the Selected Reserve mobilization process involves a number of time consuming steps to make the transition from civilian to military status. Neither of the civilian programs would require this level of administrative processing.

Training: Another aspect of the Naval Reserve program is that a significant number of senior officers would require extensive training to become qualified for their billets. Senior officer qualification programs would require significant dedication and time on the part of each individual seeking to become qualified. Neither the Military Sealift Command nor Maritime Administration program would require that level of training because each would be made up of personnel already qualified for the billets they would fill. However, the Naval Reserve program could provide very highly trained and competent crews having a detailed familiarity with the specific type and class of vessel they would be expected to operate in a crisis or conflict. Neither of the other two programs would provide this level of ship type/class familiarity across the full spectrum of the crew because they would not necessarily train aboard the ships they would crew.

Balance: The Naval Reserve could provide sufficient personnel to fill nearly every billet aboard as many as 30 Ready Reserve Force ships with enough additional personnel for training and attrition needs. However, the Naval Reserve would have difficulty filling the key senior officer billets without significant changes in administrative procedures and a major recruiting program or augmentation from the retired or active duty surface warfare communities. The results of the requirements analysis demonstrate that, given the unbalanced nature of the projected shortfalls, a Ship Crew program could not resolve the shortages of skilled unlicensed personnel except where reduced crew sizes are combined with enactment of the Maritime Security Program.

Sustainability: A Naval Reserve contingency crewing program would be heavily dependent on a continuous inflow of engineers qualified to operate steam propulsion plants from active status. This stream of engineering personnel available to the Naval Reserve program should increase in the short term as the number of steam propelled ships in the Navy rapidly diminishes. This is due to the replacement of steam powered ships by gas turbine powered ships in the fleet. However, when the number of steam propelled Navy ships stabilizes at what is

expected to be a very low number, this flow of steam trained personnel into the Naval Reserve will dwindle. Further, as the Ready Reserve Force continues its envisioned transition from steam to diesel propulsion there will be even fewer qualified Navy personnel available to the Naval Reserve due to the large number of gas turbine powered ships and relative scarcity of large, medium speed, diesel propelled ships in the Navy. Many engineering skills are readily transferrable between the various types of propulsion plants. However, large, slow or medium speed main propulsion diesel engines require some unique skills that are not required to operate the smaller, high speed, diesel engines commonly used to drive electrical generators. Therefore, the loss of operational steam propulsion plant experience and training in the active duty Navy, combined with the future requirement to crew more diesel powered Ready Reserve Force ships, would impose additional training burdens on the Naval Reserve program.

Cost Effectiveness: Using the lowest cost (Reduced Crew) Naval Reserve program option as a basis, in no Case, in either Scenario, is the Naval Reserve program more cost effective than the Maritime Administration program. At best, a Naval Reserve program would be about 3 times more expensive than a Maritime Administration program which achieves the same goal. In comparison with the Military Sealift Command Maritime Labor Augmentation program, the Naval Reserve program would be more cost effective in Cases 1 and 2 (Full Crew and Full Crew with Reduced Operating Status Crews, respectively). However, in Cases 3 and 4 (Reduced Crew and Reduced Crew with Reduced Operating Status Crews, respectively), the Military Sealift Command program is the more cost effective.

(2) Military Sealift Command Augmentation Program

Cost Effectiveness: The high cost of adding each full-time Civilian Mariner to the current Military Sealift Command payroll ($42,750/person) renders this program cost ineffective not only in comparison to the Maritime Administration program but also to the Naval Reserve program in 5 of the 8 Scenario/Case Combinations. Further, while not necessarily a qualitative barrier, 5 USC 6305 (Home Leave; leave for Chiefs of Missions; leave for crews of vessels) would need to be modified to permit the increases in leave accrual rates required to create this program.

(3) Maritime Administration Program

Commitment: This program has one major qualitative challenge. It lacks the re-employment protections enjoyed by members of the other two programs. Without the commitment to serve that these protections support, strategic mobility planners may have less confidence in this program's ability to ensure the availability, on short notice, of qualified crews. Enactment of Mariner's Re-employment Rights legislation would resolve this problem. Failure to do so would have a negative impact on the nation's ability to crew the Ready Reserve Force.

Training: One particular advantage of the Maritime Labor Augmentation programs over the Ship Crew programs is that they can target training and training funds at specific personnel shortages in the active merchant marine labor pool. The Maritime Administration program has this flexibility because it is not required to fill every billet aboard every ship covered by the program. Only those billets that could not be expeditiously filled through normal commercial means would need to be filled through this program.

In contrast to a Ship Crew program, which would be required to fill every billet aboard a ship, a Maritime Labor Augmentation program would need to fill relatively few billets. Perhaps only a few persons from a Maritime Labor Augmentation program would be required to get a ship underway instead of the full complements of 30 to 40 persons required by a Ship Crew program such as the Naval Reserve program. This would permit the Maritime Administration to concentrate its programmatic efforts on providing additional skilled unlicensed deck and engineering personnel, ensuring that each ship is correctly and efficiently activated when needed.

Sustainability: This program faces one of the same challenges that a Naval Reserve program must face. The number of personnel with steam propulsion plant experience is steadily declining as merchant ships convert from steam to diesel propulsion. This trend will, just as with the Naval Reserve program, put an additional burden on the training required for program personnel. However, as the Ready Reserve Force continues its transition from a largely steam propelled fleet to one in which the majority of ships are diesel propelled, its composition will more closely mirror the make-up of the commercial fleet. Thus, for the Maritime Administration program, this additional training burden should diminish over time.

Chapter 14
Summary

Of the two Ship Crew programs, the Naval Reserve program is consistently more cost effective than the Military Sealift Command program. Therefore, the Military Sealift Command Ship Crew program was eliminated from further analysis.

The Maritime Administration Civilian Merchant Marine Mobilization Program is more cost effective than a similar Military Sealift Command augmentation program. In no Case is the Naval Reserve program more cost effective, on either a total cost basis or cost-per-reservist basis, than the Maritime Administration Civilian Merchant Marine Mobilization Program.

If none of the Military Sealift Command ships in Reduced Operating Status were activated there could be a number of unassigned Civilian Mariners available for possible assignment to Ready Reserve Force ships. However, only in the least demanding cases would the projected shortfalls be sufficiently small that they could be completely filled by unassigned Civilian Mariners. To meet the requirement of the more demanding and more likely Cases, a large number of Civilian Mariners would have to be added to the Military Sealift Command peacetime labor pool.

Qualitative analysis shows the Naval Reserve program to be the weakest of the three programs analyzed, with deficiencies in 4 of the 6 criteria. If re-employment rights are enacted, the Maritime Administration program is the strongest program of the three. Without re-employment rights enactment, the Maritime Administration program ranks only slightly below the Military Sealift Command Maritime Labor Augmentation program. However, the Military Sealift Command Maritime Labor Augmentation program is significantly less cost effective than the Maritime Administration program.

PART 4

CONCLUSIONS

Chapter 15
Conclusions

A. Requirement for a Ready Reserve Force Contingency Crewing Program

Significant reductions in the number of Ready Reserve Force ship billets and extensive use of Reduced Operating Status crews, throughout the Reserve Sealift Fleet, would minimize shortfalls in the supply of skilled mariners to crew ships of the Ready Reserve Force. Although in only one of the Case/Scenario combinations analyzed is a shortage of licensed officers projected, shortfalls in the supply of skilled unlicensed mariners are projected in every Case analyzed and may already exist. Projected shortfalls of skilled mariners are neither homogeneous nor proportional to shipboard billet structures.

It would appear highly unlikely, even in the most extreme worst case, that any ship would be totally uncrewed. Rather, the most likely situation is that the activation and sailing of numerous ships could be delayed due to the lack, in each case, of perhaps 4 to 6 critical unlicensed personnel. Because of the imbalance in shortfalls between officers and skilled unlicensed mariners, a Ship Crew program large enough to overcome shortages among skilled unlicensed personnel would create a significant surplus of officers. Therefore, crewing some Ready Reserve Force ships entirely with Government employees, whether military or civilian, is not an effective way to resolve commercial mariner shortfalls.

Enactment of the Maritime Security Program and its associated re-employment rights legislation reduced the projected shortfalls of skilled unlicensed mariners by 15% to 70%, depending on the Case, and eliminated the licensed officer shortfall in the one Case in which it is projected. Failure to enact re-employment rights legislation would significantly reduce the projected surpluses of licensed officers. Its impact on the supply of skilled unlicensed mariners, although less significant, would also be negative.

The analysis was relatively insensitive to both the ability to cross-level mariners across labor union jurisdictions and minor variations in the size of the Reserve Sealift Fleet. However, significant reductions in the size of the Reserve Sealift Fleet will directly reduce crewing demand and, thereby, shortfalls.

B. Naval Reserve Contingency Crewing Concept Feasibility

Before a Naval Reserve program to crew Ready Reserve Force ships can be implemented, a minimum of five major policy issues must be resolved as follows:

- ❑ Transfer ships to be crewed by Naval Reservists from the Maritime Administration to the U.S. Navy Department.

- ❑ Modify or waive multiple Chief of Naval Operations (and subordinate) instructions to enable a ship crewed by naval personnel to be operated according to merchant marine standards.

- ❑ Revise Selected Naval Reserve recall procedures to minimize time required to recall reservists and revise ship availability in Operations Plans and Orders, if necessary, to reflect this amount of time.

- ❑ Change Naval Reserve and Naval Surface Reserve Force training and personnel policies to create unskilled "in-training" mobilization billets and require program personnel to meet minimum merchant marine standards prior to assignment to a skilled mobilization billet.

- ❑ Authorize Merchant Marine Reserve officers to command Naval vessels.

All of the foregoing are deemed essential for implementing a Naval Reserve program to crew Ready Reserve Force ships. Once these decisions are made, the other barriers to program feasibility are the availability of appropriate officer and enlisted personnel, training requirements and program cost.

Analysis of the Selected Naval Reserve population shows that there would be sufficient enlisted personnel with the necessary background and qualifications to meet the program personnel requirements for most enlisted billets. In those cases where sufficient enlisted personnel would not be available, their billets could be combined with others, filled by personnel of the same rating but a higher grade, or eliminated.

Senior officer availability is, on the other hand, inadequate to meet the requirements of any but the smallest Ready Reserve Force contingency crewing program size evaluated, 10 ships. Even at that program size there would be an insufficient, or barely sufficient, number of qualified Masters and Chief Engineers to operate the ships. The most feasible means of filling these shortfalls would be to train active duty or retired senior officers or senior enlisted personnel, with the appropriate experience, to fill Command and Department Head level billets.

The amount of training required to qualify an individual without prior merchant marine experience and training to fill a senior merchant marine officer billet would be significant. A minimum of 30 days of concentrated training would be required to qualify retired or active duty naval officers to serve in Command or Department Head level billets aboard a ship crewed and operated to merchant marine standards. Further, it is likely that active duty naval officers, and some retired officers, filling billets in such a program would only rarely serve aboard "their" ship or with its Selected Reserve crew. This would tend to diminish the positive effects of having a crew with a detailed familiarity of "their" ship since the senior officers are expected to be the technical experts aboard a merchant ship.

The costs for a Naval Reserve contingency crewing program are based on two notional crewing options: a crew of 11 officers and 28 enlisted personnel (full crew) and a crew of 9 officers and 20 enlisted personnel (reduced crew). The specific make-up of these crews and the program personnel requirements are detailed in Chapter 4. Program costs were developed for three program sizes: 10 ships, 20 ships and 30 ships. The annual cost to the Department of Defense (Navy) for this contingency crewing program ranges between $9.7 million (10 ships/reduced crew) and $26.1 million (30 ships/full crew). The per-reservist cost ranges between $27,077 (10 ships/reduced crew) and $17,725 (30 ships/full crew).

C. Analysis of Program Quality and Cost Effectiveness

The Naval Reserve program was consistently more cost effective than the similar Military Sealift Command Ship Crew program. Therefore, the Military Sealift Command Ship Crew program was not considered further. The Maritime Administration Civilian Merchant Marine Mobilization Program was more cost effective than a similar Military Sealift Command augmentation program. In many of the Cases, combinations of this Military Sealift Command program and the Naval Reserve program were less costly than the Military Sealift Command program alone. In no Case/Scenario combination was the Naval Reserve program more cost effective, on either a total cost basis or cost-per-reservist basis, than the Maritime Administration program.

From a qualitative perspective, the strongest program, if re-employment rights are enacted, would be the Maritime Administration program. If re-employment rights are not enacted the Military Sealift Command program to augment available maritime labor would be the stronger by a small margin. In any event, the Naval Reserve program proved to be the weakest, by far, of the programs analyzed.

D. Ability of U.S. Flag Merchant Marine to Support the Ready Reserve Force

The Maritime Administration fleet projections used in this study show that the U.S. flag merchant marine is expected to shrink steadily and significantly, in terms of both ships and mariners crewing those ships throughout the 1994 - 2005 period analyzed. Analysis of the crewing requirements of the Reserve Sealift Fleet over the same period indicates that some crewing shortfalls likely will occur even in the best Scenario/Case combination analyzed. Further, given the negative trend in the size of the active U.S. flag merchant marine, small shortfalls in 2005 will probably become larger shortfalls in later years.

Therefore, prudence dictates that a cost effective contingency crewing program tailored to fill expected personnel shortfalls should be organized and implemented prior to 2005. The alternative -- to reduce the size of the Reserve Sealift Fleet to a level supportable by the active U.S. flag merchant marine -- requires acceptance of

greater reliance on foreign flag shipping in a contingency.

E. Constraints on Utilization of Available Maritime Labor

The lack of re-employment rights deters some mariners, both actively sailing and employed ashore, from volunteering to crew Reserve Sealift Fleet ships. To a lesser extent, Reserve Sealift Fleet crewing also is hampered by the inability to assign personnel from a given labor union to a ship contractually crewed by a rival union. The first of these constraints could be eliminated by enacting mariners' re-employment rights legislation. The second could be alleviated by inter-union agreements developed under the aegis of the Maritime Administration. Both are recognized as barriers to timely Reserve Sealift Fleet crewing, and both could be alleviated at no cost to the Government. In the absence of Government action to eliminate these barriers, their continued existence will exacerbate potential crewing shortfalls. This, in turn, will require a somewhat larger and, thus, more expensive contingency crewing program.

F. Final Conclusions

From the analyses conducted for this study the final conclusions are that:

- Where projected shortfalls exist they may be eliminated, or at least minimized, through the year 2005 by reducing Ready Reserve Force crew sizes and establishing Reduced Operating Status crews aboard those ships in the highest readiness status.

- Retaining a block of 21 dry cargo ships, mostly breakbulks, in the Ready Reserve Force until the year 2001 creates, in the year 2000, the largest or second-largest maritime labor shortfalls for every Case/Scenario combination.

- Crewing Ready Reserve Force ships with Selected Naval Reserve personnel would require changing multiple Department of Defense and Department of Transportation policies.

- A Naval Reserve program to crew Ready Reserve Force ships could successfully crew up to 10 ships. A larger program would require more senior officers qualified to fill Command and Department Head billets aboard ship than would be available within the Naval Reserve.

- Projected shortfalls in crewing the Ready Reserve Force are neither proportional nor balanced in comparison to the pool of available mariners. These shortfalls are, therefore, not susceptible to being efficiently reduced or eliminated by a Ship Crew program such as the Naval Reserve program.

- The Naval Reserve program is the least effective and most expensive of the programs analyzed.

- In every Case/Scenario combination analyzed, the least expensive way to ensure crew availability for Ready Reserve Force ships is the Maritime Administration's Civilian Merchant Marine Mobilization Program. However, in the least demanding Cases (Scenario I/Case 4, Scenario II/Cases 3 and 4), the projected mariner shortfalls are so small that they could be filled by existing Military Sealift Command Civilian Mariners if they were not otherwise committed.

- If Mariner's Re-Employment Rights are enacted, the Maritime Administration program is, qualitatively, the strongest program. Without Mariner's Re-Employment Rights enactment, the qualitative difference between the Maritime Administration program and the Military Sealift Command Maritime Labor Augmentation program is insignificant.

- Some fully trained Military Sealift Command Civilian Mariners could be available, at no additional cost to the Government, to assist with crewing Ready Reserve Force ships. However, it is the position of the Military Sealift Command that this could occur only if the Military Sealift Command did not have to activate Combat Logistics Force ships or other Naval Auxiliaries in Reduced Operating Status.

- The best possible course of action, for the period 1995 through 2005, to minimize maritime labor shortfalls and maximize readiness, would be, in order of priority, to:
  - Reduce Ready Reserve Force crew sizes.
  - Continue to fully fund Reduced Operating Status crews aboard Ready Reserve Force ships which have the highest readiness requirement.
  - Enact Mariner's Re-Employment Rights legislation.
  - Establish inter-union agreements to cross-level mariners during a crisis.
  - Negotiate agreements which ensure that all U.S. flag ship operators will make their personnel on leave available to crew Ready Reserve Force ships without prejudicing their current positions or seniority.
  - Follow through on planned actions to enhance the supply of mariners during a crisis or conflict.
  - Establish a small, cost effective, contingency crewing program or other cost effective means to ensure Ready Reserve Force availability.

- By the year 2005, based on current fleet projections, either the size of the Reserve Sealift Fleet must be reduced, or a cost effective contingency crewing program or other cost effective means to ensure Ready Reserve Force availability must be fully implemented, or some combination of these put into effect.

Appendix A

EXTRACTS FROM "MANNING THE READY RESERVE FORCE"

NAVAL WAR COLLEGE
Newport, R.I.

MANNING THE READY RESERVE FORCE

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Advanced Research Department.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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19 June 1992

Paper directed by
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Department of National Security Decision Making

Approved by:

Faculty Research Advisor

6/9
Date

ABSTRACT

Sealift is needed for National Defense. The best sour e of sealift is a healthy Merchant Marine. The U.S. Merchant Marine is in a serious downward spiral, to make up for the lack of available commercial ships the RRF (a subset of the NDRF) was created. These ships are laid up in increased states of readiness and are dependent on the existing pool of available merchant mariners for manning. Unfortunately as the Merchant Fleet declines mariners available to man the RRF also dwindles, until now there is serious doubt that there are sufficient mariners available to provide crews for the RRF.

Numerous studies of this problem have been based on statistics, exercises and speculation. The activation of the RRF for Desert Shield/Desert Storm involved 80% of the ships and was the only real exercise of the RRF to date. Lessons learned from Desert Shield/Desert Storm bear on the validity of the previous studies and the conclusions drawn.

This paper will consider only the issue of manning for the RRF in it's present and planned size. The research involves published and unpublished documents relating to the RRF and information gleaned from government databases available to the author.

The chief findings of the study are that a quantitative and qualitative manning problem exists and is becoming worse. The problem is greatly exacerbated by present procedures for distributing the manpower. Solutions have been proposed to increase available manpower. These include a civilian reserve program, Navy Reserve manning and programs to enhance the present system.

The conclusions are that it is possible to estimate the number of RRF ships that can be manned by the commercial manning pool existing at any one time. The remainder of the RRF fleet will have to be manned by some other means, probably by a combination of several means. The RRF is a large fleet and requires some form of personnel management.

The recommendations arrived at are to recognize that commercial manning is most desirable and take measures to improve its application to the RRF. Determine how much of the RRF can be manned by commercial means and develop other means to man the rest. Use existing reserve programs to man part of the RRF and develop a civilian reserve to man the remainder. To make each of these programs more effective they have to be accompanied by more effective personnel management practices.

CHAPTER VIII

CONCLUSIONS

The ability to man the entire RRF as part of the necessary surge sealift requirement is doubtful. Having a large RRF without the capabiility to provide crews is having a hollow force. The required resource in the form of mariners with at least the minimum qualifications appears to exist, but the mechanism to match it up with the need doesn't exist. Having a 144 ship RRF fleet with no personnel management would be like having a navy nearly one fourth the size of the U.S. Navy without a Bureau of Personnel. No one would seriously propose that would work, yet the RRF was set up with the expectation that excess mariners from the active Merchant Fleet would by their own instincts gravitate to the RRF like so many lemmings.

The reason for the apparent disparity between what was planned and what happened is that the model used for personnel management of the RRF was not based on short term surge requirement, but on past activations that more closely resembled normal longer term changes in fleet size. In past cases there was time for market and other pressures to move manpower to where it was needed. The short time frame required in activating surge shipping will not allow those forces to naturally gravitate to where the work force is required.

Desert Shield/Desert Storm did validate previous

assumptions about manpower when applied to the longer or sustainment phase of sealift. As time went on more seamen became available. Eventually long term programs to make more mariners available and to produce new ones would have come into play.

Normal commercial manning serves the industry well and should be relied on for manning the RRF to the extent that it can. Desert Shield/Desert Storm lessons learned indicate that the 1990 commercial manpower pool using the commercial process has the capacity to provide crews for 44 ships in the short term. The capacity of commercial manning procedures to provide RRF crews should be monitored and the ships that will be manned using that method identified ahead of time. Those ships whose equipment most closely resembles that found in the commercial Merchant Fleet should be the first priority for manning using normal commercial means.

The first task is to develop the method of determining how much of the RRF can be manned by commercial means. The recent example shows that a fairly small percent of the active workforce was available in the short term with a substantially larger number becoming available at the four to five month point. Since Desert Shield/Desert Storm provides the best data that we are likely to have for the foreseeable future, it should form the basis of future determinations. MARAD, which

constantly tracks this data with the cooperation of the Coast Guard, should try to quantify the number on a periodic basis and decide which ships will be assigned crews from commercial sources.

Existing manning procedures can be enhanced. A substantial number of additional mariners became available a few months after the activation started when the need was firmly established. The labor unions were responsible for finding these additional people from among their retirees and other former seagoing personnel. They have a vested interest in meeting the manning need and the resources to keep track of their own members and should continue to cooperate with the government in times of crises. An effort should be made to plan for the next contingency by working with the unions to identify the additional manning sources ahead of time so that mariners can be available in the early phase of a future activation.

The most obvious difference between the RRF and any other hardware resource that is held in a ready reserve status is that the people to operate the equipment are not pre-assigned to, or trained on the equipment. Some sailing personnel work under conditions where two people fill a billet and they rotate on and off the ship. This is particularly true of senior positions. This rotation of personnel would be nearly impossible for any government agency to track with any accuracy. Unions keep track

of their members as part of their normal course of business and have the talent, resources and procedures to do so. An effort should be made to explore the possibility of having personnel who are on a rotation off their ships, starting with the most senior billets, pre-assigned to RRF ships by their unions.

The portion of the RRF that cannot be manned by normal commercial means will have to be manned by some other means. It is doubtful that any one proposal can solve the entire problem, but collectively several programs can. A Civilian Reserve program, in one of its forms, is a promising option in satisfying this requirement. The programs proposed so far, however, have a common deficiency in that they rely on the normal commercial personnel distribution process that caused problems in the past. To efficiently match manpower with requirements, the individuals have to be pre-assigned to the billets they will fill. Additionally, the value of any training received is greatly enhanced when it is equipment specific. There is the further benefit of crew cohesion, if even a part of the crew trains together.

Efforts to enact the legislation that will protect the jobs of merchant mariners who return to the seagoing profession in a time of mobilization should be continued. This provision is a key element in several individual programs to enhance the manpower available for the RRF.

Existing reserve programs should be revisited and evaluated even if they can man only a small portion of the RRF. Using an existing resource in this manner will reduce the size and therefore, cost of other programs that require initiation.

The system of tracking the manpower pool can be improved upon. The tracking of the unlicensed will be improved in the near future as the Coast Guard fully implements the five year renewal provision for seaman's documents. It is still difficult to obtain accurate data for emergency manning purposes. This is because the systems were designed with other purposes in mind. Navy, MARAD and Coast Guard all presently have databases. A cooperative effort should be made to coordinate this data.

Other options should be pursued, especially the no cost ones like lengthening the activation times on ships where possible. There can be no doubt after the recent experience that there is a problem with manning for the RRF, and it is almost certainly going to get worse. There have been ample studies but little action. Yes, Virginia, there is a Santa Claus - but, No, Virginia, he will not bring crews for your RRF ships.47

Appendix B

SCENARIO I ACTIVE FLEET PROJECTION

U.S. FLAG DATABASE CODES

MSC	Ships under long-term charter to the Military Sealift Command.
NDRF	Ships acquired for the National Defense Reserve Fleet at the end of their commercially active life or transferred from the Ready Reserve Force.
PREPO	Ships assigned to the Afloat Prepositioning Force either through charter or activation from the Ready Reserve Force.
ROS	Ships placed in Reduced Operating Status (ROS-4 and ROS-5).
RRF	Ships acquired for the Ready Reserve Force (RRF-10, -20 and -30).
US	Active U.S. flag commercial fleet.
OUT	Ships not in the active U.S. flag fleet because they have been scrapped, sold foreign, permanently reflagged, out of service (long term layup or under conversion) or not yet built or acquired (e.g., Large Medium Speed RO/RO).
OUTAPL	Ships owned/operated by American President Lines which have been reflagged, or are projected to be reflagged if the Maritime Security Program is not enacted.
OUTIMO	Single-hulled tankers scrapped due to Inter-Governmental Maritime Organization regulations to reduce the likelihood of oil spills.
OUTLYK	Ships owned/operated by carriers other than APL and Sea-Land (e.g., Lykes Bros. Steamship Co., Farrell Lines, or Waterman Steamship Corp.) which have been reflagged, or are projected to be reflagged if the Maritime Security Program is not enacted.
OUTOPA	Single-hulled tankers scrapped due to Oil Pollution Act of 1990 (OPA 90) regulations to reduce the likelihood of oil spills.
OUTSLD	Ships owned/operated by Sea-Land Service which have been reflagged, or are projected to be reflagged if the Maritime Security Program is not enacted.

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: BARGE														
7216995	AMERICAN KESTREL	C8-S-81H	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7225714	AMERICAN VETERAN	C8-S-81B	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7207645	AUSTRAL RAINBOW	C8-S-81B	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7390698	GREEN HARBOUR	C9-S-81D	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7390703	GREEN ISLAND	C9-S-81D	US	US	US	US	US	US	US	OUTLYK	OUT	OUT	OUT	OUT
7366960	GREEN VALLEY	C9-S-81D	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7013769	JEB STUART	FOREST	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7207633	LASH ATLANTICO	C8-S-81H	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366934	ROBERT E. LEE	C9-S-81D	US	US	US	US	US	US	OUTLYK	OUTLYK	OUT	OUT	OUT	OUT
7366958	SAM HOUSTON	C9-S-81D	US	US	US	US	US	US	OUTLYK	OUTLYK	OUT	OUT	OUT	OUT
7366946	STONEWALL JACKSON	C9-S-81D	US	US	US	US	US	US	OUTLYK	OUTLYK	OUT	OUT	OUT	OUT
11 BARGE SHIPS														
TYPE: BREAKBULK														
6916873	CLEVELAND	C5-S-75A	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
6504761	ELIZABETH LYKES	C4-S-66A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6602214	GALVESTON BAY	C4-S-66A	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6707129	GENEVIEVE LYKES	C4-S-66A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7707671	GREEN RIDGE	C3-M-PVT062	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
7707683	GREEN WAVE	C3-M-PVT062	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
6707155	LETITIA LYKES	C4-S-66A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6504797	LOUISE LYKES	C4-S-66A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7529914	NOBLE STAR	C3-M-PVT030	MSC	MSC	MSC	MSC	MSC	MSC	OUT	OUT	OUT	OUT	OUT	OUT
7710733	RAINBOW HOPE	C1-M-122A	US	US	US	US	US	US	US	US	US	US	US	US
6523810	RUTH LYKES	C4-S-66A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6901804	STELLA LYKES	C5-S-75A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6909911	SUE LYKES	C5-S-75A	MSC	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6610106	TAMPA BAY	C4-S-66A	MSC	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
14 BREAKBULK SHIPS														
TYPE: BULK CARRIER														
8026799	ENERGY INDEPENDENCE	C6-S-PVT081	US	US	US	US	US	US	US	US	US	US	US	US
7366714	GOLDEN MONARCH	T8-S-100B	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8300901	LIBERTY SEA	C8-M-F144A	US	US	US	US	US	US	US	US	US	US	OUT	OUT
8500549	LIBERTY SPIRIT	C8-M-F144B	US	US	US	US	US	US	US	US	US	US	US	US
8510647	LIBERTY STAR	C8-M-F144B	US	US	US	US	US	US	US	US	US	US	US	US
8500551	LIBERTY SUN	C8-M-F144B	US	US	US	US	US	US	US	US	US	US	US	US

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: BULK CARRIER														
8311089	LIBERTY WAVE	C8-M-F144A	US	US	US	US	US	US	US	US	US	US	OUT	OUT
8103664	OMI MISSOURI	C6-M-F139B	US	US	US	US	US	US	US	US	US	OUT	OUT	OUT
8103676	OMI SACRAMENTO	C6-M-F139B	US	US	US	US	US	US	US	US	US	US	OUT	OUT
7516993	OVERSEAS HARRIETTE	T4-M-PVT077	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7516967	OVERSEAS MARILYN	T4-M-PVT077	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7821154	PRIDE OF TEXAS	C5-M-129A	US	US	US	US	US	US	US	US	US	US	US	US
7821178	SPIRIT OF TEXAS	C5-M-129A	US	US	US	US	US	US	US	US	US	US	US	US
7821166	STAR OF TEXAS	C5-M-129A	US	US	US	US	US	US	US	US	US	US	US	US
7225855	SUGAR ISLANDER	C7-M-PVT042	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
15 BULK CARRIER SHIPS														
TYPE: BULK ITB														
7391123	CALRICE TRANSPORT		US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7932202	MOKU PAHU/HSTC-1	IB6-MT-PVT044	US	US	US	US	US	US	US	US	US	US	US	US
2 BULK ITB SHIPS														
TYPE: CAR TRANS														
8320779	FAUST	C6-M-PVT085	US	US	US	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
8613188	GREEN BAY	C4-M-PVT060	US	US	US	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
8607749	GREEN LAKE	C4-M-PVT061	US	US	US	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
8600179	MARINE RELIANCE	RELIANCE PVT	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
7518563	NOSAC RANGER	C6-M-PVT040	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUT	OUT	OUT
8606056	OVERSEAS JOYCE	C6-M-PVT078	US	US	US	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
6 CAR TRANS SHIPS														
TYPE: CHEMICAL														
6806444	CHEMICAL PIONEER	PIONEER PVT	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5095749	CHILBAR	T5-S-41A	US	US	US	US	US	US	US	US	US	US	US	US
7023439	MARINE CHEMIST	CHEMIST PVT	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7816549	OMI DYNACHEM	T5-M-PVT107	US	US	US	US	US	US	US	US	US	US	US	US
7022124	OMI STAR	T5-S-PVT105	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7203687	SEA VENTURE	T4-M-PVT002	US	US	US	US	US	US	US	US	US	US	US	US
7412757	SEABULK AMERICA	SEABULK PVT	US	US	US	US	US	US	US	US	US	US	US	US
7319709	VALIANT	VALIANT PVT	MSC	MSC	MSC	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: CHEMICAL														
8 CHEMICAL SHIPS														
TYPE: COASTAL														
7423732	BRAVADO	T1-M-PVT029	MSC	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT
8414518	EASTERN SUN	T1-MT-PVT007	US	US	US	US	US	US	US	US	US	US	US	OUT
7917783	NORTHERN SUN	T1-MT-PVT009	US	US	US	US	US	US	US	US	US	US	US	US
3 COASTAL SHIPS														
TYPE: CONT BB20														
7515339	ADVANTAGE	C4-M-PVT063	MSC	US	US	US	US	US	US	US	US	OUT	OUT	OUT
6415960	CORPUS CHRISTI	C6-S-60C	MSC	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5399066	FRED G	C5-S-37E	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5168998	JAMES LYKES	C5-S-37E	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5173981	JOHN LYKES	C5-S-37E	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5206960	LESLIE LYKES	C5-S-37E	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5225681	MARJORIE LYKES	C5-S-37F	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5171036	VELMA LYKES	C5-S-37E	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8 CONT BB20 SHIPS														
TYPE: CONT BB40														
6026795	ASHLEY LYKES	C5-S-37F	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
1 CONT BB40 SHIPS														
TYPE: CONT MOD														
7224306	SEA-LAND CONSUMER	C7-S-88A	US	US	US	US	US	US	US	US	US	US	OUT	OUT
1 CONT MOD SHIPS														
TYPE: CONT MOD-P														
7204863	EXPORT FREEDOM	C5-S-73B	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: CONT MOD-P														
7306764	EXPORT PATRIOT	C5-S-73B	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7617905	SEA-LAND ENTERPRISE	C8-S-85D	US	US	US	US	US	US	US	US	US	US	US	US
7116315	SEA-LAND NAVIGATOR	C8-S-85C	US	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT
7617890	SEA-LAND PACIFIC	C8-S-85D	US	US	US	US	US	US	US	US	US	US	US	US
7326233	SEA-LAND TRADER	C8-S-85C	US	US	US	US	US	US	US	US	US	OUT	OUT	OUT
6 CONT MOD-P SHIPS														
TYPE: CONT NSS20														
7635933	ARGONAUT	C5-S-73B	US	US	US	US	US	US	US	US	US	US	US	OUT
7802718	KAUAI	C7-S-PVT034	US	US	US	US	US	US	US	US	US	US	US	US
6913259	MANUKAI	C7-S-PVT036	US	US	US	US	US	US	US	US	US	US	US	US
7002071	MANULANI	C7-S-PVT036	US	US	US	US	US	US	US	US	US	US	US	US
7602338	MAUI	C7-S-PVT038	US	US	US	US	US	US	US	US	US	US	US	US
9002037	R.J. PFEIFFER	PFEIFFER PVT	US	US	US	US	US	US	US	US	US	US	US	US
7635945	RESOLUTE	C5-S-73B	US	US	US	US	US	US	US	US	US	US	US	US
7 CONT NSS20 SHIPS														
TYPE: CONT NSS40														
6903060	ADABELLE LYKES	C6-M-F147A	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7042485	CAROLINA	C7-S-68E	US	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT
6821676	CHARLOTTE LYKES	C6-M-F147A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8212647	GALVESTON BAY	C9-M-F141A	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
6916861	GUAYAMA	C7-S-68E	US	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT
7232420	HOWELL LYKES	C6-S-85B	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6708379	HUMACAO	C7-S-68C	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7320409	JEAN LYKES	C6-S-85B	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6823143	MARGARET LYKES	C6-M-F147A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6828624	MAYAGUEZ	C7-S-68D	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8212611	NEDLLOYD HOLLAND	C9-M-F141A	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
8212714	NEWARK BAY	C9-M-F141A	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7026259	NUEVO SAN JUAN	C7-S-68E	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT
8212673	OOCL INNOVATION	C9-M-F141A	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
8212702	OOCL INSPIRATION	C9-M-F141A	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8616934	PRESIDENT ADAMS	C9-M-F150A	US	US	US	US	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL
8413277	PRESIDENT ARTHUR	C9-M-F151A	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
8413289	PRESIDENT BUCHANAN	C9-M-F151A	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
7819369	PRESIDENT EISENHOWER	C9-M-F148A	US	US	US	US	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL
7819371	PRESIDENT F. D. ROOSEVELT	C9-M-F148A	US	US	US	US	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: CONT NSS40														
8415952	PRESIDENT GARFIELD	C9-M-F151A	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
7114185	PRESIDENT GRANT	C8-S-F81E	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8413239	PRESIDENT HARDING	C9-M-F151A	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
7117670	PRESIDENT HARRISON	C8-S-F81E	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7105471	PRESIDENT HOOVER	C8-S-F81E	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8616300	PRESIDENT JACKSON	C9-M-F150A	US	US	US	US	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL
7224904	PRESIDENT JEFFERSON	C6-S-85B	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8616295	PRESIDENT KENNEDY	C9-M-F150A	US	US	US	US	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL
7907984	PRESIDENT LINCOLN	C9-M-132B	US	US	US	US	US	US	US	US	US	US	US	US
7908005	PRESIDENT MONROE	C9-M-132B	US	US	US	US	US	US	US	US	US	US	US	US
8616922	PRESIDENT POLK	C9-M-F150A	US	US	US	US	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL
8616283	PRESIDENT TRUMAN	C9-M-F150A	US	US	US	US	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL
7125316	PRESIDENT TYLER	C8-S-F81E	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7907996	PRESIDENT WASHINGTON	C9-M-132B	US	US	US	US	US	US	US	US	US	US	US	US
8419142	SEA-LAND ANCHORAGE	C7-M-PVT021	US	US	US	US	US	US	US	US	US	US	US	US
8212685	SEA-LAND ATLANTIC	C9-M-F141A	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
6812211	SEA-LAND CHALLENGER	C7-S-68C	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6905252	SEA-LAND CRUSADER	C7-S-68D	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7820966	SEA-LAND DEFENDER	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUT	OUT	OUT	OUT
7820904	SEA-LAND DEVELOPER	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUT	OUT	OUT	OUT
6820579	SEA-LAND DISCOVERY	C7-S-68D	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7820849	SEA-LAND ENDURANCE	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7218462	SEA-LAND EXPEDITION	C6-S-85A	US	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT
7820930	SEA-LAND EXPLORER	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7820978	SEA-LAND EXPRESS	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7820954	SEA-LAND FREEDOM	C9-M-PVT019	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUT	OUT	OUT	OUT
7233278	SEA-LAND HAWAII	C6-S-85A	US	US	US	US	US	US	US	US	US	OUT	OUT	OUT
7820942	SEA-LAND INDEPENDENCE	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7820851	SEA-LAND INNOVATOR	C9-M-PVT019	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
8212659	SEA-LAND INTEGRITY	C9-M-F141A	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
8419166	SEA-LAND KODIAK	C7-M-PVT021	US	US	US	US	US	US	US	US	US	US	US	US
7820928	SEA-LAND LIBERATOR	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUT	OUT	OUT	OUT
7820980	SEA-LAND MARINER	C9-M-PVT019	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUT	OUT	OUT	OUT
8212623	SEA-LAND MOTIVATOR	C9-M-F141A	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7714349	SEA-LAND PACER	C6-M-PVT020	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7820899	SEA-LAND PATRIOT	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
8212726	SEA-LAND PERFORMANCE	C9-M-F141A	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
8212661	SEA-LAND PRIDE	C9-M-F141A	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7366312	SEA-LAND PRODUCER	C7-S-88A	US	US	US	US	US	US	US	US	US	US	OUT	OUT
8212697	SEA-LAND QUALITY	C9-M-F141A	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7729461	SEA-LAND RELIANCE	C9-S-81F	US	US	US	US	US	US	US	US	US	US	US	US
6728147	SEA-LAND SHINING STAR	C6-S-69C	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7729459	SEA-LAND SPIRIT	C9-S-81F	US	US	US	US	US	US	US	US	US	US	US	US
8419154	SEA-LAND TACOMA	C7-M-PVT021	US	US	US	US	US	US	US	US	US	US	US	US

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: CONT NSS40														
8212635	SEA-LAND VALUE	C9-M-F141A	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7820916	SEA-LAND VOYAGER	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
6828612	SHELDON LYKES	C6-M-F147A	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7328621	THOMPSON LYKES	C6-S-85B	US	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT
8200711	TILLIE LYKES	C6-M-F146A	US	US	US	US	US	US	US	US	US	US	US	US
8200709	TYSON LYKES	C6-M-F146A	US	US	US	US	US	US	US	US	US	US	US	US
70 CONT NSS40 SHIPS														
TYPE: CONT RO/RO														
7321087	LURLINE	C8-S-PVT035	US	US	US	US	US	US	US	US	US	US	US	US
7334204	MATSONIA	C8-S-PVT037	US	US	US	US	US	US	US	US	US	US	US	US
7361180	MV LTC CALVIN P. TITUS	C7-M-F145A	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7361233	MV SP5 ERIC G. GIBSON	C7-M-F145A	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
8320559	SEA FOX	C7-M-F145A	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
8322789	SEA LION	C7-M-F145A	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OTULYK
8320547	SEA WOLF	C7-M-F145A	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
7 CONT RO/RO SHIPS														
TYPE: CRUDE														
7500877	ARCO ALASKA	T9-S-PVT015	US	US	US	US	US	US	US	US	US	US	OUT	OUT
7500889	ARCO CALIFORNIA	T9-S-PVT015	US	US	US	US	US	US	US	US	US	US	US	OUT
7320394	ARCO TEXAS	T8-S-PVT012	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7376915	BRIDGETON	T11-S-PVT004	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7434341	BROOKS RANGE	T8-S-PVT031	US	US	US	US	US	US	US	US	US	OUT	OUT	OUT
7924968	CHESAPEAKE CITY	T7-M-PVT005	US	US	US	US	US	US	US	US	US	US	US	US
7391240	CHEVRON LOUISIANA	T5-GE-PVT026	US	US	US	US	US	US	US	US	US	US	US	US
7367469	CHEVRON OREGON	T5-GE-PVT026	US	US	US	US	US	US	US	US	US	US	US	US
7924970	OCEAN CITY	T7-M-PVT005	US	US	US	US	US	US	US	US	US	US	US	US
7924918	SEA ISLE CITY	T7-M-PVT006	US	US	US	US	US	US	US	US	US	US	US	US
8109682	SEA RIVER BAYTOWN	T7-S-PVT088	US	US	US	US	US	US	US	US	US	US	US	US
7434377	SEA RIVER BENICIA	T8-S-PVT089	US	US	US	US	US	US	US	US	US	US	US	US
8414532	SEA RIVER LONG BEACH	T9-M-PVT093	US	US	US	US	US	US	US	US	US	US	OUT	OUT
8414520	SEA RIVER MEDITERRANEAN	T9-M-PVT093	US	US	US	US	US	US	US	US	US	US	US	US
7434365	SEA RIVER NORTH SLOPE	T8-S-PVT089	US	US	US	US	US	US	US	US	US	US	OUT	OUT
5357599	TEXAS SUN	T6-S-PVT011	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
16 CRUDE SHIPS														

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: FLO/FLO														
7388712	AMERICAN CORMORANT	C6-M-PVT043	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
1 FLO/FLO SHIPS														
TYPE: LIQUID ITB														
8001189	BALTIMORE/BALTIMORE	IB6-MT-PVT018	US	US	US	US	US	US	US	US	US	OUT	OUT	OUT
7209447	CONSTITUTION/OCEAN 280	IB6-MT-PVT120	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8202991	ENERGY ALTAIR/ENERGY AMMONIA	IB4-MT-PVT003	US	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT
7821221	FRANCES HAMMER/OXY 4103	IB6-MT-130A	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT
7901928	GROTON/GROTON	IB6-MT-PVT018	US	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT
7901916	JACKSONVILLE/JACKSONVILLE	IB6-MT-PVT018	US	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT
7821207	JULIUS HAMMER/OXY 4101	IB6-MT-130A	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT
8001206	MOBILE/MOBILE	IB6-MT-PVT018	US	US	US	US	US	US	US	US	US	US	OUT	OUT
7926540	NEW YORK/NEW YORK	IB6-MT-PVT018	US	US	US	US	US	US	US	US	US	OUT	OUT	OUT
8001191	PHILADELPHIA/PHILADELPHIA	IB6-MT-PVT018	US	US	US	US	US	US	US	US	US	US	OUT	OUT
7366491	SEABULK CHALLENGER/STL39	IB6-MT-PVT120	US	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA
7427453	SEABULK MAGNACHEM/SCC390	IB6-MT-PVT120	US	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA
12 LIQUID ITB SHIPS														
TYPE: LMSR														
L0001	LMSR-CV-PREPO 1(SHUGART)	LMSR	OUT	OUT	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0002	LMSR-CV-PREPO 2(GORDON)	LMSR	OUT	OUT	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0003	LMSR-CV-PREPO 3(YANO)	LMSR	OUT	OUT	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0004	LMSR-CV-PREPO 4(GILLILAND)	LMSR	OUT	OUT	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0005	LMSR-CV-PREPO 5(SODERMAN)	LMSR	OUT	OUT	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0006	LMSR-NB-PREPO 6(BOB HOPE)	LMSR	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
L0007	LMSR-NB-PREPO 7	LMSR	OUT	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
L0008	LMSR-NB-PREPO 8	LMSR	OUT	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
L0009	LMSR-NB-ROS 1	LMSR	OUT	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
L0010	LMSR-NB-ROS 2	LMSR	OUT	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
L0011	LMSR-NB-ROS 3	LMSR	OUT	OUT	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
L0012	LMSR-NB-ROS 4	LMSR	OUT	OUT	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
L0013	LMSR-NB-ROS 5	LMSR	OUT	OUT	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
13 LMSR SHIPS														

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: LNG														
7390181	LNG AQUARIUS	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
7390193	LNG ARIES	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
7390208	LNG CAPRICORN	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
7390143	LNG GEMINI	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
7390155	LNG LEO	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
7413232	LNG LIBRA	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
7390167	LNG TAURUS	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
7390179	LNG VIRGO	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
8 LNG SHIPS														
TYPE: MSC														
OUT	N0020	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	USNS P	T-AGS	T-AGS
OUT	N0021	OUT	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	USNS S	T-AGS	T-AGS
OUT	N0025	OUT	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	USNS I	T-AGOS	T-AGOS
OUT	N0110	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	USNS E	T-AGOS	T-AGOS
4 MSC SHIPS														
TYPE: OUT														
OUT	1000107	OUT	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	APL-NB	C9-M-F	CONT N
OUT	1000108	OUT	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	APL-NB	C9-M-F	CONT N
OUT	1000109	OUT	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTPAL	OUTAPL	OUTAPL	OUTAPL	APL-NB	C9-M-F	CONT N
OUT	1111101	OUT	US	US	US	US	US	US	US	US	US	DBL EA	T5-M-P	PRODUC
OUT	1111102	OUT	US	US	US	US	US	US	US	US	US	DBL EA	T5-M-P	PRODUC
OUT	1111103	OUT	OUT	US	US	US	US	US	US	US	US	DBL EA	T5-M-P	PRODUC
OUT	1111104	OUT	OUT	US	US	US	US	US	US	US	US	DBL EA	T5-M-P	PRODUC
OUT	1111105	OUT	OUT	OUT	US	US	US	US	US	US	US	DBL EA	T5-M-P	PRODUC
OUT	1111106	OUT	OUT	OUT	US	US	US	US	US	US	US	DBL EA	T5-M-P	PRODUC
OUT	5215272	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	MARINE	T2-SE-	SULPHU
OUT	5270208	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	MARINE	T2-SE-	SULPHU
OUT	9900099	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	HEAVY	C6-M-P	FLD/FL
OUT	N0030	OUT	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	USNS B	T-AGS	T-AGS
OUT	N0031	OUT	OUT	OUT	MSC	MSC	MSC	MSC	MSC	MSC	MSC	USNS H	T-AGS	T-AGS
14 OUT SHIPS														

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: OUTAPL														
OUT	1000101	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	APL-NB	C9-M-F	CONT N
OUT	1000102	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	APL-NB	C9-M-F	CONT N
OUT	1000103	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	APL-NB	C9-M-F	CONT N
OUT	1000104	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	APL-NB	C9-M-F	CONT N
OUT	1000105	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	APL-NB	C9-M-F	CONT N
OUT	1000106	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	APL-NB	C9-M-F	CONT N
6 OUTAPL SHIPS														
TYPE: OUTLYK														
OUT	1000201	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	LYKES-	C6-M-F	CONT N
OUT	1000202	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	LYKES-	C6-M-F	CONT N
OUT	1000203	OUT	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	LYKES-	C6-M-F	CONT N
OUT	1000204	OUT	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	LYKES-	C6-M-F	CONT N
4 OUTLYK SHIPS														
TYPE: OUTSLD														
OUT	1000301	OUT	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	SEA-LA	C9-M-P	CONT N
OUT	1000302	OUT	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	SEA-LA	C9-M-P	CONT N
OUT	1000303	OUT	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	SEA-LA	C9-M-P	CONT N
OUT	1000304	OUT	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	SEA-LA	C9-M-P	CONT N
4 OUTSLD SHIPS														
TYPE: PAX														
5078882	CONSTITUTION	P3-S2-DL2	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5160180	INDEPENDENCE	P3-S2-DL2	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
2 PAX SHIPS														
TYPE: PRODUCT														
7109439	ADMIRALTY BAY	ASPEN	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390480	AMERICAN HERITAGE	T8-S-100B	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5137860	AMERICAN OSPREY (OPDS 2)	CHESAPEAKE	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7318896	ARCO ANCHORAGE	T8-S-PVT014	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: PRODUCT														
7366300	ARCO FAIRBANKS	T8-S-PVT014	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390076	ARCO INDEPENDENCE	T10-S-101B	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7366295	ARCO JUNEAU	T8-S-PVT014	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7117149	ARCO PRUDHOE BAY	T7-S-PVT013	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7205934	ARCO SAG RIVER	T7-S-PVT013	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390064	ARCO SPIRIT	T10-S-101B	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5267990	BALTIMORE TRADER	T7-M-PVT065	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7908172	BLUE RIDGE	T5-S-PVT115A	US	US	US	US	US	US	US	US	US	US	US	US
5073155	CHARLESTON	T5-S-PVT109	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7366685	CHELSEA	T6-S-93A	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA
7366673	CHERRY VALLEY	T6-S-93A	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA
8008917	CHESAPEAKE TRADER	T5-M-PVT066	US	US	US	US	US	US	US	US	US	US	US	US
7423378	CHESTNUT HILL	T8-S-100B	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7392036	CHEVRON ARIZONA	T5-GE-PVT026	US	US	US	US	US	US	US	US	US	US	US	US
7218967	CHEVRON CALIFORNIA	T7-S-PVT027	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7391238	CHEVRON COLORADO	T5-GE-PVT026	US	US	US	US	US	US	US	US	US	US	US	US
7226914	CHEVRON MISSISSIPPI	T7-S-PVT027	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7391226	CHEVRON WASHINGTON	T5-GE-PVT026	US	US	US	US	US	US	US	US	US	US	US	US
7908184	COAST RANGE	T5-S-PVT115B	US	US	US	US	US	US	US	US	US	US	US	US
5106952	COASTAL CORPUS CHRISTI	T7-S-PVT069	US	US	US	US	US	US	US	US	US	US	US	US
5106902	COASTAL EAGLE POINT	T7-S-PVT069	US	US	US	US	US	US	US	US	US	US	US	US
5137949	COASTAL MANATEE	T7-S-PVT069	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5357056	COASTAL NEW YORK	T6-S-PVT071	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5361356	COLORADO	T6-SE-PVT110	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5050048	CONCHO	T5-SE-PVT111	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7326269	CORONADO	T6-S-93A	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390595	COURIER	T6-M-98A	US	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	OUTOPA	OUTOPA
7109013	COVE ENDEAVOR	T8-S-PVT024	US	US	US	US	US	US	US	US	US	US	US	US
5081619	COVE LIBERTY	T8-S-PVT024	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8008929	DELAWARE TRADER	T5-M-PVT066	US	US	US	US	US	US	US	US	US	US	US	US
7047435	DUCHESS	T5-M-PVT101	US	MSC	MSC	MSC	MSC	MSC	MSC	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
8101642	FALCON CHAMPION	T6-M-136A	US	US	US	US	US	US	US	US	US	US	US	US
7121322	FALCON COUNTESS	T5-M-PVT101	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7205960	FALCON PRINCESS	T5-M-PVT101	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5095713	FREDERICKSBURG	T5-S-PVT082	US	US	US	US	US	US	US	US	US	US	US	US
7017985	GLACIER BAY	ASPEN	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7366702	GOLDEN ENDEAVOR	T8-S-100B	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7022760	GOLDEN GATE	T7-S-PVT080	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5424079	GUADALUPE	T6-SE-PVT112	US	US	US	US	US	US	US	US	US	US	US	OUTOPA
8220761	GUS W. DARNELL	T5-M-PVT022	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
5186158	KEYSTONER	T3-S-PVT079	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7423380	KITTANNING	T8-S-100B	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5137779	KNIGHT	T6-S-PVT071	US	US	OUT	US	US	US	US	US	US	US	US	US
8314158	LAWRENCE H. GIANELLA	T5-M-PVT022	PREPO	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: PRODUCT														
7390466	LIBERTY BELLE	T8-S-100B	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5116957	LION OF CALIFORNIA	T2-S-PVT108	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6716742	MARINE PRINCESS	PRINCESS PVT	US	US	US	US	US	US	US	US	US	US	US	US
7390557	MORMACSKY	T6-S-93A	US	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA
7390533	MORMACSTAR	T6-S-93A	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA
7390545	MORMACSUN	T6-S-93A	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA
5142085	NECHES	T5-SE-PVT113	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7728716	NEW YORK SUN	T5-M-PVT008	US	US	US	US	US	US	US	US	US	US	US	US
6924595	OMI CHAMPION	T5-S-PVT104	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6921311	OMI CHARGER	T5-S-PVT104	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7816551	OMI HUDSON	T5-M-PVT107	US	US	US	US	US	US	US	US	US	US	US	US
6905276	OMI LEADER	T5-S-PVT104	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6909961	OMI WABASH	T5-S-PVT104	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6901969	OMI WILLAMETTE	T5-S-PVT104	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7025487	OVERSEAS ALASKA	T7-S-PVT074	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6810005	OVERSEAS ALICE	T5-S-PVT076	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390492	OVERSEAS CHICAGO	T8-S-100B	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7329998	OVERSEAS JUNEAU	T8-S-PVT072	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7932422	OVERSEAS NEW ORLEANS	T5-M-PVT075	US	US	US	US	US	US	US	US	US	US	US	US
7390519	OVERSEAS NEW YORK	T8-S-100B	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390507	OVERSEAS OHIO	T8-S-100B	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7932410	OVERSEAS PHILADELPHIA	T5-M-PVT075	US	US	US	US	US	US	US	US	US	US	US	US
6814180	OVERSEAS VALDEZ	T5-S-PVT076	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6823492	OVERSEAS VIVIAN	T5-S-PVT076	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390521	OVERSEAS WASHINGTON	T8-S-100B	US	US	US	US	US	US	US	US	US	US	US	US
7390569	PATRIOT	T6-M-98A	US	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	OUTOPA	OUTOPA
8220773	PAUL BUCK	T5-M-PVT022	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
7728704	PHILADELPHIA SUN	T5-M-PVT008	US	US	US	US	US	US	US	US	US	US	US	US
6504694	POTOMAC (OPDS 1)	T5-S-12A	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
8008931	POTOMAC TRADER	T5-M-PVT066	US	US	US	US	US	US	US	US	US	US	US	US
7390571	RANGER	T6-M-98A	US	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA
8310102	RICHARD G. MATTHIESEN	T5-M-PVT022	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
6618213	RIVERHEAD SPIRIT	T5-S-PVT100	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390583	ROVER	T6-M-98A	US	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA
5166483	SABINE	T5-S-PVT115	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
8310097	SAMUEL L. COBB	T5-M-PVT022	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
7012832	SEA RIVER BATON ROUGE	T8-S-PVT087	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
8109668	SEA RIVER CHARLESTON	T5-M-PVT090	US	US	US	US	US	US	US	US	US	US	US	US
7046168	SEA RIVER GALVESTON	T3-MT-PVT091	US	US	US	US	US	US	US	US	US	US	US	OUTOPA
5107683	SEA RIVER JAMESTOWN	T5-S-PVT082	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6506305	SEA RIVER NEW ORLEANS	T7-S-PVT096	US	US	US	US	US	US	US	US	US	US	US	US
7016618	SEA RIVER PHILADELPHIA	T7-S-PVT095	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7017715	SEA RIVER SAN FRANCISCO	T7-S-PVT096	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
8109670	SEA RIVER WILMINGTON	T5-M-PVT090	US	US	US	US	US	US	US	US	US	US	US	US

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: PRODUCT														
7390090	SEALIFT ANTARCTIC	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366764	SEALIFT ARABIAN SEA	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7390088	SEALIFT ARCTIC	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366348	SEALIFT ATLANTIC	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366350	SEALIFT CARIBBEAN	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366776	SEALIFT CHINA SEA	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366788	SEALIFT INDIAN OCEAN	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366336	SEALIFT MEDITERRANEAN	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366752	SEALIFT PACIFIC	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5238274	SEMINOLE	T6-S-F93A	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7908196	SIERRA MADRE	T5-S-PVT115B	US	US	US	US	US	US	US	US	US	US	US	US
5137901	SOLAR	T6-S-PVT071	US	US	US	OUT	US	US	US	US	US	US	US	US
5137913	SPRAY	T6-S-PVT071	US	US	US	US	OUT	US	US	US	US	US	US	US
6404832	STAR GEORGIA	T4-S-PVT102	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5357173	STAR MASSACHUSETTS	T4-S-PVT102	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6418754	STAR RHODE ISLAND	T4-S-PVT102	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5108742	TEXAS TRADER	T5-S-PVT068	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5137872	TROPIC SUN	T5-S-PVT010	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
110 PRODUCT SHIPS														
TYPE: RO/RO														
7702059	1ST LT. ALEXANDER BONNYMAN	C8-M-PVT119	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
8302442	1ST LT. BALDOMERO LOPEZ	C7-M-PVT028	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
8302454	1ST LT. JACK LUMMUS	C7-M-PVT028	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
8219384	2ND LT. JOHN P. BOBO	C7-M-PVT028	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
7920390	AMBASSADOR	C4-M-PVT099	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7909970	AMERICAN CONDOR	C6-M-PVT045	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
7909982	AMERICAN FALCON	C6-M-PVT045	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
7504639	AMERICAN MERLIN	CGM MONET	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7504627	BUFFALO SOLDIER	CGM MONET	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7310911	CAPE DECISION	CAPE D	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7228089	CAPE DOUGLAS	CAPE D	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7724083	CAPE HENRY	CAPE H	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7704942	CAPE HORN	CAPE H	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7704930	CAPE HUDSON	CAPE H	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7826178	CAPE WASHINGTON	CAPE W	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
7826166	CAPE WRATH	CAPE W	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
7702047	CPL. LOUIS J. HAUGE JR.	C8-M-PVT119	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
7420493	GREAT LAND	C8-S-PVT016	US	US	US	US	US	US	US	US	US	US	US	US
7506015	KAIMOKU	C8-S-PVT032	US	US	US	US	US	US	US	US	US	US	US	US
7367445	KAINALU	C8-S-PVT033	US	US	US	US	US	US	US	US	US	US	US	US

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: RO/RO														
7717171	MAERSK CONSTELLATION	C5-M-PVT118	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
7912123	MAJOR STEPHEN W. PLESS	C7-S-133A	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
7395351	NORTHERN LIGHTS	C7-S-PVT017	US	US	US	US	US	US	US	US	US	US	US	US
8219396	PFC. DEWAYNE T. WILLIAMS	C7-M-PVT028	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
7823463	PFC. EUGENE A. OBREGON	C7-S-133A	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
7702035	PFC. JAMES ANDERSON, JR.	C8-M-PVT119	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
7702023	PFC. WILLIAM B. BAUGH	C8-M-PVT119	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
6804434	PONCE	C8-S-PVT058	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7717169	PVT. FRANKLIN J. PHILLIPS	C8-M-PVT119	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
8026048	SENATOR	C4-M-PVT099	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7802706	SGT. MATEJ KOCAK	C7-S-133A	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
8302466	SGT. WILLIAM R. BUTTON	C7-M-PVT028	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
7528130	STRONG TEXAN	C1-M-PVT001	MSC	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8300200	STRONG VIRGINIAN	VIRGINIAN PVT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7614915	WESTWARD VENTURE	C8-S-PVT016	US	US	US	US	US	US	US	US	US	US	US	US
35 RO/RO SHIPS														
TYPE: RO/RO ITB														
7634331	STRONG/AMERICAN	IB5-MT-121A	US	US	US	US	US	US	US	US	US	US	US	US
1 RO/RO ITB SHIPS														
TYPE: SULPHUR														
9077044	SULPHUR ENTERPRISE	T2-SE-A1-C	US	US	US	US	US	US	US	US	US	US	US	US
1 SULPHUR SHIPS														
TYPE: T-AGOS														
N0023	USNS ABLE	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0009	USNS ASSERTIVE	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0017	USNS AUDACIOUS	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0018	USNS BOLD	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0019	USNS CAPABLE	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0012	USNS INDOMITABLE	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0002	USNS INVINCIBLE	T-AGOS	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
N0024	USNS LOYAL	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0006	USNS PERSISTENT	T-AGOS	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: T-AGOS														
N0007	USNS PREVAIL	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0010	USNS STALWART	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0011	USNS TENACIOUS	T-AGOS	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
N0022	USNS VICTORIOUS	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
13 T-AGOS SHIPS														
TYPE: T-AGS														
N0003	USNS JOHN MCDONNELL	T-AGS 51	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0004	USNS KANE	T-AGS 27	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0005	USNS LITTLEHALES	T-AGS 52	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0008	USNS SILAS BENT	T-AGS 26	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0015	USNS WILKES	T-AGS 33	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0016	USNS WYMAN	T-AGS 34	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
6 T-AGS SHIPS														
TYPE: TACS														
7226689	GOPHER STATE (TACS 4)	C5-S-MA73C	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
1 TACS SHIPS														
TYPE: TRAWLER														
7710721	ISLAND ENTERPRISE	C1-M-122A	US	US	US	US	US	US	US	US	US	US	US	US
7710745	STELLAR SEA	C1-M-122A	US	US	US	US	US	US	US	US	US	US	US	US
2 TRAWLER SHIPS														
TYPE: US														
OUT	5137767	OUT	US	US	US	US	US	US	US	US	US	KING	T6-S-P	PRODUC
OUT	7034311	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OVERSE	T7-S-P	PRODUC
OUT	7118222	OUT	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	ASPEN	ASPEN	PRODUC
OUT	8602775	US	US	US	US	US	US	US	US	US	US	FIDELI	C6-M-P	CAR TR
4 US SHIPS														

416 SHIPS IN SCENARIO I

Appendix C

SCENARIO II ACTIVE FLEET PROJECTION

U.S. FLAG DATABASE CODES

MSC	Ships under long-term charter to the Military Sealift Command.
NDRF	Ships acquired for the National Defense Reserve Fleet at the end of their commercially active life or transferred from the Ready Reserve Force.
PREPO	Ships assigned to the Afloat Prepositioning Force either through charter or activation from the Ready Reserve Force.
ROS	Ships placed in Reduced Operating Status (ROS-4 and ROS-5).
RRF	Ships acquired for the Ready Reserve Force (RRF-10, -20 and -30).
US	Active U.S. flag commercial fleet.
OUT	Ships not in the active U.S. flag fleet because they have been scrapped, sold foreign, permanently reflagged, out of service (long term layup or under conversion) or not yet built or acquired (e.g., Large Medium Speed RO/RO).
OUTAPL	Ships owned/operated by American President Lines which have been reflagged, or are projected to be reflagged if the Maritime Security Program is not enacted.
OUTIMO	Single-hulled tankers scrapped due to Inter-Governmental Maritime Organization regulations to reduce the likelihood of oil spills.
OUTLYK	Ships owned/operated by carriers other than APL and Sea-Land (e.g., Lykes Bros. Steamship Co., Farrell Lines, or Waterman Steamship Corp.) which have been reflagged, or are projected to be reflagged if the Maritime Security Program is not enacted.
OUTOPA	Single-hulled tankers scrapped due to Oil Pollution Act of 1990 (OPA 90) regulations to reduce the likelihood of oil spills.
OUTSLD	Ships owned/operated by Sea-Land Service which have been reflagged, or are projected to be reflagged if the Maritime Security Program is not enacted.

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: BARGE														
7216995	AMERICAN KESTREL	C8-S-81H	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7225714	AMERICAN VETERAN	C8-S-81B	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7207645	AUSTRAL RAINBOW	C8-S-81B	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7390698	GREEN HARBOUR	C9-S-81D	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7390703	GREEN ISLAND	C9-S-81D	US	US	US	US	US	US	US	OUTLYK	OUT	OUT	OUT	OUT
7366960	GREEN VALLEY	C9-S-81D	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7013769	JEB STUART	FOREST	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7207633	LASH ATLANTICO	C8-S-81H	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366934	ROBERT E. LEE	C9-S-81D	US	US	US	US	US	US	OUTLYK	OUTLYK	OUT	OUT	OUT	OUT
7366958	SAM HOUSTON	C9-S-81D	US	US	US	US	US	US	OUTLYK	OUTLYK	OUT	OUT	OUT	OUT
7366946	STONEWALL JACKSON	C9-S-81D	US	US	US	US	US	US	OUTLYK	OUTLYK	OUT	OUT	OUT	OUT
11 BARGE SHIPS														
TYPE: BREAKBULK														
6916873	CLEVELAND	C5-S-75A	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
6504761	ELIZABETH LYKES	C4-S-66A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6602214	GALVESTON BAY	C4-S-66A	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6707129	GENEVIEVE LYKES	C4-S-66A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7707671	GREEN RIDGE	C3-M-PVT062	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
7707683	GREEN WAVE	C3-M-PVT062	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
6707155	LETITIA LYKES	C4-S-66A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6504797	LOUISE LYKES	C4-S-66A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7529914	NOBLE STAR	C3-M-PVT030	MSC	MSC	MSC	MSC	MSC	MSC	OUT	OUT	OUT	OUT	OUT	OUT
7710733	RAINBOW HOPE	C1-M-122A	US	US	US	US	US	US	US	US	US	US	US	US
6523810	RUTH LYKES	C4-S-66A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6901804	STELLA LYKES	C5-S-75A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6909911	SUE LYKES	C5-S-75A	MSC	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6610106	TAMPA BAY	C4-S-66A	MSC	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
14 BREAKBULK SHIPS														
TYPE: BULK CARRIER														
8026799	ENERGY INDEPENDENCE	C6-S-PVT081	US	US	US	US	US	US	US	US	US	US	US	US
7366714	GOLDEN MONARCH	T8-S-100B	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8300901	LIBERTY SEA	C8-M-F144A	US	US	US	US	US	US	US	US	US	US	OUT	OUT
8500549	LIBERTY SPIRIT	C8-M-F144B	US	US	US	US	US	US	US	US	US	US	US	US
8510647	LIBERTY STAR	C8-M-F144B	US	US	US	US	US	US	US	US	US	US	US	US
8500551	LIBERTY SUN	C8-M-F144B	US	US	US	US	US	US	US	US	US	US	US	US

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: BULK CARRIER														
8311089	LIBERTY WAVE	C8-M-F144A	US	US	US	US	US	US	US	US	US	US	OUT	OUT
8103664	OMI MISSOURI	C6-M-F139B	US	US	US	US	US	US	US	US	US	OUT	OUT	OUT
8103676	OMI SACRAMENTO	C6-M-F139B	US	US	US	US	US	US	US	US	US	US	OUT	OUT
7516993	OVERSEAS HARRIETTE	T4-M-PVT077	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7516967	OVERSEAS MARILYN	T4-M-PVT077	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7821154	PRIDE OF TEXAS	C5-M-129A	US	US	US	US	US	US	US	US	US	US	US	US
7821178	SPIRIT OF TEXAS	C5-M-129A	US	US	US	US	US	US	US	US	US	US	US	US
7821166	STAR OF TEXAS	C5-M-129A	US	US	US	US	US	US	US	US	US	US	US	US
7225855	SUGAR ISLANDER	C7-M-PVT042	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
15 BULK CARRIER SHIPS														
TYPE: BULK ITB														
7391123	CALRICE TRANSPORT		US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7932202	MOKU PAHU/HSTC-1	IB6-MT-PVT044	US	US	US	US	US	US	US	US	US	US	US	US
2 BULK ITB SHIPS														
TYPE: CAR TRANS														
8320779	FAUST	C6-M-PVT085	US	US	US	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
8602775	FIDELIO	C6-M-PVT085	OUT	US	US	US	US	US	US	US	US	US	US	US
8613188	GREEN BAY	C4-M-PVT060	US	US	US	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
8607749	GREEN LAKE	C4-M-PVT061	US	US	US	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
8600179	MARINE RELIANCE	RELIANCE PVT	US	OUTLYK	US	US	US	US	US	US	US	US	US	US
7518563	NOSAC RANGER	C6-M-PVT040	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUT	OUT	OUT
8606056	OVERSEAS JOYCE	C6-M-PVT078	US	US	US	US	US	US	US	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
7 CAR TRANS SHIPS														
TYPE: CHEMICAL														
6806444	CHEMICAL PIONEER	PIONEER PVT	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5095749	CHILBAR	T5-S-41A	US	US	US	US	US	US	US	US	US	US	US	US
7023439	MARINE CHEMIST	CHEMIST PVT	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7816549	OMI DYNACHEM	T5-M-PVT107	US	US	US	US	US	US	US	US	US	US	US	US
7022124	OMI STAR	T5-S-PVT105	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7203687	SEA VENTURE	T4-M-PVT002	US	US	US	US	US	US	US	US	US	US	US	US
7412757	SEABULK AMERICA	SEABULK PVT	US	US	US	US	US	US	US	US	US	US	US	US
7319709	VALIANT	VALIANT PVT	MSC	MSC	MSC	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: CHEMICAL														
8 CHEMICAL SHIPS														
TYPE: COASTAL														
7423732	BRAVADO	T1-M-PVT029	MSC	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT
8414518	EASTERN SUN	T1-MT-PVT007	US	US	US	US	US	US	US	US	US	US	US	OUT
7917783	NORTHERN SUN	T1-MT-PVT009	US	US	US	US	US	US	US	US	US	US	US	US
3 COASTAL SHIPS														
TYPE: CONT BB20														
7515339	ADVANTAGE	C4-M-PVT063	MSC	US	US	US	US	US	US	US	US	OUT	OUT	OUT
6415960	CORPUS CHRISTI	C6-S-60C	MSC	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5399066	FRED G	C5-S-37E	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5168998	JAMES LYKES	C5-S-37E	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5173981	JOHN LYKES	C5-S-37E	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5206960	LESLIE LYKES	C5-S-37E	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5225681	MARJORIE LYKES	C5-S-37F	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5171036	VELMA LYKES	C5-S-37E	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8 CONT BB20 SHIPS														
TYPE: CONT BB40														
6026795	ASHLEY LYKES	C5-S-37F	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
1 CONT BB40 SHIPS														
TYPE: CONT MOD														
7224306	SEA-LAND CONSUMER	C7-S-88A	US	US	US	US	US	US	US	US	US	US	OUT	OUT
1 CONT MOD SHIPS														
TYPE: CONT MOD-P														
7204863	EXPORT FREEDOM	C5-S-73B	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: CONT MOD-P														
7306764	EXPORT PATRIOT	C5-S-73B	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7617905	SEA-LAND ENTERPRISE	C8-S-85D	US	US	US	US	US	US	US	US	US	US	US	US
7116315	SEA-LAND NAVIGATOR	C8-S-85C	US	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT
7617890	SEA-LAND PACIFIC	C8-S-85D	US	US	US	US	US	US	US	US	US	US	US	US
7326233	SEA-LAND TRADER	C8-S-85C	US	US	US	US	US	US	US	US	US	OUT	OUT	OUT
6 CONT MOD-P SHIPS														
TYPE: CONT NSS20														
7635933	APOLLONAUT	C5-S-73B	US	US	US	US	US	US	US	US	US	US	US	OUT
7802718	KAUAI	C7-S-PVT034	US	US	US	US	US	US	US	US	US	US	US	US
6913259	MANUKAI	C7-S-PVT036	US	US	US	US	US	US	US	US	US	US	US	US
7002071	MANULANI	C7-S-PVT036	US	US	US	US	US	US	US	US	US	US	US	US
7602338	MAUI	C7-S-PVT038	US	US	US	US	US	US	US	US	US	US	US	US
9002037	R.J. PFEIFFER	PFEIFFER PVT	US	US	US	US	US	US	US	US	US	US	US	US
7635945	RESOLUTE	C5-S-73B	US	US	US	US	US	US	US	US	US	US	US	US
7 CONT NSS20 SHIPS														
TYPE: CONT NSS40														
6903060	ADABELLE LYKES	C6-M-F147A	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
1000101	APL-NB 1 (APL CHINA)	C9-M-F151A	OUT	OUTAPL	US	US	US	US	US	US	US	US	US	US
1000102	APL-NB 2 (APL JAPAN)	C9-M-F151A	OUT	OUTAPL	US	US	US	US	US	US	US	US	US	US
1000103	APL-NB 3 (APL THAILAND)	C9-M-F151A	OUT	OUTAPL	US	US	US	US	US	US	US	US	US	US
1000104	APL-NB 4 (APL PHILIPPINES)	C9-M-F151A	OUT	OUTAPL	US	US	US	US	US	US	US	US	US	US
1000105	APL-NB 5 (APL SINGAPORE)	C9-M-F151A	OUT	OUTAPL	US	US	US	US	US	US	US	US	US	US
1000106	APL-NB 6 (APL KOREA)	C9-M-F151A	OUT	OUTAPL	US	US	US	US	US	US	US	US	US	US
1000107	APL-NB 7	C9-M-F151A	OUT	OUT	OUT	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL
1000108	APL-NB 8	C9-M-F151A	OUT	OUT	OUT	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL
1000109	APL-NB 9	C9-M-F151A	OUT	OUT	OUT	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL
7042485	CAROLINA	C7-S-68E	US	US	US	US	US	US	US	US	US	US	US	OUT
6821676	CHARLOTTE LYKES	C6-M-F147A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8212647	GALVESTON BAY	C9-M-F141A	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
6916861	GUAYAMA	C7-S-68E	US	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT
7232420	HOWELL LYKES	C6-S-85B	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6708379	HUMACAO	C7-S-68C	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7320409	JEAN LYKES	C6-S-85B	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT
1000201	LYKES-NB 1(JAMES LYKES)	C6-M-F146A-1	OUT	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
1000202	LYKES-NB 2	C6-M-F146A-1	OUT	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
1000203	LYKES-NB 3	C6-M-F146A-1	OUT	OUT	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: CONT NSS40														
1000204	LYKES-NB 4	C6-M-F146A-1	OUT	OUT	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK	OUTLYK
6823143	MARGARET LYKES	C6-M-F147A	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6828624	MAYAGUEZ	C7-S-68D	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8212611	NEDLLOYD HOLLAND	C9-M-F141A	US	US	US	US	US	US	US	US	US	US	US	US
8212714	NEWARK BAY	C9-M-F141A	US	US	US	US	US	US	US	US	US	US	US	US
7026259	NUEVO SAN JUAN	C7-S-68E	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT
8212673	OOCL INNOVATION	C9-M-F141A	US	US	US	US	US	US	US	US	US	US	US	US
8212702	OOCL INSPIRATION	C9-M-F141A	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8616934	PRESIDENT ADAMS	C9-M-F150A	US	US	US	US	US	US	US	US	US	US	US	US
8413277	PRESIDENT ARTHUR	C9-M-F151A	US	US	US	US	US	US	US	US	US	US	US	US
8413289	PRESIDENT BUCHANAN	C9-M-F151A	US	US	US	US	US	US	US	US	US	US	US	US
7819369	PRESIDENT EISENHOWER	C9-M-F148A	US	US	US	US	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL
7819371	PRESIDENT F. D. ROOSEVELT	C9-M-F148A	US	US	US	US	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL	OUTAPL
8415952	PRESIDENT GARFIELD	C9-M-F151A	US	US	US	US	US	US	US	US	US	US	US	US
7114185	PRESIDENT GRANT	C8-S-F81E	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8413239	PRESIDENT HARDING	C9-M-F151A	US	US	US	US	US	US	US	US	US	US	US	US
7117670	PRESIDENT HARRISON	C8-S-F81E	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7105471	PRESIDENT HOOVER	C8-S-F81E	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8616300	PRESIDENT JACKSON	C9-M-F150A	US	US	US	US	US	US	US	US	US	US	US	US
7224904	PRESIDENT JEFFERSON	C6-S-85B	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8616295	PRESIDENT KENNEDY	C9-M-F150A	US	US	US	US	US	US	US	US	US	US	US	US
7907984	PRESIDENT LINCOLN	C9-M-1328	US	US	US	US	US	US	US	US	US	US	US	US
7908005	PRESIDENT MONROE	C9-M-1328	US	US	US	US	US	US	US	US	US	US	US	US
8616922	PRESIDENT POLK	C9-M-F150A	US	US	US	US	US	US	US	US	US	US	US	US
8616283	PRESIDENT TRUMAN	C9-M-F150A	US	US	US	US	US	US	US	US	US	US	US	US
7125316	PRESIDENT TYLER	C8-S-F81E	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7907996	PRESIDENT WASHINGTON	C9-M-1328	US	US	US	US	US	US	US	US	US	US	US	US
8419142	SEA-LAND ANCHORAGE	C7-M-PVT021	US	US	US	US	US	US	US	US	US	US	US	US
8212685	SEA-LAND ATLANTIC	C9-M-F141A	US	US	US	US	US	US	US	US	US	US	US	US
6812211	SEA-LAND CHALLENGER	C7-S-68C	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
6905252	SEA-LAND CRUSADER	C7-S-68D	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7820966	SEA-LAND DEFENDER	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUT	OUT	OUT	OUT
7820904	SEA-LAND DEVELOPER	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUT	OUT	OUT	OUT
6820579	SEA-LAND DISCOVERY	C7-S-68D	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7820849	SEA-LAND ENDURANCE	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7218462	SEA-LAND EXPEDITION	C6-S-85A	US	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT
7820930	SEA-LAND EXPLORER	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7820978	SEA-LAND EXPRESS	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7820954	SEA-LAND FREEDOM	C9-M-PVT019	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUT	OUT	OUT	OUT
7233278	SEA-LAND HAWAII	C6-S-85A	US	US	US	US	US	US	US	US	US	OUT	OUT	OUT
7820942	SEA-LAND INDEPENDENCE	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7820851	SEA-LAND INNOVATOR	C9-M-PVT019	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
8212659	SEA-LAND INTEGRITY	C9-M-F141A	US	US	US	US	US	US	US	US	US	US	US	US
8419166	SEA-LAND KODIAK	C7-M-PVT021	US	US	US	US	US	US	US	US	US	US	US	US

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: CONT NSS40														
7820928	SEA-LAND LIBERATOR	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUT	OUT	OUT	OUT
7820980	SEA-LAND MARINER	C9-M-PVT019	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUT	OUT	OUT	OUT
8212623	SEA-LAND MOTIVATOR	C9-M-F141A	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
1000301	SEA-LAND NB 1	C9-M-PVT019	OUT	OUT	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
1000302	SEA-LAND NB 2	C9-M-PVT019	OUT	OUT	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
1000303	SEA-LAND NB 3	C9-M-PVT019	OUT	OUT	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
1000304	SEA-LAND NB 4	C9-M-PVT019	OUT	OUT	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7714349	SEA-LAND PACER	C6-M-PVT020	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7820899	SEA-LAND PATRIOT	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
8212726	SEA-LAND PERFORMANCE	C9-M-F141A	US	US	US	US	US	US	US	US	US	US	US	US
8212661	SEA-LAND PRIDE	C9-M-F141A	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7366312	SEA-LAND PRODUCER	C7-S-88A	US	US	US	US	US	US	US	US	US	US	OUT	OUT
8212697	SEA-LAND QUALITY	C9-M-F141A	US	US	US	US	US	US	US	US	US	US	US	US
7729461	SEA-LAND RELIANCE	C9-S-81F	US	US	US	US	US	US	US	US	US	US	US	US
6728147	SEA-LAND SHINING STAR	C6-S-69C	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7729459	SEA-LAND SPIRIT	C9-S-81F	US	US	US	US	US	US	US	US	US	US	US	US
8419154	SEA-LAND TACOMA	C7-M-PVT021	US	US	US	US	US	US	US	US	US	US	US	US
8212635	SEA-LAND VALUE	C9-M-F141A	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
7820916	SEA-LAND VOYAGER	C9-M-PVT019	US	US	US	US	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD	OUTSLD
6828612	SHELDON LYKES	C6-M-F147A	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7328621	THOMPSON LYKES	C6-S-85B	US	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT
8200711	TILLIE LYKES	C6-M-F146A	US	US	US	US	US	US	US	US	US	US	US	US
8200709	TYSON LYKES	C6-M-F146A	US	US	US	US	US	US	US	US	US	US	US	US
87 CONT NSS40 SHIPS														
TYPE: CONT RO/RO														
7321087	LURLINE	C8-S-PVT035	US	US	US	US	US	US	US	US	US	US	US	US
7334204	MATSONIA	C8-S-PVT037	US	US	US	US	US	US	US	US	US	US	US	US
7361180	MV LTC CALVIN P. TITUS	C7-M-F145A	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7361233	MV SP5 ERIC G. GIBSON	C7-M-F145A	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
8320559	SEA FOX	C7-M-F145A	US	US	US	US	US	US	US	US	US	US	US	US
8322789	SEA LION	C7-M-F145A	US	US	US	US	US	US	US	US	US	US	US	US
8320547	SEA WOLF	C7-M-F145A	US	US	US	US	US	US	US	US	US	US	US	US
7 CONT RO/RO SHIPS														
TYPE: CRUDE														
7500877	ARCO ALASKA	T9-S-PVT015	US	US	US	US	US	US	US	US	US	US	OUT	OUT
7500889	ARCO CALIFORNIA	T9-S-PVT015	US	US	US	US	US	US	US	US	US	US	US	OUT

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: CRUDE														
7320394	ARCO TEXAS	T8-S-PVT012	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7376915	BRIDGETON	T11-S-PVT004	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7434341	BROOKS RANGE	T8-S-PVT031	US	US	US	US	US	US	US	US	US	OUT	OUT	OUT
7924968	CHESAPEAKE CITY	T7-M-PVT005	US	US	US	US	US	US	US	US	US	US	US	US
7391240	CHEVRON LOUISIANA	T5-GE-PVT026	US	US	US	US	US	US	US	US	US	US	US	US
7367469	CHEVRON OREGON	T5-GE-PVT026	US	US	US	US	US	US	US	US	US	US	US	US
7924970	OCEAN CITY	T7-M-PVT005	US	US	US	US	US	US	US	US	US	US	US	US
7924918	SEA ISLE CITY	T7-M-PVT006	US	US	US	US	US	US	US	US	US	US	US	US
8109682	SEA RIVER BAYTOWN	T7-S-PVT088	US	US	US	US	US	US	US	US	US	US	US	US
7434377	SEA RIVER BENICIA	T8-S-PVT089	US	US	US	US	US	US	US	US	US	US	OUT	OUT
8414532	SEA RIVER LONG BEACH	T9-M-PVT093	US	US	US	US	US	US	US	US	US	US	US	US
8414520	SEA RIVER MEDITERRANEAN	T9-M-PVT093	US	US	US	US	US	US	US	US	US	US	US	US
7434365	SEA RIVER NORTH SLOPE	T8-S-PVT089	US	US	US	US	US	US	US	US	US	US	OUT	OUT
5357599	TEXAS SUN	T6-S-PVT011	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
16 CRUDE SHIPS														
TYPE: FLO/FLO														
7388712	AMERICAN CORMORANT	C6-M-PVT043	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
9900099	HEAVY LIFT SHIP NO. 2	C6-M-PVT043	OUT	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
2 FLO/FLO SHIPS														
TYPE: LIQUID ITB														
8001189	BALTIMORE/BALTIMORE	IB6-MT-PVT018	US	US	US	US	US	US	US	US	US	OUT	OUT	OUT
7209447	CONSTITUTION/OCEAN 280	IB6-MT-PVT120	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8202991	ENERGY ALTAIR/ENERGY AMMONIA	IB4-MT-PVT003	US	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT
7821221	FRANCES HAMMER/OXY 4103	IB6-MT-130A	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT
7901928	GROTON/GROTON	IB6-MT-PVT018	US	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT
7901916	JACKSONVILLE/JACKSONVILLE	IB6-MT-PVT018	US	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT
7821207	JULIUS HAMMER/OXY 4101	IB6-MT-130A	US	US	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT
8001206	MOBILE/MOBILE	IB6-MT-PVT018	US	US	US	US	US	US	US	US	US	US	OUT	OUT
7926540	NEW YORK/NEW YORK	IB6-MT-PVT018	US	US	US	US	US	US	US	US	US	OUT	OUT	OUT
8001191	PHILADELPHIA/PHILADELPHIA	IB6-MT-PVT018	US	US	US	US	US	US	US	US	US	US	OUT	OUT
7366491	SEABULK CHALLENGER/STL39	IB6-MT-PVT120	US	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA
7427453	SEABULK MAGNACHEM/SCC390	IB6-MT-PVT120	US	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA
12 LIQUID ITB SHIPS														

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: LMSR														
L0001	LMSR-CV-PREPO 1(SHUGART)	LMSR	OUT	OUT	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0002	LMSR-CV-PREPO 2(GORDON)	LMSR	OUT	OUT	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0003	LMSR-CV-PREPO 3(YANO)	LMSR	OUT	OUT	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0004	LMSR-CV-PREPO 4(GILLILAND)	LMSR	OUT	OUT	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0005	LMSR-CV-PREPO 5(SODERMAN)	LMSR	OUT	OUT	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0006	LMSR-N8-PREPO 6(BOB HOPE)	LMSR	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
L0007	LMSR-N8-PREPO 7	LMSR	OUT	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
L0008	LMSR-N8-PREPO 8	LMSR	OUT	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
L0009	LMSR-N8-ROS 1	LMSR	OUT	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
L0010	LMSR-N8-ROS 2	LMSR	OUT	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
L0011	LMSR-N8-ROS 3	LMSR	OUT	OUT	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
L0012	LMSR-N8-ROS 4	LMSR	OUT	OUT	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
L0013	LMSR-N8-ROS 5	LMSR	OUT	OUT	OUT	OUT	OUT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
13 LMSR SHIPS														
TYPE: LNG														
7390181	LNG AQUARIUS	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
7390193	LNG ARIES	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
7390208	LNG CAPRICORN	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
7390143	LNG GEMINI	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
7390155	LNG LEO	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
7413232	LNG LIBRA	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
7390167	LNG TAURUS	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
7390179	LNG VIRGO	LG8-S-102A	US	US	US	US	US	US	US	US	US	US	US	US
8 LNG SHIPS														
TYPE: PAX														
5078882	CONSTITUTION	P3-S2-DL2	US	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5160180	INDEPENDENCE	P3-S2-DL2	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
2 PAX SHIPS														
TYPE: PRODUCT														
7109439	ADMIRALTY BAY	ASPEN	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390480	AMERICAN HERITAGE	T8-S-100B	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5137860	AMERICAN OSPREY (OPDS 2)	CHESAPEAKE	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: PRODUCT														
7318896	ARCO ANCHORAGE	T8-S-PVT014	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7366300	ARCO FAIRBANKS	T8-S-PVT014	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390076	ARCO INDEPENDENCE	T10-S-1018	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7366295	ARCO JUNEAU	T8-S-PVT014	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7117149	ARCO PRUDHOE BAY	T7-S-PVT013	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7205934	ARCO SAG RIVER	T7-S-PVT013	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390064	ARCO SPIRIT	T10-S-1018	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7118222	ASPEN	ASPEN	OUT	OUT	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5267990	BALTIMORE TRADER	T7-M-PVT065	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7908172	BLUE RIDGE	T5-S-PVT115A	US	US	US	US	US	US	US	US	US	US	US	US
5073155	CHARLESTON	T5-S-PVT109	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7366685	CHELSEA	T6-S-93A	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA
7366673	CHERRY VALLEY	T6-S-93A	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA
8008917	CHESAPEAKE TRADER	T5-M-PVT066	US	US	US	US	US	US	US	US	US	US	US	US
7423378	CHESTNUT HILL	T8-S-100B	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7392036	CHEVRON ARIZONA	T5-GE-PVT026	US	US	US	US	US	US	US	US	US	US	US	US
7218967	CHEVRON CALIFORNIA	T7-S-PVT027	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7391238	CHEVRON COLORADO	T5-GE-PVT026	US	US	US	US	US	US	US	US	US	US	US	US
7226914	CHEVRON MISSISSIPPI	T7-S-PVT027	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7391226	CHEVRON WASHINGTON	T5-GE-PVT026	US	US	US	US	US	US	US	US	US	US	US	US
7908184	COAST RANGE	T5-S-PVT115B	US	US	US	US	US	US	US	US	US	US	US	US
5106952	COASTAL CORPUS CHRISTI	T7-S-PVT069	US	US	US	US	US	US	US	US	US	US	US	US
5106902	COASTAL EAGLE POINT	T7-S-PVT069	US	US	US	US	US	US	US	US	US	US	US	US
5137949	COASTAL MANATEE	T7-S-PVT069	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5357056	COASTAL NEW YORK	T6-S-PVT071	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5361356	COLORADO	T6-SE-PVT110	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5050048	CONCHO	T5-SE-PVT111	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7326269	CORONADO	T6-S-93A	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390595	COURIER	T6-M-98A	US	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	OUTOPA	OUTOPA
7109013	COVE ENDEAVOR	T8-S-PVT024	US	US	US	US	US	US	US	US	US	US	US	US
5081619	COVE LIBERTY	T8-S-PVT024	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
1111101	DBL EAGLE NB1	T5-M-PVT090	OUT	OUT	OUT	US	US	US	US	US	US	US	US	US
1111102	DBL EAGLE NB2	T5-M-PVT090	OUT	OUT	OUT	US	US	US	US	US	US	US	US	US
1111103	DBL EAGLE NB3	T5-M-PVT090	OUT	OUT	OUT	OUT	US	US	US	US	US	US	US	US
1111104	DBL EAGLE NB4	T5-M-PVT090	OUT	OUT	OUT	OUT	US	US	US	US	US	US	US	US
1111105	DBL EAGLE NB5	T5-M-PVT090	OUT	OUT	OUT	OUT	OUT	US	US	US	US	US	US	US
1111106	DBL EAGLE NB6	T5-M-PVT090	OUT	OUT	OUT	OUT	OUT	US	US	US	US	US	US	US
8008929	DELAWARE TRADER	T5-M-PVT066	US	US	US	US	US	US	US	US	US	US	US	US
7047435	DUCHESS	T5-M-PVT101	US	MSC	MSC	MSC	MSC	MSC	MSC	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
8101642	FALCON CHAMPION	T6-M-136A	US	US	US	US	US	US	US	US	US	US	US	US
7121322	FALCON COUNTESS	T5-M-PVT101	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7205960	FALCON PRINCESS	T5-M-PVT101	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5095713	FREDERICKSBURG	T5-S-PVT082	US	US	US	US	US	US	US	US	US	US	US	US
7017985	GLACIER BAY	ASPEN	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: PRODUCT														
7366702	GOLDEN ENDEAVOR	T8-S-100B	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7022760	GOLDEN GATE	T7-S-PVT080	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5424079	GUADALUPE	T6-SE-PVT112	US	US	US	US	US	US	US	US	US	US	US	OUTOPA
8220761	GUS W. DARNELL	T5-M-PVT022	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
5186158	KEYSTONER	T3-S-PVT079	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5137767	KING	T6-S-PVT071	OUT	OUT	US	US	US	US	US	US	US	US	US	US
7423380	KITTANNING	T8-S-100B	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5137779	KNIGHT	T6-S-PVT071	US	US	OUT	US	US	US	US	US	US	US	US	US
8314158	LAWRENCE H. GIANELLA	T5-M-PVT022	PREPO	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
7390466	LIBERTY BELLE	T8-S-100B	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5116957	LION OF CALIFORNIA	T2-S-PVT108	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6716742	MARINE PRINCESS	PRINCESS PVT	US	US	US	US	US	US	US	US	US	US	US	US
7390557	MORMACSKY	T6-S-93A	US	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA
7390533	MORMACSTAR	T6-S-93A	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA
7390545	MORMACSUN	T6-S-93A	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA
5142085	NECHES	T5-SE-PVT113	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7728716	NEW YORK SUN	T5-M-PVT008	US	US	US	US	US	US	US	US	US	US	US	US
6924595	OMI CHAMPION	T5-S-PVT104	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6921311	OMI CHARGER	T5-S-PVT104	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7816551	OMI HUDSON	T5-M-PVT107	US	US	US	US	US	US	US	US	US	US	US	US
6905276	OMI LEADER	T5-S-PVT104	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6909961	OMI WABASH	T5-S-PVT104	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6901969	OMI WILLAMETTE	T5-S-PVT104	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7025487	OVERSEAS ALASKA	T7-S-PVT074	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6810005	OVERSEAS ALICE	T5-S-PVT076	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7034311	OVERSEAS ARCTIC	T7-S-PVT074	OUT	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390492	OVERSEAS CHICAGO	T8-S-100B	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7329998	OVERSEAS JUNEAU	T8-S-PVT072	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7932422	OVERSEAS NEW ORLEANS	T5-M-PVT075	US	US	US	US	US	US	US	US	US	US	US	US
7390519	OVERSEAS NEW YORK	T8-S-100B	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390507	OVERSEAS OHIO	T8-S-100B	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7932410	OVERSEAS PHILADELPHIA	T5-M-PVT075	US	US	US	US	US	US	US	US	US	US	US	US
6814180	OVERSEAS VALDEZ	T5-S-PVT076	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6823492	OVERSEAS VIVIAN	T5-S-PVT076	US	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390521	OVERSEAS WASHINGTON	T8-S-100B	US	US	US	US	US	US	US	US	US	US	US	US
7390569	PATRIOT	T6-M-98A	US	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	OUTOPA	OUTOPA
8220773	PAUL BUCK	T5-M-PVT022	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
7728704	PHILADELPHIA SUN	T5-M-PVT008	US	US	US	US	US	US	US	US	US	US	US	US
6504694	POTOMAC (OPDS 1)	T5-S-12A	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
8008931	POTOMAC TRADER	T5-M-PVT066	US	US	US	US	US	US	US	US	US	US	US	US
7390571	RANGER	T6-M-98A	US	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA
8310102	RICHARD G. MATTHIESEN	T5-M-PVT022	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
6618213	RIVERHEAD SPIRIT	T5-S-PVT100	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7390583	ROVER	T6-M-98A	US	US	US	US	US	US	US	US	US	US	OUTOPA	OUTOPA

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: PRODUCT														
5166483	SABINE	T5-S-PVT115	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
8310097	SAMUEL L. COBB	T5-M-PVT022	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
7012832	SEA RIVER BATON ROUGE	T8-S-PVT087	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
8109668	SEA RIVER CHARLESTON	T5-M-PVT090	US	US	US	US	US	US	US	US	US	US	US	US
7046168	SEA RIVER GALVESTON	T3-MT-PVT091	US	US	US	US	US	US	US	US	US	US	US	OUTOPA
5107683	SEA RIVER JAMESTOWN	T5-S-PVT082	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6506305	SEA RIVER NEW ORLEANS	T7-S-PVT096	US	US	US	US	US	US	US	US	US	US	US	US
7016618	SEA RIVER PHILADELPHIA	T7-S-PVT095	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7017715	SEA RIVER SAN FRANCISCO	T7-S-PVT096	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
8109670	SEA RIVER WILMINGTON	T5-M-PVT090	US	US	US	US	US	US	US	US	US	US	US	US
7390090	SEALIFT ANTARCTIC	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366764	SEALIFT ARABIAN SEA	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7390088	SEALIFT ARCTIC	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366348	SEALIFT ATLANTIC	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366350	SEALIFT CARIBBEAN	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366776	SEALIFT CHINA SEA	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366788	SEALIFT INDIAN OCEAN	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366336	SEALIFT MEDITERRANEAN	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7366752	SEALIFT PACIFIC	T4-M-PVT086	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5238274	SEMINOLE	T6-S-F93A	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
7908196	SIERRA MADRE	T5-S-PVT1158	US	US	US	US	US	US	US	US	US	US	US	US
5137901	SOLAR	T6-S-PVT071	US	US	US	OUT	US	US	US	US	US	US	US	US
5137913	SPRAY	T6-S-PVT071	US	US	US	US	OUT	US	US	US	US	US	US	US
6404832	STAR GEORGIA	T4-S-PVT102	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5357173	STAR MASSACHUSETTS	T4-S-PVT102	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
6418754	STAR RHODE ISLAND	T4-S-PVT102	US	US	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5108742	TEXAS TRADER	T5-S-PVT068	US	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
5137872	TROPIC SUN	T5-S-PVT010	US	US	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA	OUTOPA
119 PRODUCT SHIPS														
TYPE: RO/RO														
7702059	1ST LT. ALEXANDER BONNYMAN	C8-M-PVT119	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
8302442	1ST LT. BALDOMERO LOPEZ	C7-M-PVT028	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
8302454	1ST LT. JACK LUMMUS	C7-M-PVT028	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
8219384	2ND LT. JOHN P. BOBO	C7-M-PVT028	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
7920390	AMBASSADOR	C4-M-PVT099	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7909970	AMERICAN CONDOR	C6-M-PVT045	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
7909982	AMERICAN FALCON	C6-M-PVT045	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
7504639	AMERICAN MERLIN	CGM MONET	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7504627	BUFFALO SOLDIER	CGM MONET	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7310911	CAPE DECISION	CAPE D	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: RO/RO														
7228089	CAPE DOUGLAS	CAPE D	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7724083	CAPE HENRY	CAPE H	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7704942	CAPE HORN	CAPE H	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7704930	CAPE HUDSON	CAPE H	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7826178	CAPE WASHINGTON	CAPE W	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
7826166	CAPE WRATH	CAPE W	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
7702047	CPL. LOUIS J. HAUGE JR.	C8-M-PVT119	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
7420493	GREAT LAND	C8-S-PVT016	US	US	US	US	US	US	US	US	US	US	US	US
7506015	KAIMOKU	C8-S-PVT032	US	US	US	US	US	US	US	US	US	US	US	US
7367445	KAINALU	C8-S-PVT033	US	US	US	US	US	US	US	US	US	US	US	US
7717171	MAERSK CONSTELLATION	C5-M-PVT118	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
7912123	MAJOR STEPHEN W. PLESS	C7-S-133A	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
7395351	NORTHERN LIGHTS	C7-S-PVT017	US	US	US	US	US	US	US	US	US	US	US	US
8219396	PFC. DEWAYNE T. WILLIAMS	C7-M-PVT028	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
7823463	PFC. EUGENE A. OBREGON	C7-S-133A	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
7702035	PFC. JAMES ANDERSON, JR.	C8-M-PVT119	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
7702023	PFC. WILLIAM B. BAUGH	C8-M-PVT119	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
6804434	PONCE	C8-S-PVT058	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7717169	PVT. FRANKLIN J. PHILLIPS	C8-M-PVT119	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
8026048	SENATOR	C4-M-PVT099	US	US	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
7802706	SGT. MATEJ KOCAK	C7-S-133A	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
8302466	SGT. WILLIAM R. BUTTON	C7-M-PVT028	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS	MPS
7528130	STRONG TEXAN	C1-M-PVT001	MSC	US	US	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
8300200	STRONG VIRGINIAN	VIRGINIAN PVT	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
7614915	WESTWARD VENTURE	C8-S-PVT016	US	US	US	US	US	US	US	US	US	US	US	US
35 RO/RO SHIPS														
TYPE: RO/RO ITB														
7634331	STRONG/AMERICAN	I85-MT-121A	US	US	US	US	US	US	US	US	US	US	US	US
1 RO/RO ITB SHIPS														
TYPE: SULPHUR														
5215272	MARINE DUVAL	T2-SE-A1-C	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
5270208	MARINE FLORIDIAN	T2-SE-A1-C	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
9077044	SULPHUR ENTERPRISE	T2-SE-A1-C	US	US	US	US	US	US	US	US	US	US	US	US
3 SULPHUR SHIPS														

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: T-AGOS														
N0023	USNS ABLE	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0009	USNS ASSERTIVE	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0017	USNS AUDACIOUS	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0018	USNS BOLD	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0019	USNS CAPABLE	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0110	USNS EFFECTIVE	T-AGOS	OUT	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0025	USNS IMPECCABLE	T-AGOS	OUT	OUT	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0012	USNS INDOMITABLE	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0002	USNS INVINCIBLE	T-AGOS	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
N0024	USNS LOYAL	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0006	USNS PERSISTENT	T-AGOS	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
N0007	USNS PREVAIL	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0010	USNS STALWART	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0011	USNS TENACIOUS	T-AGOS	MSC	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
N0022	USNS VICTORIOUS	T-AGOS	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
15 T-AGOS	SHIPS													
TYPE: T-AGS														
N0030	USNS BOWDITCH	T-AGS 62	OUT	OUT	OUT	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0031	USNS HENSON	T-AGS 63	OUT	OUT	OUT	OUT	OUT	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0003	USNS JOHN MCDONNELL	T-AGS 51	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0004	USNS KANE	T-AGS 27	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0005	USNS LITTLEHALES	T-AGS 52	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0020	USNS PATHFINDER	T-AGS 60	OUT	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0008	USNS SILAS BENT	T-AGS 26	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0021	USNS SUMNER	T-AGS 61	OUT	OUT	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0015	USNS WILKES	T-AGS 33	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
N0016	USNS WYMAN	T-AGS 34	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC	MSC
10 T-AGS	SHIPS													
TYPE: TACS														
7226689	GOPHER STATE (TACS 4)	C5-S-MA73C	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO	PREPO
1 TACS	SHIPS													

LR NUMB	SHIP NAME	HULL DESIGN	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE: TRAWLER														
7710721	ISLAND ENTERPRISE	C1-M-122A	US	US	US	US	US	US	US	US	US	US	US	US
7710745	STELLAR SEA	C1-M-122A	US	US	US	US	US	US	US	US	US	US	US	US

2 TRAWLER SHIPS

416 SHIPS IN SCENARIO II

Appendix D

RESERVE SEALIFT FLEET PROJECTION

U.S. FLAG DATABASE CODES

NDRF	Ships acquired for the National Defense Reserve Fleet at the end of their commercially active life or transferred from the Ready Reserve Force.
PREPO	Ships assigned to the Afloat Prepositioning Force either through charter or activation from the Ready Reserve Force.
ROS	Ships placed in Reduced Operating Status (ROS-4 and ROS-5).
RRF	Ships acquired for the Ready Reserve Force (RRF-10, -20 and -30).
OUT	Ships not in the active U.S. flag fleet because they have been scrapped, sold foreign, permanently reflagged, out of service (long term layup or under conversion) or not yet built or acquired (e.g., Large Medium Speed RO/RO).

LR NUMB	SHIP NAME	HULL DESIGN	TYPE	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE															
BARGE															
7304792	CAPE FAREWELL	C9-S-81D	BARGE	RRF20	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7050248	CAPE FEAR	C8-S-81B	BARGE	ROS-5	RRF-20	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7320411	CAPE FLATTERY	C9-S-81D	BARGE	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7034335	CAPE FLORIDA	C8-S-81B	BARGE	ROS-5	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7205958	CAPE MAY	C8-S-82A	BARGE	ROS-5	RRF-10	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
7117292	CAPE MENDOCINO	C8-S-82A	BARGE	ROS-5	RRF-20	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7223314	CAPE MOHICAN	C8-S-82A	BARGE	RRF-10	RRF-10	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
7 BARGE	SHIPS														
TYPE															
BREAKBULK															
5110965	ADVENTURER	C3-S-38A	BREAKBULK	ROS-5	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5110977	AGENT	C3-S-38A	BREAKBULK	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5110989	AIDE	C3-S-38A	BREAKBULK	ROS-5	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5110991	AMBASSADOR	C3-S-38A	BREAKBULK	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5111000	BANNER	C3-S-46A	BREAKBULK	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5111036	BUYER	C3-S-46A	BREAKBULK	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5004099	CAPE ALAVA	C4-S-58A	BREAKBULK	RRF-10	RRF-30	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5004257	CAPE ALEXANDER (CLF 1)	C4-S-58A	BREAKBULK	RRF-10	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
5004245	CAPE ANN (CLF 2)	C4-S-58A	BREAKBULK	RRF-10	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
5004283	CAPE ARCHWAY	C4-S-58A	BREAKBULK	RRF-10	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
5004398	CAPE AVINOF	C4-S-58A	BREAKBULK	RRF-10	RRF-30	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
6523808	CAPE BLANCO	C4-S-66A	BREAKBULK	ROS-5	RRF-30	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
6621662	CAPE BON	C4-S-66A	BREAKBULK	ROS-5	RRF-30	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
6610560	CAPE BORDA	C4-S-66A	BREAKBULK	ROS-5	RRF-30	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
6610077	CAPE BOVER	C4-S-66A	BREAKBULK	ROS-5	RRF-20	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
6620589	CAPE BRETON	C4-S-66A	BREAKBULK	ROS-5	RRF-20	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
5414660	CAPE CANAVERAL	C3-S-37C	BREAKBULK	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5006176	CAPE CANSO	C3-S-37C	BREAKBULK	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
6221606	CAPE CARTHAGE	C3-S-37C	BREAKBULK	ROS-5	RRF-30	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5241714	CAPE CATAWBA	C3-S-33A	BREAKBULK	RRF-10	RRF-30	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5402552	CAPE CATOCHE	C3-S-37C	BREAKBULK	ROS-5	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5002170	CAPE CHALMERS	C3-S-37C	BREAKBULK	RRF-10	RRF-30	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF

LR NUMB	SHIP NAME	HULL DESIGN	TYPE	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE															
BREAKBULK															
5424691	CAPE CLEAR	C3-S-37C	BREAKBULK	ROS-5	RRF-30	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5322037	CAPE COD	C3-S-37C	BREAKBULK	ROS-5	RRF-30	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
6821614	CAPE GIBSON (CLF 3)	C5-S-75A	BREAKBULK	ROS-5	RRF-20	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
6815512	CAPE GIRARDEAU (CLF 4)	C5-S-75A	BREAKBULK	ROS-5	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20
5057931	CAPE JACOB (CLF 5)	C4-S-1U	BREAKBULK	ROS-5	RRF-10	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20
5056274	CAPE JOHN (CLF 6)	C4-S-1U	BREAKBULK	ROS-5	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20
5215753	CAPE JOHNSON (CLF 7)	C4-S-1U	BREAKBULK	RRF-10	RRF-10	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
5144485	CAPE JUBY (CLF 8)	C4-S-1U	BREAKBULK	RRF-10	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20
6804240	DEL MONTE	C3-S-76A	BREAKBULK	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
6817807	DEL VALLE	C3-S-76A	BREAKBULK	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
6828521	DEL VIENTO	C3-S-76A	BREAKBULK	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
6407872	GULF BANKER	C3-S-37D	BREAKBULK	RRF-10	RRF-30	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5424108	GULF FARMER	C3-S-37D	BREAKBULK	RRF-10	RRF-30	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
6420525	GULF MERCHANT	C3-S-37D	BREAKBULK	RRF-10	RRF-30	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
6411536	GULF SHIPPER	C3-S-37D	BREAKBULK	RRF-10	RRF-30	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
6407884	GULF TRADER	C3-S-37D	BREAKBULK	RRF-10	RRF-30	RRF-10	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5241867	LAKE	C3-S-33A	BREAKBULK	RRF-10	RRF-30	RRF-10	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5241726	NORTHERN LIGHT	C3-S-33A	BREAKBULK	RRF-10	RRF-30	RRF-10	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5014305	PIONEER COMMANDER	C4-S-57A	BREAKBULK	RRF-10	RRF-30	RRF-10	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5400530	PIONEER CONTRACTOR	C4-S-57A	BREAKBULK	RRF-10	RRF-30	RRF-10	RRF-10	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
6404997	PIONEER CRUSADER	C4-S-57A	BREAKBULK	RRF-10	RRF-30	RRF-10	RRF-10	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5241960	PRIDE	C3-S-33A	BREAKBULK	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5242017	SCAN	C3-S-33A	BREAKBULK	ROS-5	RRF-30	RRF-10	RRF-10	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
5242081	SOUTHERN CROSS	C3-S-33A	BREAKBULK	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
46 BREAKBULK SHIPS															
TYPE															
CONT BB20															
5111062	COURIER	C3-S-46B	CONT BB20	RRF-10	RRF-30	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
1 CONT BB20 SHIPS															

LR NUMB	SHIP NAME	HULL DESIGN	TYPE	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE															
CONT RO/RO															
6913429	CAPE NOME	C5-S-78A	CONT RO/RO	RRF-10	RRF-30	RRF-10	RRF-10	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
1 CONT RO/RO SHIPS															
TYPE															
FSS															
7303205	ALGOL	SL7/FSS-1	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS
7315571	ALTAIR	SL7/FSS-2	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS
7226897	ANTARES	SL7/FSS-2	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS
7236153	BELLATRIX	SL7/FSS-1	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS
7223508	CAPELLA	SL7/FSS-3	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS
7325253	DENEBOLA	SL7/FSS-3	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS
7319632	POLLUX	SL7/FSS-2	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS
7302897	REGULUS	SL7/FSS-1	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS	FSS
8 FSS SHIPS															
TYPE															
PRODUCT															
7606516	ALATNA	T1-MET-24A	PRODUCT	RRF-10	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
7737171	AMERICAN EXPLORER	T5-S-RM2A	PRODUCT	RRF-20	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
8450615	CHATTAHOOCHEE	T1-MET-24A	PRODUCT	RRF-10	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
6420056	CHESAPEAKE (OPDS 3)	CHESAPEAKE	PRODUCT	RRF-20	RRF-20	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
6817883	MISSION BUENAVENTURA	T5-S-PVT100	PRODUCT	RRF-20	RRF-30	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20
7034323	MISSION CAPISTRANO	T5-M-PVT101	PRODUCT	RRF-20	RRF-30	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20	RRF-20
5243009	MOUNT VERNON	MOUNT VERNON	PRODUCT	RRF-20	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
6407585	MOUNT WASHINGTON (OPDS 5)	MOUNT VERNON	PRODUCT	RRF-20	RRF-20	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
8450603	NODAWAY	T1-M-8T2	PRODUCT	RRF-10	RRF-10	RRF-10	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF
6329044	PETERSBURG (OPDS 4)	CHESAPEAKE	PRODUCT	RRF-20	RRF-20	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
7737195	SHOSHONE	T5-S-12A	PRODUCT	RRF-20	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF	NDRF

LR NUMB	SHIP NAME	HULL DESIGN	TYPE	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE															
PRODUCT															
11 PRODUCT SHIPS															
TYPE															
RO/RO															
6801664	ADMIRAL WILLIAM M. CALLAGHAN	ADM. CALLAGHAN	RO/RO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7310911	CAPE DECISION	CAPE D	RO/RO	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7208443	CAPE DIAMOND	CAPE D	RO/RO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7229423	CAPE DOMINGO	CAPE D	RO/RO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7228089	CAPE DOUGLAS	CAPE D	RO/RO	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7208297	CAPE DUCATO	CAPE D	RO/RO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7027576	CAPE EDMONT	CAPE E	RO/RO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7724083	CAPE HENRY	CAPE H	RO/RO	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7704942	CAPE HORN	CAPE H	RO/RO	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7704930	CAPE HUDSON	CAPE H	RO/RO	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7390105	CAPE INSCRIPTION	C7-S-95A	RO/RO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
7390117	CAPE INTREPID	C7-S-95A	RO/RO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7390129	CAPE ISABEL	C7-S-95A	RO/RO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
7390131	CAPE ISLAND	C7-S-95A	RO/RO	RRF	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7714636	CAPE KENNEDY	FY94-RORO	RO/RO	OUT	ROS-4	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7715290	CAPE KNOX	FY94-RORO	RO/RO	OUT	ROS-4	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7324390	CAPE LAMBERT	CAPE L	RO/RO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7216854	CAPE LOBOS	CAPE L	RO/RO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7909968	CAPE ORLANDO	C6-M-PVT041	RO/RO	RRF	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7616377	CAPE RACE	CAPE R	RO/RO	RRF	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7530810	CAPE RAY	CAPE R	RO/RO	RRF	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7530808	CAPE RISE	CAPE R	RO/RO	RRF	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
7603497	CAPE TAYLOR	C6-M-PVT039	RO/RO	RRF	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7602247	CAPE TEXAS	C6-M-PVT039	RO/RO	RRF	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7602259	CAPE TRINITY	C6-M-PVT039	RO/RO	RRF	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
8211306	CAPE VICTORY	CAPE V	RO/RO	RRF	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
8211291	CAPE VINCENT	CAPE V	RO/RO	RRF	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
7826178	CAPE WASHINGTON	CAPE W	RO/RO	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
7826166	CAPE WRATH	CAPE W	RO/RO	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
8450665	COMET	C3-ST-14A	RO/RO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4

LR NUMB	SHIP NAME	HULL DESIGN	TYPE	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE															
RO/RO															
8450677	METEOR	C4-S-67A	RO/RO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
001	RORO-1	FY94-RORO	RO/RO	OUT	OUT	OUT	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
002	RORO-2	FY94-RORO	RO/RO	OUT	OUT	OUT	ROS-4	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
003	RORO-3	FY94-RORO	RO/RO	OUT	OUT	OUT	OUT	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
004	RORO-4	FY94-RORO	RO/RO	OUT	OUT	OUT	OUT	ROS-4	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
005	RORO-5	FY94-RORO	RO/RO	OUT	OUT	OUT	OUT	OUT	ROS-4	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10	RRF-10
36 RO/RO SHIPS															
TYPE															
T-AVB															
6905288	CURTISS (TAVB 4)	C5-S-78A	T-AVB	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
6924571	WRIGHT (TAVB 3)	C5-S-78A	T-AVB	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
2 T-AVB SHIPS															
TYPE															
TACS															
6507921	BEAVER STATE (TACS 10)	C6-S-MA60D	TACS	NDRF	RRF-30	RRF-30	ROS-5	ROS-5	ROS-5	ROS-5	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
6916433	CORNHUSKER STATE (TACS 6)	C5-S-MA73C	TACS	RRF-10	RRF-10	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
5170185	DIAMOND STATE (TACS 7)	C6-S-MA1X8	TACS	ROS-5	RRF-20	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
5386605	EQUALITY STATE (TACS 8)	C6-S-MA1XB	TACS	RRF-10	RRF-20	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
6817845	FLICKERTAIL STATE (TACS 5)	C5-S-MA73C	TACS	RRF-10	RRF-10	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
6520911	GEM STATE (TACS 2)	C6-S-MA1QD	TACS	ROS-5	RRF-10	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
6510899	GRAND CANYON STATE (TACS 3)	C6-S-MA1QD	TACS	RRF-10	RRF-10	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
6421347	GREEN MT. STATE (TACS 9)	C6-S-MA60D	TACS	ROS-5	RRF-20	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
6605022	KEYSTONE STATE (TACS 1)	C6-S-MA1QD	TACS	RRF-10	RRF-20	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5	ROS-5
9 TACS SHIPS															

LR NUMB	SHIP NAME	HULL DESIGN	TYPE	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TYPE															
LMSR															
L0001	LMSR-CV-PREPO 1(SHUGART)	LMSR	LMSR	OUT	OUT	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0002	LMSR-CV-PREPO 2(GORDON)	LMSR	LMSR	OUT	OUT	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0003	LMSR-CV-PREPO 3(YANO)	LMSR	LMSR	OUT	OUT	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0004	LMSR-CV-PREPO 4(GILLILAND)	LMSR	LMSR	OUT	OUT	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0005	LMSR-CV-PREPO 5(SODERMAN)	LMSR	LMSR	OUT	OUT	PREPO	PREPO	PREPO	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0014	LMSR-NB-ROS 6	LMSR	LMSR	OUT	OUT	OUT	OUT	OUT	OUT	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0015	LMSR-NB-ROS 7	LMSR	LMSR	OUT	OUT	OUT	OUT	OUT	OUT	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0016	LMSR-NB-ROS 8	LMSR	LMSR	OUT	OUT	OUT	OUT	OUT	OUT	OUT	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0017	LMSR-NB-ROS 9	LMSR	LMSR	OUT	OUT	OUT	OUT	OUT	OUT	OUT	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0018	LMSR-NB-ROS 10	LMSR	LMSR	OUT	OUT	OUT	OUT	OUT	OUT	OUT	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4
L0019	LMSR-NB-ROS 11	LMSR	LMSR	OUT	OUT	OUT	OUT	OUT	OUT	OUT	ROS-4	ROS-4	ROS-4	ROS-4	ROS-4

11 LMSR SHIPS

Appendix E

READY RESERVE FORCE CREWING DOCUMENTS

AS APPROVED NOV '91
BY MAR-100/REV 2/93

RRF VESSEL MANNING SCALES

CATEGORY: DIESEL RO/ROs (11)

SHIP NAMES: CAPE DIAMOND, CAPE DOMINGO, CAPE DECISION, CAPE DOUGLAS, CAPE DUCATO, CAPE EDMONT, CAPE HENRY, CAPE HORN, CAPE HUDSON, CAPE LAMBERT, CAPE LOBOS.

DESIGN(S): Foreign Built

	MISSION	TRIALS
DECK DEPT		
Master	1	1
C/O	1	1
2/O	1	1
3/O	2	1
R/O	1	1
Bosun	1	1
AB Maint	3	1
AB	6	6
SUBTOTAL	16	13
ENG DEPT	(two man engine room)	
C/E	1	1
1st A/E*	1	1
2nd A/E	1	1
3rd A/E	2	1
Elec	1	1
Oiler (diesel)	3	3
QMED	2	1
DMAC	1	0
Reefer Mech	0	0
Pumpman	0	0
SUBTOTAL	12	9
STEWARDS DEPT		
Chief Stwd	0	0
Stwd/Baker	1	1
Chief Cook	1	1
2nd Cook	0	0
3rd Cook	0	0
Stwd Asst	3	3
SUBTOTAL	5	5
Grand Total	33	27

* Mission requirement: Day worker with responsibility for ship inventory control.

SHIP NAME: ADMIRAL CALLAGHAN

DESIGN(S): U.S. NAVY Private design (Gas Turbine RO/RO)

	MISSION	TRIALS
DECK DEPT		
Master	1	1
C/O	1	1
2/O	1	1
3/O	2	2
R/O	1	1
Bosun	1	1
AB Maint	3	1
AB	6	6
SUBTOTAL	16	14
ENG DEPT	(two man engine room)	
C/E	1	1
1st A/E	1	1
2nd A/E	1	1
3rd A/E	2	2
Elec	1	1
Oiler	0	0
QMED	1	1
DMAC	3	3
Reefer Mech	0	0
Pumpman	0	0
SUBTOTAL	10	10
STEWARDS DEPT		
Chief Stwd	0	0
Stwd/Baker	1	1
Chief Cook	1	1
2nd Cook	0	0
3rd Cook	0	0
Stwd Asst	3	3
SUBTOTAL	5	5
Grand Total	31	29

* Mission requirement: Day worker with responsibility for ship inventory control.

CATEGORY: STEAM RO/ROs (3)

SHIP NAMES: CAPE ISABEL, CAPE INSCRIPTION, JUPITER. Enterprise class (C. INTREPID)

DESIGN(S): C7-S-95a

	MISSION	TRIALS
DECK DEPT		
Master	1	1
C/O	1	1
2/O	1	1
3/O	2	1
R/O	1	1
Bosun	1	1
AB Maint	3	2
AB	6	6
SUBTOTAL	16	14
ENG DEPT	(three man engine room)	
C/E	1	1
1st A/E*	1	1
2nd A/E	1	1
3rd A/E	2	1
Elec	1	1
Oiler	3	3
FWT'	3	3
QMED	2	1
DMAC	0	0
Reefer Mech@	0	0
Pumpman	0	0
SUBTOTAL	14	12
STEWARDS DEPT		
Chief Stwd	0	0
Stwd/Baker	1	1
Chief Cook	1	1
2nd Cook	0	0
3rd Cook	0	0
Stwd Asst	3	3
SUBTOTAL	5	5
Grand Total	35	31

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* Mission requirement: Day worker with responsibility for ship inventory control.

' If vessel has USCG approved boiler automation system, FWT's may be deleted.

@ If reefer containers carried as deck cargo add 1 reefer mechanic.

CATEGORY: SEABEE (3)

SHIP NAMES: CAPE MOHICAN, CAPE MAY, CAPE MENDOCINO.

DESIGN(S): C8-S-82a

	MISSION	TRIALS
DECK DEPT		
Master	1	1
C/O	1	1
2/O	1	1
3/O	2	2
R/O	1	1
Bosun	1	1
AB Maint	3	2
AB	6	6
SUBTOTAL	16	15
ENG DEPT	(three man engine room)	
C/E	1	1
1st A/E*	1	1
2nd A/E	1	1
3rd A/E'	3	2
Elec	2	1
Oiler	3	3
FWT@	3	3
QMED	2	1
DMAC	2	0
Reefer Mech	0	0
Pumpman	0	0
SUBTOTAL	18	13
STEWARDS DEPT		
Chief Stwd	1	0
Stwd/Baker	1	1
Chief Cook	1	1
2nd Cook	0	0
3rd Cook	0	0
Stwd Asst	3	3
SUBTOTAL	6	5
Grand Total	**40**	**33**

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* Mission requirement: Day worker with responsibility for ship inventory control.

' Mission- 2 watchstanding 3rd A/E's & 1 day 3rd A/E.

@ If vessel has USCG approved boiler automation system, FWT's may be deleted.

CATEGORY: LASH (4)

SHIP NAMES: CAPE FLORIDA, CAPE FEAR/
CAPE FLATTERY, CAPE FAREWELL.

DESIGN(S): C8-S-81b/ C9-S-81d

	MISSION	TRIALS
DECK DEPT		
Master	1	1
C/O	1	1
2/O	1	1
3/O	2	1
R/O	1	1
Bosun	1	1
AB Maint	3	2
AB	6	6
SUBTOTAL	16	14
ENG DEPT	(three man engine room)	
C/E	1	1
1st A/E*	1	1
2nd A/E	1	1
3rd A/E	2	1
Elec'	2	1
Oiler	3	3
FWT@	3	3
QMED	1	1
DMAC	1	0
Reefer Mech	0	0
Pumpman	0	0
SUBTOTAL	15	12
STEWARDS DEPT		
Chief Stwd	0	0
Stwd/Baker	1	1
Chief Cook	1	1
2nd Cook	0	0
3rd Cook	0	0
Stwd Asst	3	3
SUBTOTAL	5	5
Grand Total	**36**	**31**

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* Mission requirement: Day worker with responsibility for ship inventory control.

' Mission - One additional Electrician required to support operation of barge crane.

@ If vessel has USCG approved boiler automation system, FWT's may be deleted.

CATEGORY: T-ACS 1,2,3 CLASS (3)
SHIP NAMES: KEYSTONE STATE, GEM STATE, GRAND CANYON STATE
DESIGN(S): C6-S-MA1qd

	MISSION	TRIALS
DECK DEPT		
Master	1	1
C/O	1	1
2/O	1	1
3/O*	2	2
R/O	1	1
Bosun	1	1
AB#	6	6
AB Maint#	3	3
OS	3	3
SUBTOTAL	19	19
ENG DEPT	(three man engine room)	
C/E	1	1
1st A/E@	1	1
2nd A/E	1	1
3rd A/E	2	1
Elec	1	1
Oiler	3	3
FWT	3	3
Wiper	1	1
QMED	1	0
DMAC	0	0
Reefer Mech	0	0
Pumpman	0	0
SUBTOTAL	14	12
STEWARDS DEPT		
Chief Stwd	0	0
Stwd/Baker	1	1
Chief Cook	1	1
2nd Cook	0	0
3rd Cook	0	0
Stwd Asst!	5	3
SUBTOTAL	7	5
Grand Total**	**40**	**36**

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* Two 3/O's required onboard during periods underway due to restricted fwd visibility from cranes.

Total of 9 AB's required onboard during periods underway for additional lookout duties due to restricted forward visibility due to cranes. Additionally USCG COI requires 3 OS's.

@ Mission requirement: Day worker with responsibility for ship inventory control.

! —Mission - additional stwd assistants required to support additional embarked military cargo handling personnel.

** Mission - assumes military provides crane operators and cargo handlers. Embarked Mercant crew only capable/trained to provide minimal crane operator/crane maintenance support.

CATEGORY: T-ACS 4,5,6 CLASS (3)

SHIP NAMES: GOPHER STATE, FLICKERTAIL STATE, CORNHUSKER STATE

DESIGN(S): C5-S-MA73c

	MISSION	TRIALS
DECK DEPT		
Master	1	1
C/O	1	1
2/O	1	1
3/O	2	1
R/O	1	1
Bosun	1	1
AB Maint	3	1
AB	6	6
SUBTOTAL	16	13
ENG DEPT	(three man engine room)	
C/E	1	1
1st A/E*	1	1
2nd A/E	1	1
3rd A/E	2	1
Elec	1	1
Oiler	3	3
FWT'	3	3
QMED	2	2
DMAC	0	0
Reefer Mech	0	0
Pumpman	0	0
SUBTOTAL	14	13
STEWARDS DEPT		
Chief Stwd	0	0
Stwd/Baker	1	1
Chief Cook	1	1
2nd Cook	0	0
3rd Cook	0	0
Stwd Asst@	4	3
SUBTOTAL	6	5
Grand Total!	**36**	**31**

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* Mission requirement: Day worker with responsibility for ship inventory control.

' If vessel has USCG approved boiler automation system, FWT's may be deleted.

@ Mission - additional stwd assistants required to support additional embarked military cargo handling personnel.

! Mission - assumes military provides crane operators and cargo handlers. Embarked Merchant crew only capable/trained to provide minimal crane operator/crane maintenance support.

CATEGORY: T-ACS 7,8 CLASS (2) / T-ACS 9,10 CLASS (2)
SHIP NAMES: DIAMOND STATE, EQUALITY STATE/
GREEN MOUNTAIN STATE, BEAVER STATE
DESIGN(S): C6-S-MA1xb
C6-S-MA60d

	MISSION	TRIALS
DECK DEPT		
Master	1	1
C/O	1	1
2/O	1	1
3/O	2	1
R/O	1	1
Bosun	1	1
AB	6	6
AB Maint*	3	3
OS	3	3
SUBTOTAL	19	18
ENG DEPT	(three man engine room)	
C/E	1	1
1st A/E'	1	1
2nd A/E	1	1
3rd A/E	2	1
Elec	1	1
Oiler	3	3
FWT@	3	3
QMED	2	2
DMAC	0	0
Reefer Mech	0	0
Pumpman	0	0
SUBTOTAL	14	13
STEWARDS DEPT		
Chief Stwd	0	0
Stwd/Baker	1	1
Chief Cook	1	1
2nd Cook	0	0
3rd Cook	0	0
Stwd Asst!	5	3
SUBTOTAL	7	5
GrandTotal**	40	36

* Total of 9 AB's required onboard during periods underway for additional lookout duties due to restricted forward visibility due to cranes. Additionally, USCG COI requires 3 OS's.

' Mission requirement: Day worker with responsibility for ship inventory control.

@ If vessel has USCG approved boiler automation system, FWT's may be deleted.

! Mission - additional sted assistants required to support additional embarked military cargo handling personnel.

** Mission - assumes military provides crane operators and cargo handlers. Embarked Merchant crew only capable/trained to provide minimal crane operator/crane maintenance support.

CATEGORY: C-3 DESIGN BREAKBULK (point to point svc) (29)

SHIP NAMES: LAKE, SCAN, PRIDE, N.LIGHT, CAPE CATAWBA, S. CROSS, CAPE(s) CATOCHE, CARTHAGE, CANAVERAL, CHALMERS, *CHARLES*, CLEAR, COD, CANSO, GULF(s) BANKER, FARMER, MERCHANT, SHIPPER, TRADER/ ADVENTURER, AGENT, AMBASSADOR, AIDE/ BANNER, BUYER/ COURIER/ DEL(s) VIENTO, VALLE, MONTE.

DESIGN(S): C3-S-33a/37c/37d/38a/46a/46b/76a.

	MISSION	TRIALS
DECK DEPT		
Master	1	1
C/O	1	1
2/O	1	1
3/O	2	1
R/O	1	1
Bosun	1	1
AB Maint	3	2
AB	6	6
SUBTOTAL	16	14
ENG DEPT	(three man engine room)	
C/E	1	1
1st A/E*	1	1
2nd A/E	1	1
3rd A/E	2	1
Elec	1	1
Oiler	3	3
FWT#	3	3
QMED	1	1
DMAC	0	0
Reefr Mech@	0	0
Pumpman	0	0
SUBTOTAL	13	12
STEWARDS DEPT		
Chief Stwd	0	0
Stwd/Baker	1	1
Chief Cook	1	1
2nd Cook	0	0
3rd Cook	0	0
Stwd Asst	3	3
SUBTOTAL	5	5
Grand Total	34	31

---

* Mission requirement: Day worker with responsibility for ship inventory control.

If vessel has USCG approved boiler automation system, FWT's may be deleted.

@ If reefer cargo holds or on deck reefer containers utilized add 1 reefer mechanic.

CATEGORY: C-4/C-5 DESIGN BREAKBULK (point to point svc) (22)

SHIP NAMES: COMET/ METEOR/ CAPE JOHNSON, CAPE JUBY, SANTA ANA, CALIFORNIA/ PIONEER(s) CONTRACTOR, CRUSADER, COMMANDER/ CAPE ALEXANDER, ALAVA, ANN, ARCHWAY, AVINOF/ CAPE(s) BOVER, BORDA, BON, BRETON, BLANCO. CAPE(s) GIBSON, GIRARDEAU/ CAPE NOME.

DESIGN(S): C4-S-14a/67a/1u/57a/58a/66a.
C5-S-75a/78a.

	MISSION	TRIALS
DECK DEPT		
Master	1	1
C/O	1	1
2/O	1	1
3/O	2	1
R/O	1	1
Bosun	1	1
AB Maint	3	2
AB	6	6
SUBTOTAL	16	14
ENG DEPT	(three man engine room)	
C/E	1	1
1st A/E*	1	1
2nd A/E	1	1
3rd A/E	2	2
Elec	1	1
Oiler	3	3
FWT'	3	3
QMED	2	1
DMAC	1	0
Reefer Mech@	0	0
Pumpman	0	0
SUBTOTAL	15	13
STEWARDS DEPT		
Chief Stwd	0	0
Stwd/Baker	1	1
Chief Cook	1	1
2nd Cook	0	0
3rd Cook	0	0
Stwd Asst	3	3
SUBTOTAL	5	5
Grand Total	**36**	**32**

---

* Mission requirement: Day worker with responsibility for ship inventory control.

' If vessel has USCG approved boiler automation system, FWT's may be deleted.

@ If reefer cargo holds or on deck reefer containers utilized, add 1 reefer mech.

CATEGORY: BREAKBULK W/ SEF MISSION (MCDS) (4) REV 1

SHIP NAMES: CAPE ALEXANDER/CAPE JUBY, CAPE JOHNSON, SANTA ANA, CALIFORNIA (CAPE JACOB)

DESIGN(S): C4-S-58a/C4-S-1u

	MISSION
DECK DEPT	
Master	1
C/O	1
2/O*	2
3/O	2
R/O	1
Bosun	4
AB	6
AB Maint	27
Nurse	1
SUBTOTAL	45
ENG DEPT (three man engine room)	
C/E	1
1st A/E#	1
2nd A/E	1
3rd A/E@	3
Elec	2
Oiler	3
FWT	3
QMED	3
DMAC	0
Reefer Mech	1
Pumpman	0
SUBTOTAL	18
STEWARDS DEPT	
Chief Stwd	1
Stwd/Baker	0
Chief Cook	1
2nd Cook	1
3rd Cook	0
Stwd Asst	6
SUBTOTAL	9
Grand Total	**72**

Note: See Breakbulk (point to point) for non-mission manning.

---

* Mission - One watchstanding 2/O & 1 dayworking 2/O to assist C/O w/ cargo gear, rigging, unrep equip, etc.

Mission requirement: Day worker with responsibility for ship inventory control.

@ Mission - Two watchstanding 3rd A/E's & One day 3rd A/E to work on UNREP equipment.

CATEGORY: BREAKBULK W/ SEF MISSION (Sliding Padeye/VERTREP) (3)

SHIP NAMES: CAPE ARCHWAY, CAPE ANN, CAPE AVINOF

DESIGN(S): C4-S-58a

	MISSION
DECK DEPT	
Master	1
C/O	1
2/O*	2
3/O	2
R/O	1
Bosun	4
AB	6
AB Maint	27
Nurse	1
SUBTOTAL	45
ENG DEPT (three man engine room)	
C/E	1
1st A/E'	1
2nd A/E	1
3rd A/E@	3
Elec	1
Oiler	3
FWT	3
QMED	3
DMAC	0
Reefer Mech	1
Pumpman	0
Subtotal	17
STEWARDS DEPT	
Chief Stwd	1
Stwd/Baker	0
Chief Cook	1
2nd Cook	1
3rd Cook	0
Stwd Asst	5
SUBTOTAL	8
Grand Total	**70**

Note: See Breakbulk (point to point) for non-mission manning.

---

* Mission - One watchstanding 2/O & 1 dayworking 2/O to assist C/O w/ cargo gear, rigging, unrep equip, etc.

' Mission requirement: Day worker with responsibility for ship inventory control.

@ Mission - Two watchstanding 3rd A/E's & One day 3rd A/E to work on UNREP equipment.

CATEGORY: BREAKBULK W/ SEF MISSION (Sliding Padeye) (6)

SHIP NAMES: SOUTHERN CROSS/
ADVENTURER, AGENT, AMBASSADOR, AIDE/
CAPE ALAVA.

DESIGN(S): C3-S-33a/
C3-S-38a/
C4-S-58a.

	MISSION
DECK DEPT	
Master	1
C/O	1
2/O	2
3/O	2
R/O	1
Bosun	3
AB	6
AB Maint	27
Nurse	1
SUBTOTAL	44
ENG DEPT	(three man engine room)
C/E	1
1st A/E'	1
2nd A/E	1
3rd A/E@	3
Elec	1
Oiler	3
FWT	3
QMED	3
DMAC	0
Reefer Mech	1
Pumpman	0
SUBTOTAL	17
STEWARDS DEPT	
Chief Stwd	1
Stwd/Baker	0
Chief Cook	1
2nd Cook	1
3rd Cook	0
Stwd Asst	5
SUBTOTAL	8
Grand Total	69

Note: See Breakbulk (point to point) for non-mission manning.

Mission - One watchstanding 2/O & 1 dayworking 2/O to assist C/O w/ cargo gear, rigging, unrep equip, etc.

' Mission requirement: Day worker with responsibility for ship inventory control.

@ Mission - Two watchstanding 3rd A/E's & One day 3rd A/E to work on UNREP equipment.

CATEGORY: OPDS TANKER (STEAM) (3)

SHIP NAMES: POTOMAC/ AMERICAN OSPREY, CHESAPEAKE.

DESIGN(S): T5-S-12a/ Private design

	MISSION	TRIALS
DECK DEPT		
Master	1	1
C/O	1	1
2/O	1	1
3/O	2	1
R/O	1	1
Bosun	1	1
AB	6	6
AB Maint	6	2
SUBTOTAL	19	14
ENG DEPT	(three man engine room)	
C/E	1	1
1st A/E#	1	1
2nd A/E	1	1
3rd A/E	2	1
Elec	0	1
Oiler	3	3
FWT@	3	3
QMED	1	1
DMAC	1	0
Reefer Mech	0	0
Pumpman!	2	1
SUBTOTAL	15	13
STEWARDS DEPT		
Chief Stwd	0	0
Stwd/Baker	1	1
Chief Cook	1	1
2nd Cook	0	0
3rd Cook	0	0
Stwd Asst	4	3
SUBTOTAL	6	5
Grand Total	**40**	**32**

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* 3 Additional AB's required to support OPDS Operations.

Mission requirement: Day worker with responsibility for ship inventory control.

@ If vessel has USCG approved boiler automation system, FWT's may be deleted.

! Mission - Two pumpman required to support OPDS cargo system. Trials - One Pumpman required to support cargo system testing.

CATEGORY: STEAM TANKER (point to point) (6)

SHIP NAMES: SHOSHONE/ AMERICAN EXPLORER/
MISSION BUENAVENTURA, MT VERNON,
MT WASHINGTON, PETERSBURG.

DESIGN(S): T5-S-12a/T5-S-RM2a/
Private design.

	MISSION	TRIALS
DECK DEPT		
Master	1	1
C/O	1	1
2/O	1	1
3/O	2	1
R/O	1	1
Bosun	1	1
AB Maint	2	2
AB	6	6
SUBTOTAL	15	14
ENG DEPT	(three man engine room)	
C/E	1	1
1st A/E*	1	1
2nd A/E	1	1
3rd A/E	2	1
Elec	0	0
Oiler	3	3
FWT'	3	3
QMED	1	1
DMAC	0	0
Reefer Mech	0	0
Pumpman@	1	1
SUBTOTAL	13	12
STEWARDS DEPT		
Chief Stwd	0	0
Stwd/Baker	1	1
Chief Cook	1	1
2nd Cook	0	0
3rd Cook	0	0
Stwd Asst	3	3
SUBTOTAL	5	5
Grand Total	33	31

---

* Mission requirement: Day worker with responsibility for ship inventory control.

' If vessel has USCG approved boiler automation system, FWT's may be deleted.

@ Trials - One Pumpman required for trials to support cargo system testing.

CATEGORY: DIESEL TANKER (point to point) (1)

SHIP NAMES: MISSION CAPISTRANO

DESIGN(S): Private design

	MISSION	TRIALS
DECK DEPT		
Master	1	1
C/O	1	1
2/O	1	1
3/O	2	1
R/O	1	1
Bosun	1	1
AB Maint	2	1
AB	6	6
SUBTOTAL	15	13
ENG DEPT	(two man engine room)	
C/E	1	1
1st A/E	1	1
2nd A/E	1	1
3rd A/E	2	1
Elec	0	0
Oiler (diesel)	3	3
FWT	0	0
QMED	1	1
DMAC	0	0
Reefer Mech	0	0
Pumpman'	1	1
SUBTOTAL	10	9
STEWARDS DEPT		
Chief Stwd	0	0
Stwd/Baker	1	1
Chief Cook	1	1
2nd Cook	0	0
3rd Cook	0	0
Stwd Asst	3	3
SUBTOTAL	5	5
Grand Total	30	27

---

* Mission requirement: Day worker with responsibility for ship inventory control.

' Trials - One Pumpman required for trials to support cargo system testing.

CATEGORY: T-1 DIESEL TANKER (3)

SHIP NAMES: NODAWAY, ALATNA, CHATTAHOOCHIE

DESIGN(S): T1-MET-24a

	MISSION	TRIALS
DECK DEPT		
Master	1	1
C/O	1	1
2/O	1	1
3/O	1	1
R/O	1	1
Bosun	1	1
AB Maint	2	1
AB	6	6
SUBTOTAL	14	13
ENG DEPT	(two man engine room)	
C/E	1	1
1st A/E*	1	1
2nd A/E	1	1
3rd A/E	2	1
Elec	1	1
Oiler (diesel)	3	3
QMED	1	1
DMAC	0	0
Reefer Mech	0	0
Pumpman'	1	1
SUBTOTAL	11	~~11~~ 10
STEWARDS DEPT		
Chief Stwd	0	0
Stwd/Baker	1	1
Chief Cook	1	1
2nd Cook	0	0
3rd Cook	0	0
Stwd Asst	3	3
SUBTOTAL	5	5
Grand Total	30	~~29~~ 28

Col adds to 28

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* Mission requirement: Day worker with responsibility for ship inventory control.

' Trials - One Pumpman required for trials to support cargo system testing.

CATEGORY: T-AVB 3,4 CLASS

SHIP NAMES: WRIGHT, CURTISS

DESIGN(S): ex C5-S-78a converted to Navy design T-AVB

	MISSION	TRIALS
DECK DEPT		
Master	1	1
C/O	1	1
2/O	1	1
3/O	2	1
R/O	1	1
Bosun	1	1
AB Maint	3	1
AB	6	6
SUBTOTAL	16	13
ENG DEPT	(three man engine room)	
C/E	1	1
1st A/E*	1	1
2nd A/E	1	1
3rd A/E	2	1
Elec'	2	1
Oiler	3	3
FWT@	3	3
Plumber	1	0
QMED!	2	1
DMAC@	1	0
Reefer Mech@	1	0
Pumpman	0	0
SUBTOTAL	17	12
STEWARDS DEPT		
Chief Stwd	1	0
Stwd/Baker	1	1
Chief Cook	1	1
2nd Cook	0	0
3rd Cook	0	0
Stwd Asst**	4	3
SUBTOTAL	7	5
Grand Total	**40**	**30**

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* Mission requirement: Day worker with responsibility for ship inventory control.

' Mission - Two electricians required during IMA deployments; 1 for ship & 1 to assist USMC.

@ If vessel has USCG approved boiler automation system, FWT's may be deleted.

! Mission - One additional QMED required to support embarked USMC IMA.

** Chief stwd and additional stwd assistants required to assist embarked USMC galley personnel w/ equip/stores, etc.

Appendix F

GRAPHS AND SUPPLY/DEMAND DETAIL FOR SCENARIO I - NO MARITIME SECURITY PROGRAM

Crewing Supply/Demand Detail for 2001 - Case 1, Full Crew

	Deck Officers	Unlicensed Deck	Engine Officers	Unlicensed Engineers
MARINER DEMAND				
LMSR	44	110	11	44
FSS	48	56	72	72
ROS-4/5	251	478	286	432
RRF-10/20/30	125	247	126	191
TOTAL	468	891	495	739
MARINER SUPPLY	584	512	597	320
SHORTFALL/SURPLUS	+116	-379	+102	-419

Unlicensed supply/demand do not include unskilled billets such as Ordinary Seaman or Wiper

Crewing Supply/Demand Detail for 2001 - Case 2, Full Crew with Reduced Operating Status Crews

	Deck Officers	Unlicensed Deck	Engine Officers	Unlicensed Engineers
MARINER DEMAND				
LMSR	44	110	11	44
FSS	48	56	72	72
ROS-4/5	171	458	110	222
RRF-10/20/30	125	247	126	191
TOTAL	388	871	319	529
MARINER SUPPLY	584	512	597	320
SHORTFALL/SURPLUS	+196	-359	+278	-209

Unlicensed supply/demand do not include unskilled billets such as Ordinary Seaman or Wiper

Crewing Supply/Demand Detail for 2001 - Case 3, Reduced Crew

	Deck Officers	Unlicensed Deck	Engine Officers	Unlicensed Engineers
MARINER DEMAND				
LMSR	33	88	0	22
FSS	32	56	48	48
ROS-4/5	207	362	236	256
RRF-10/20/30	100	176	100	110
TOTAL	372	682	384	436
MARINER SUPPLY	584	512	597	320
SHORTFALL/SURPLUS	+212	-170	+213	-116

Unlicensed supply/demand do not include unskilled billets such as Ordinary Seaman or Wiper

Crewing Supply/Demand Detail for 2001 - Case 4, Reduced Crew with Reduced Operating Status Crews

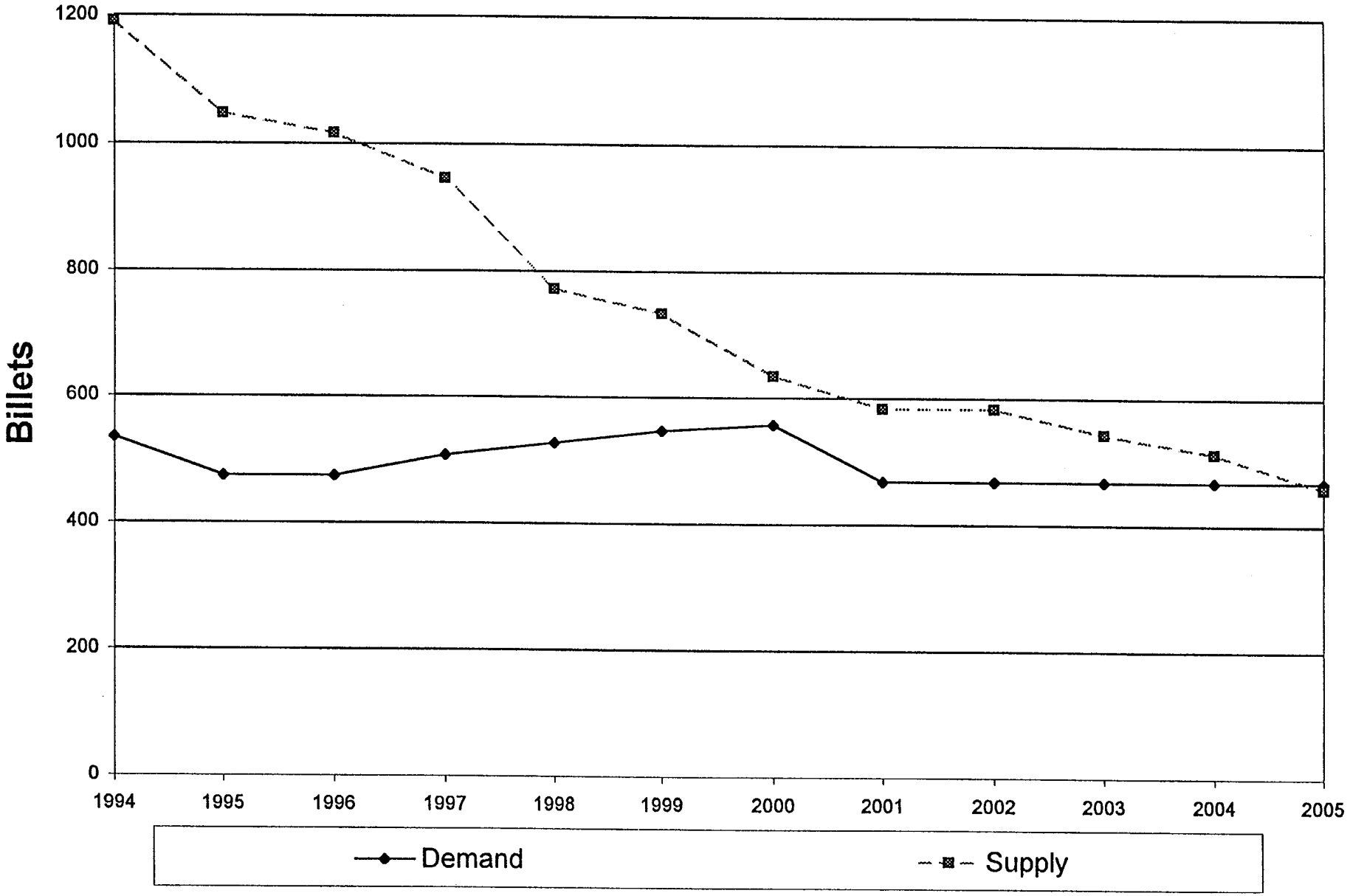
	Deck Officers	Unlicensed Deck	Engine Officers	Unlicensed Engineers
MARINER DEMAND				
LMSR	33	88	0	22
FSS	32	56	48	48
ROS-4/5	127	342	24	46
RRF-10/20/30	100	176	100	110
TOTAL	292	662	172	226
MARINER SUPPLY	584	512	597	320
SHORTFALL/SURPLUS	+292	-150	+425	+94

Unlicensed supply/demand do not include unskilled billets such as Ordinary Seaman or Wiper

SCENARIO I
NO SUBSIDY

DECK OFFICER
SUPPLY/DEMAND ANALYSIS

CASE 1
FULL CREW
GRAPH 1

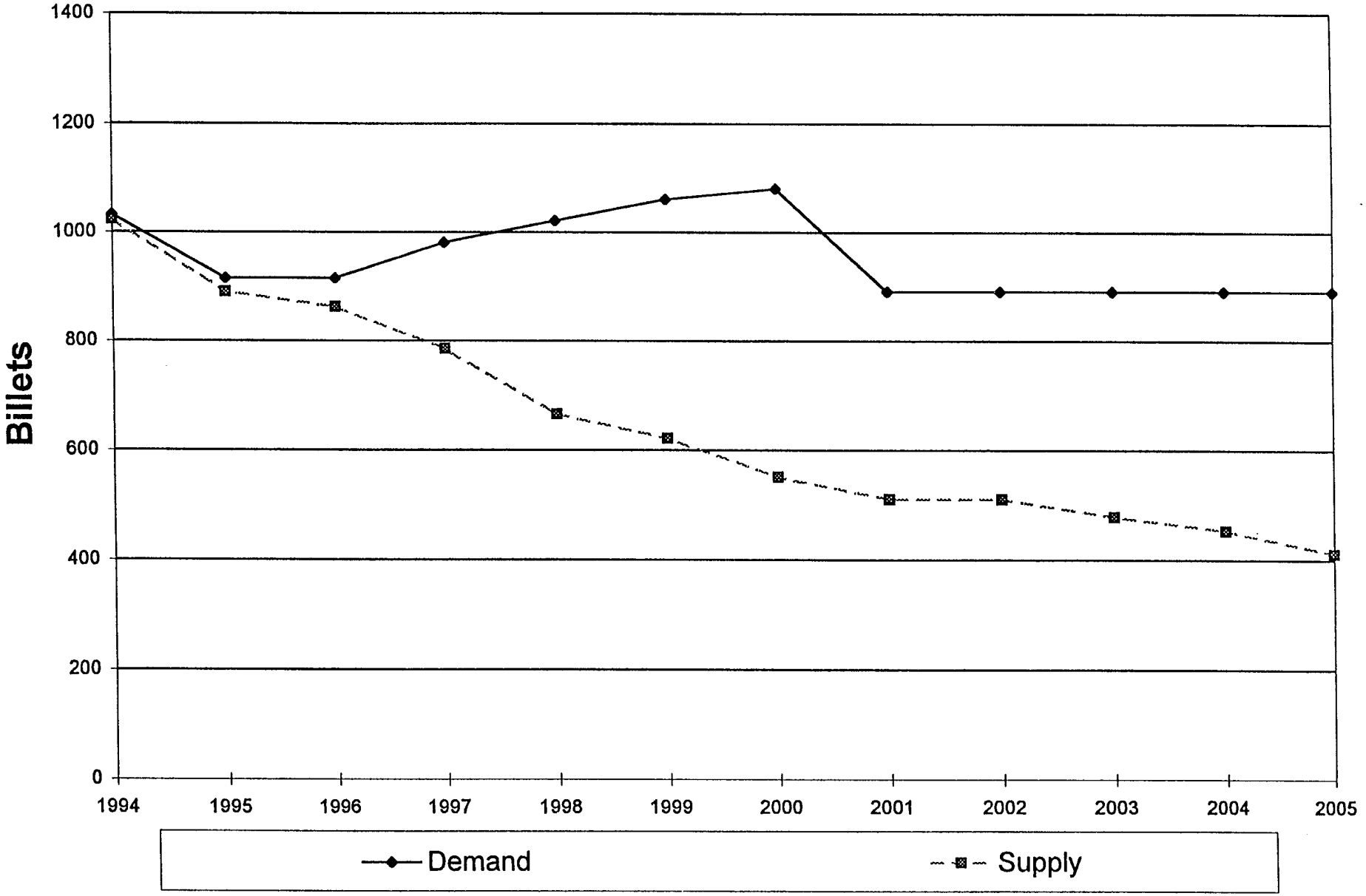


SCENARIO I
NO SUBSIDY

SKILLED UNLICENSED DECK

SUPPLY/DEMAND ANALYSIS

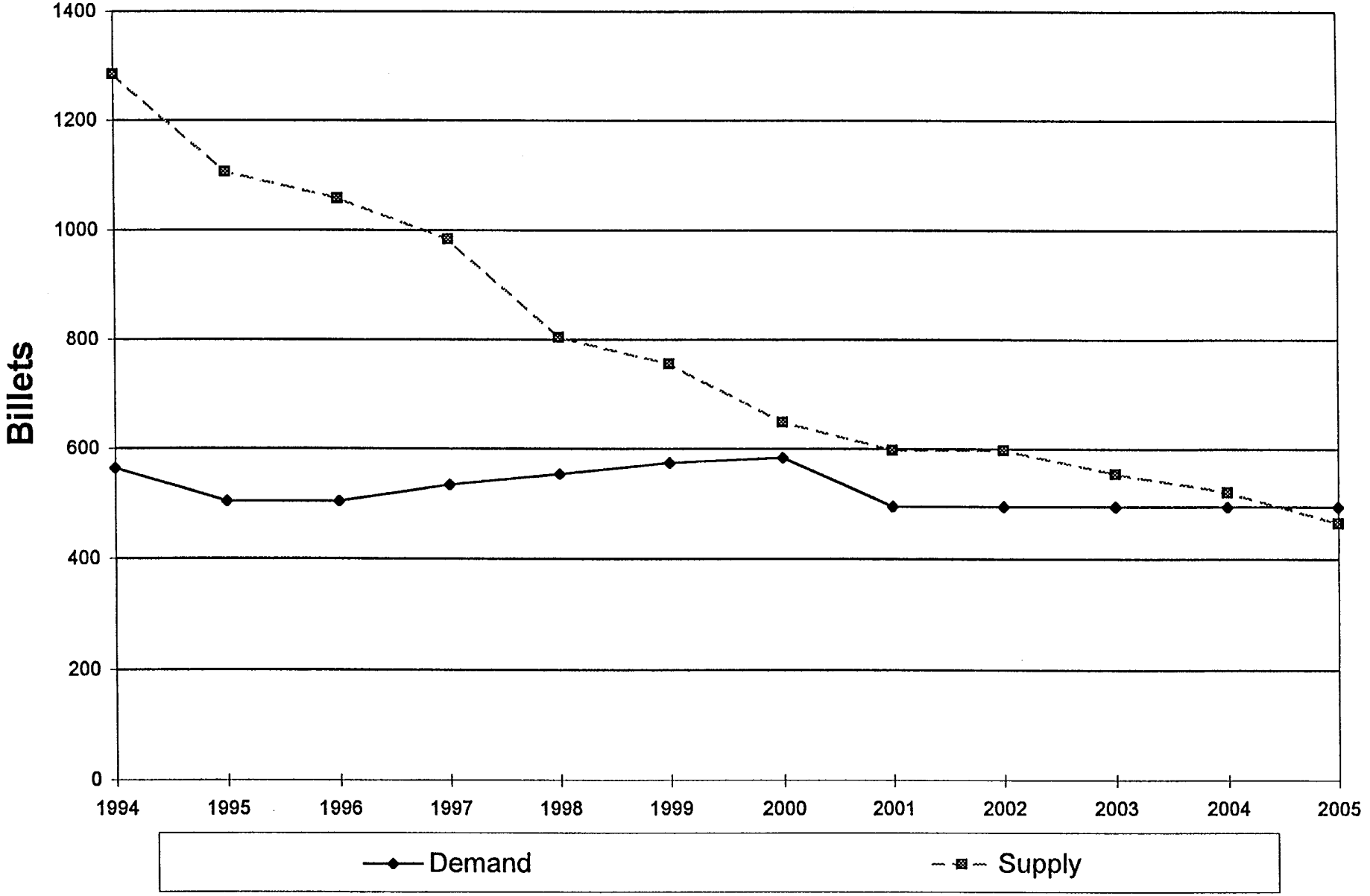
CASE 1
FULL CREW
GRAPH 2



SCENARIO I
NO SUBSIDY

ENGINEERING OFFICER
SUPPLY/DEMAND ANALYSIS

CASE 1
FULL CREW
GRAPH 3

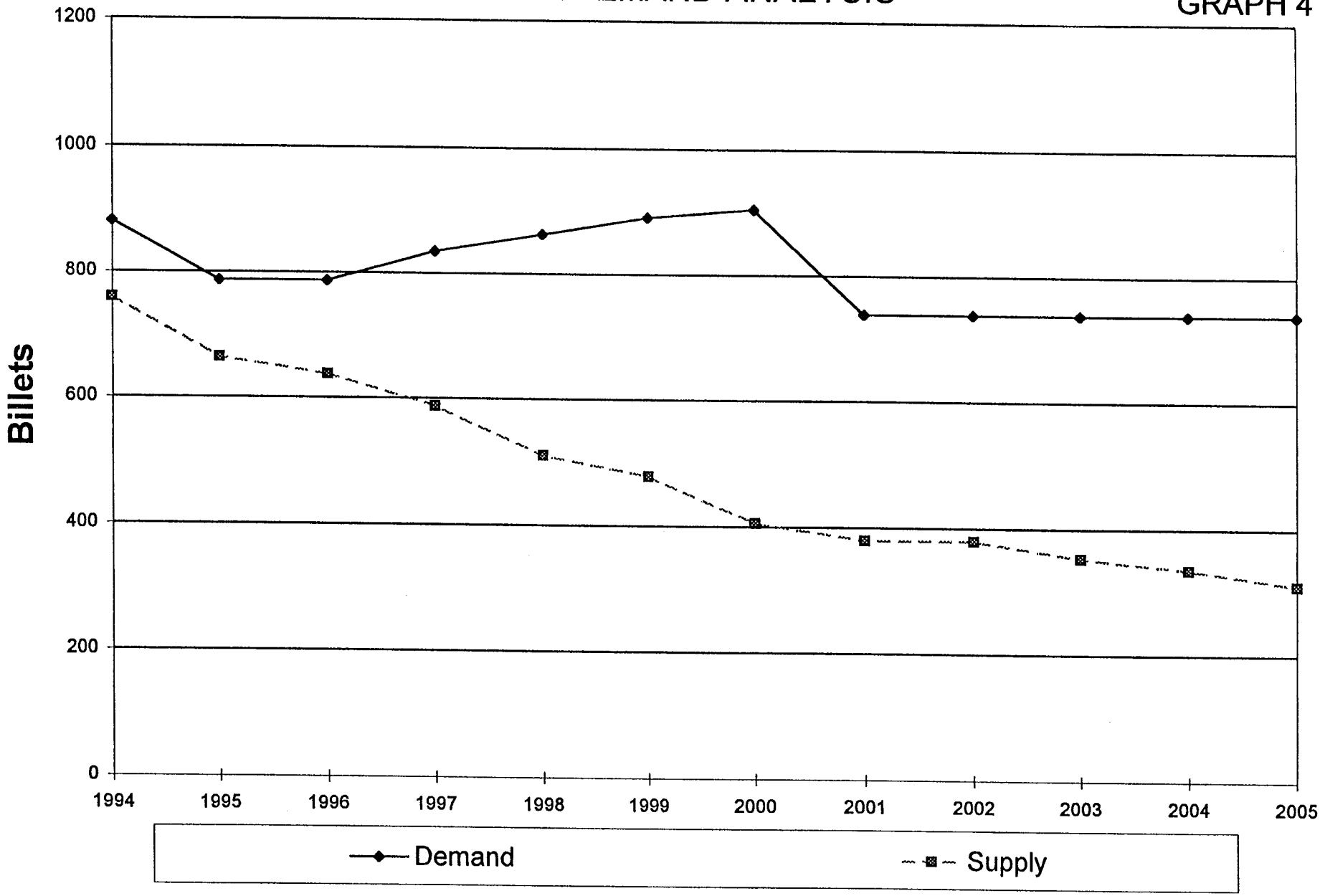


SCENARIO I
NO SUBSIDY

SKILLED UNLICENSED ENGINEERING

SUPPLY/DEMAND ANALYSIS

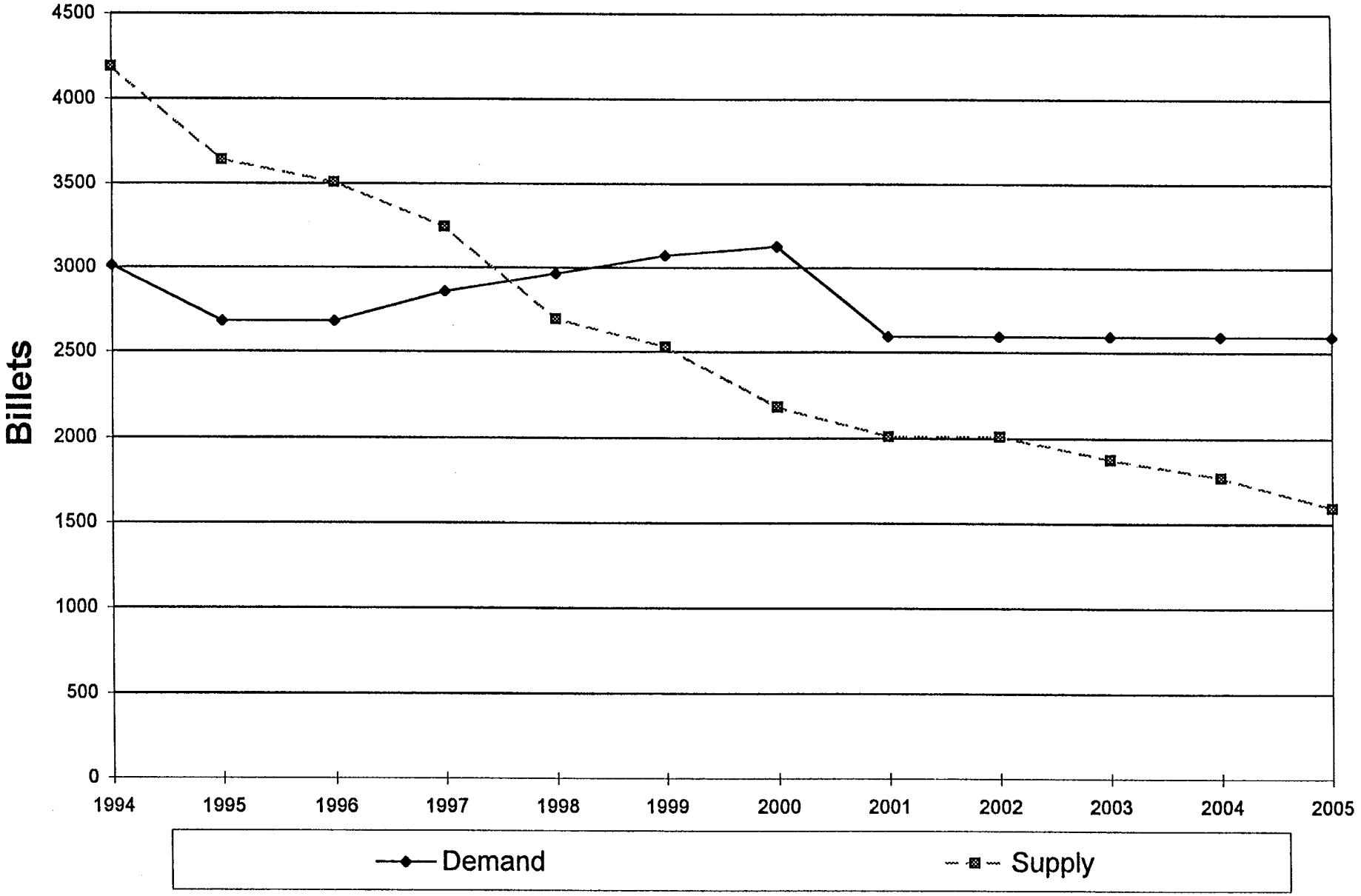
CASE 1
FULL CREW
GRAPH 4



SCENARIO I
NO SUBSIDY

SKILLED BILLETS
SUPPLY/DEMAND ANALYSIS

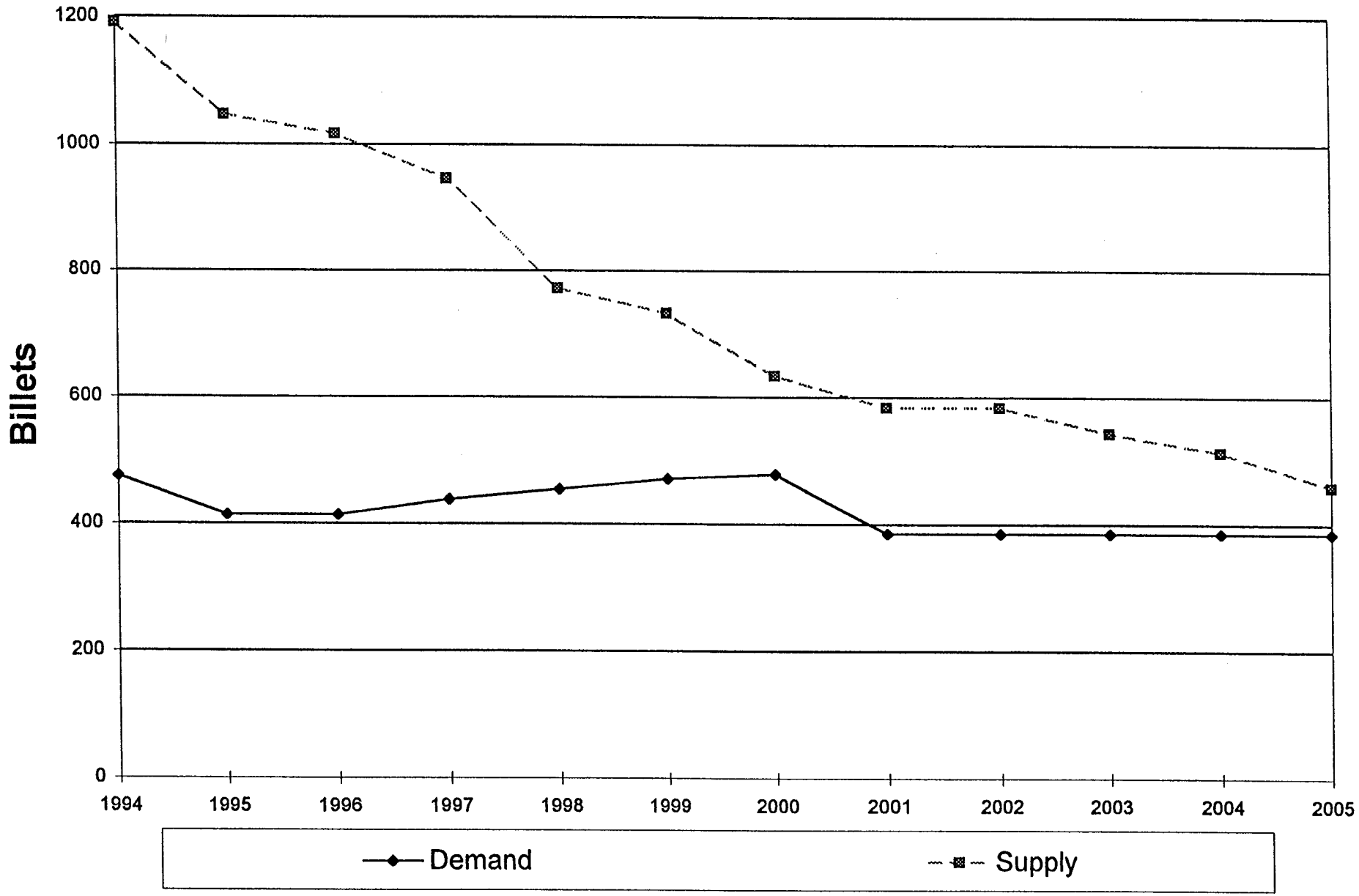
CASE 1
FULL CREW
GRAPH 5



SCENARIO I
NO SUBSIDY

DECK OFFICER
SUPPLY/DEMAND ANALYSIS

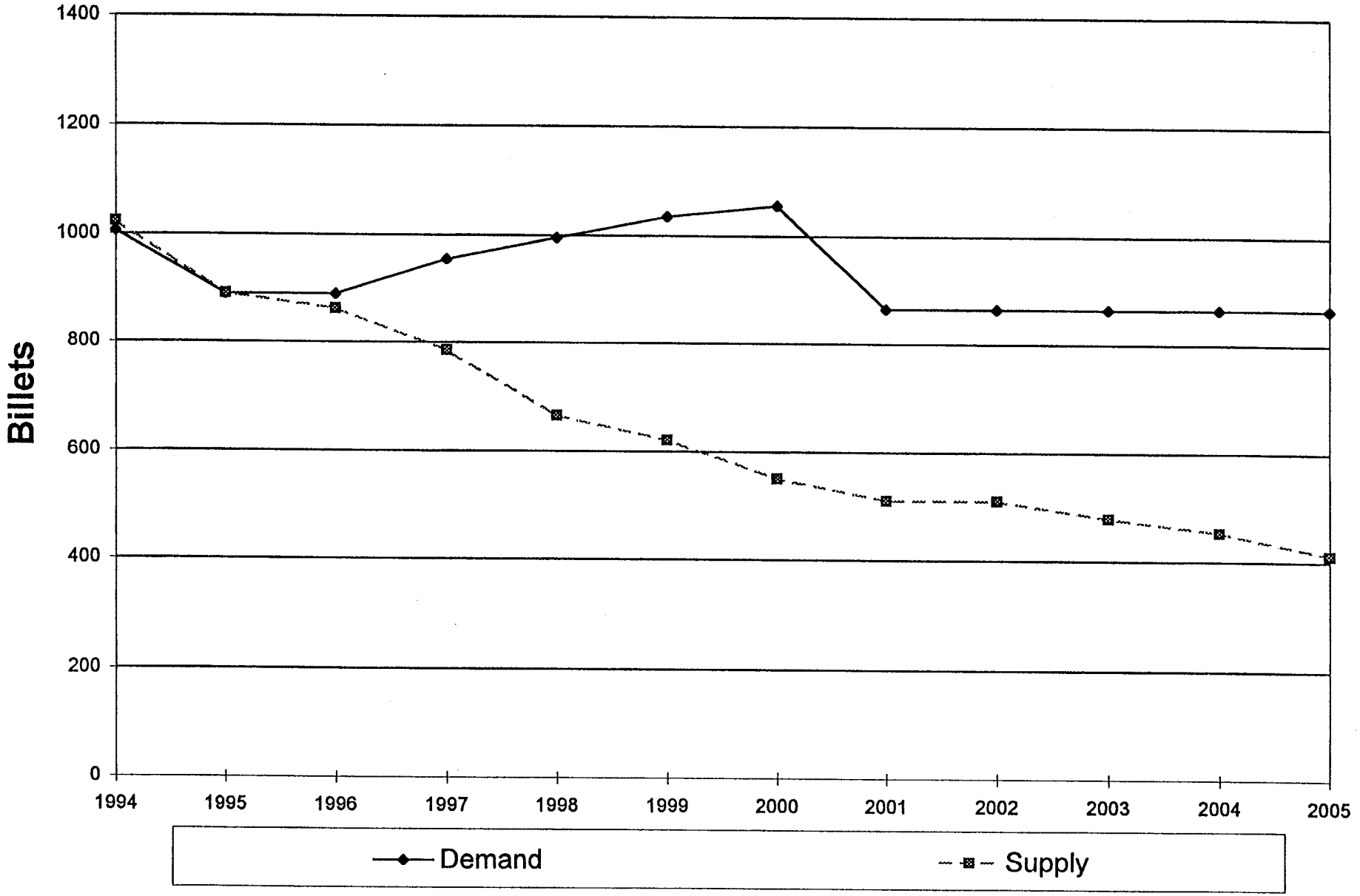
CASE 2
FULL CREW/ROS
GRAPH 6



SCENARIO I
NO SUBSIDY

SKILLED UNLICENSED DECK
SUPPLY/DEMAND ANALYSIS

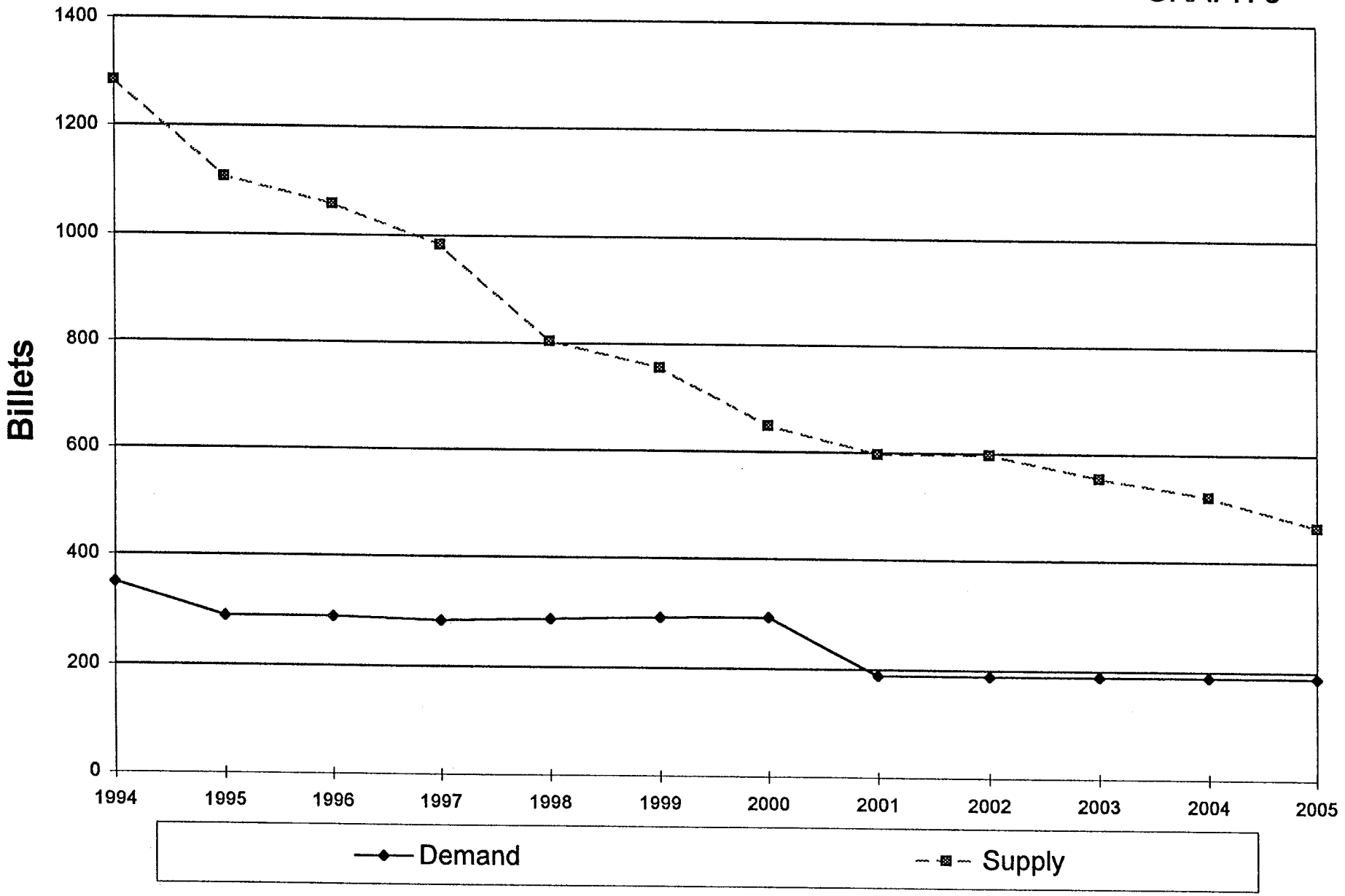
CASE 2
FULL CREW/ROS
GRAPH 7



SCENARIO I
NO SUBSIDY

ENGINEERING OFFICER
SUPPLY/DEMAND ANALYSIS

CASE 2
FULL CREW/ROS
GRAPH 8

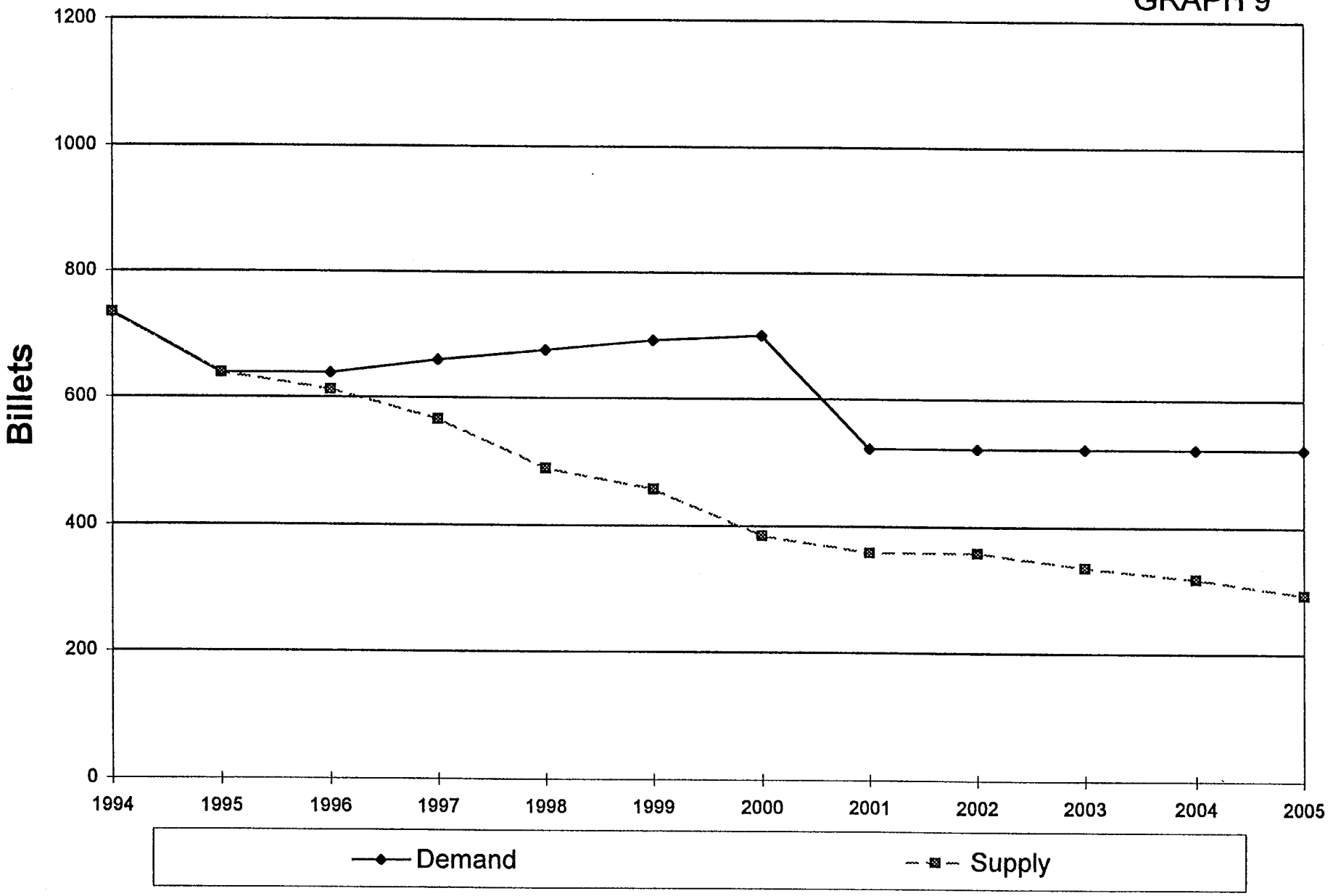


SCENARIO I
NO SUBSIDY

SKILLED UNLICENSED ENGINEERING

SUPPLY/DEMAND ANALYSIS

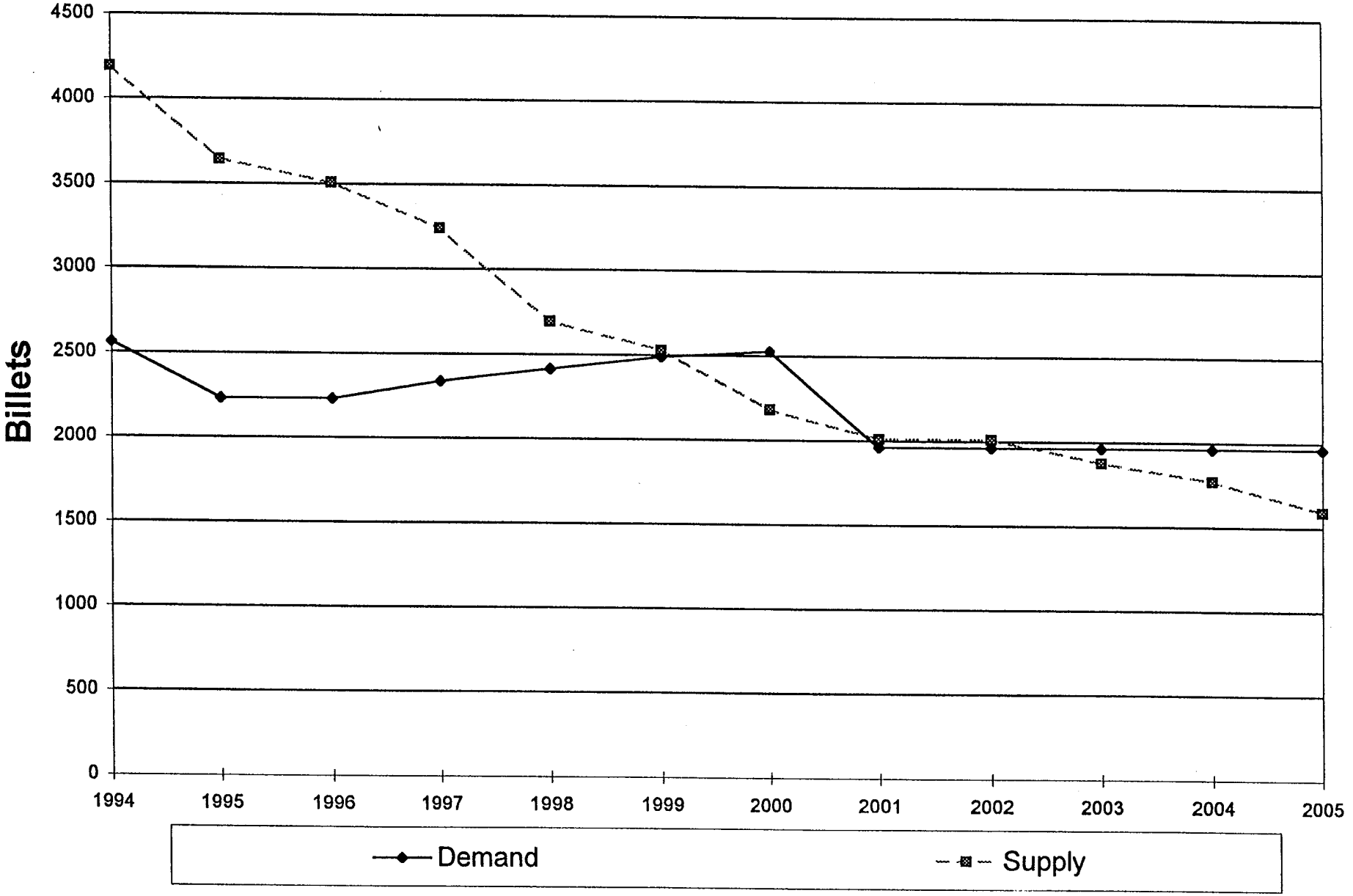
CASE 2
FULL CREW/ROS
GRAPH 9



SCENARIO I
NO SUBSIDY

SKILLED BILLETS
SUPPLY/DEMAND ANALYSIS

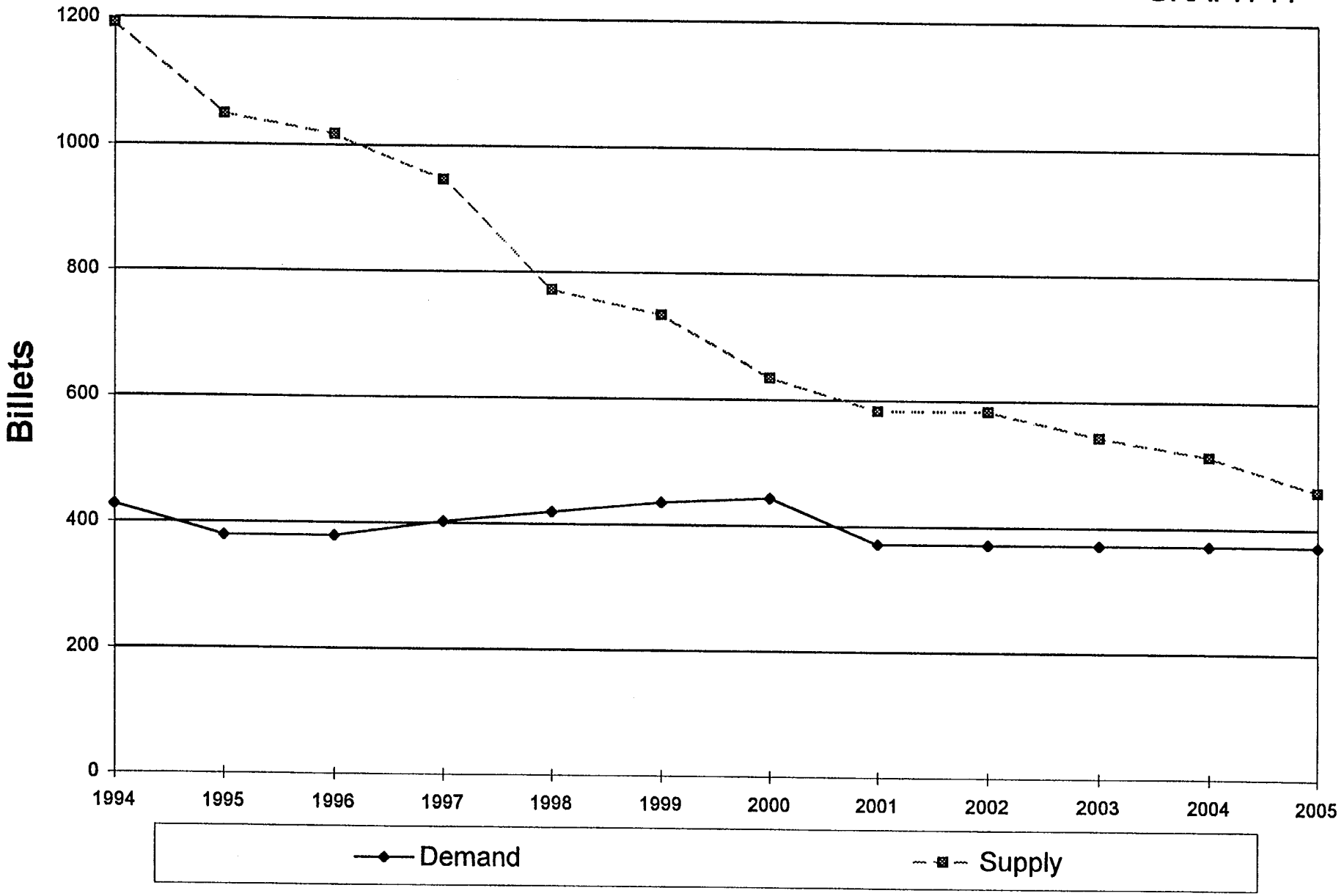
CASE 2
FULL CREW/ROS
GRAPH 10



SCENARIO I
NO SUBSIDY

DECK OFFICER
SUPPLY/DEMAND ANALYSIS

CASE 3
REDUCED CREW
GRAPH 11

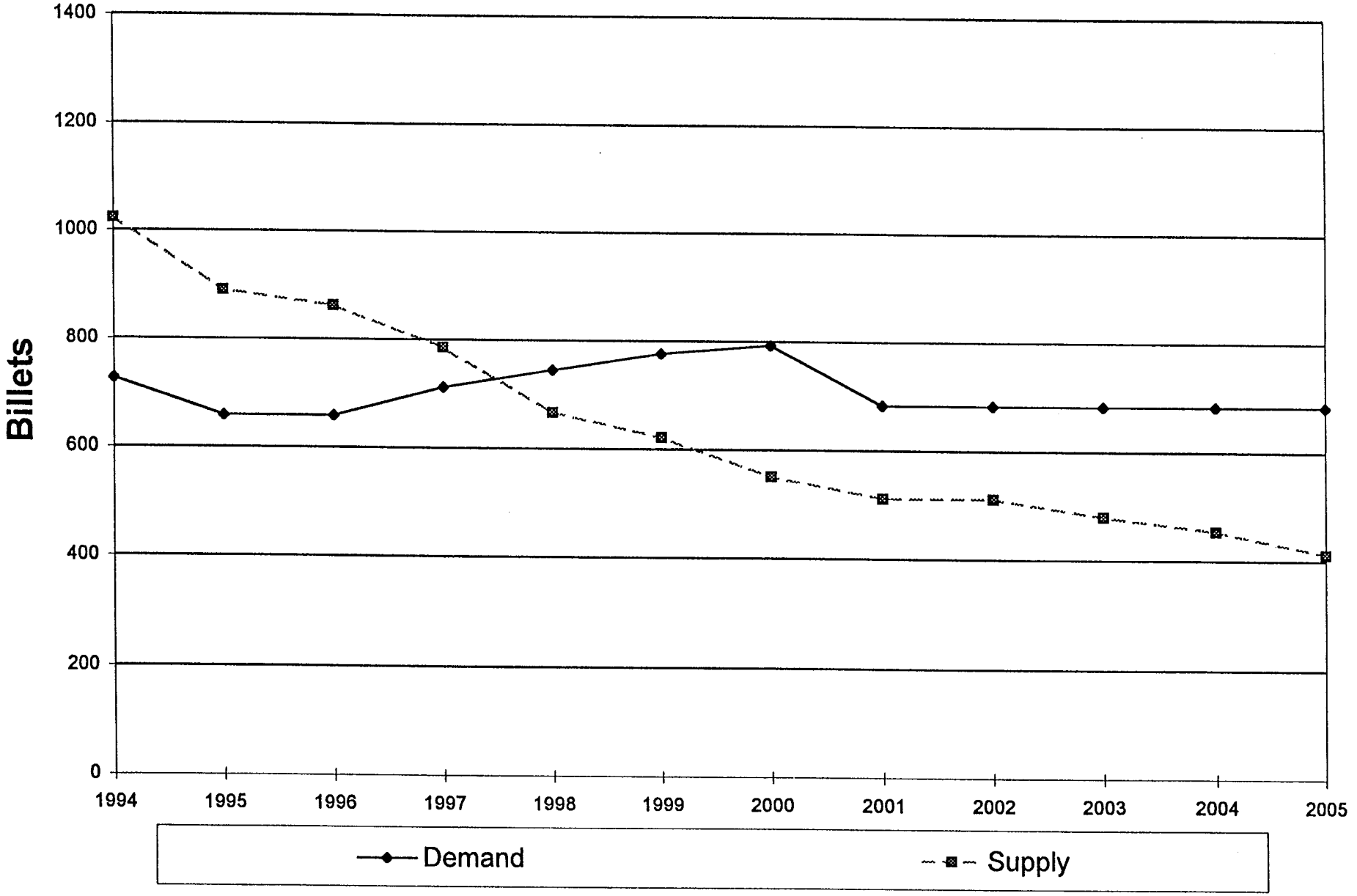


SCENARIO I
NO SUBSIDY

SKILLED UNLICENSED DECK

SUPPLY/DEMAND ANALYSIS

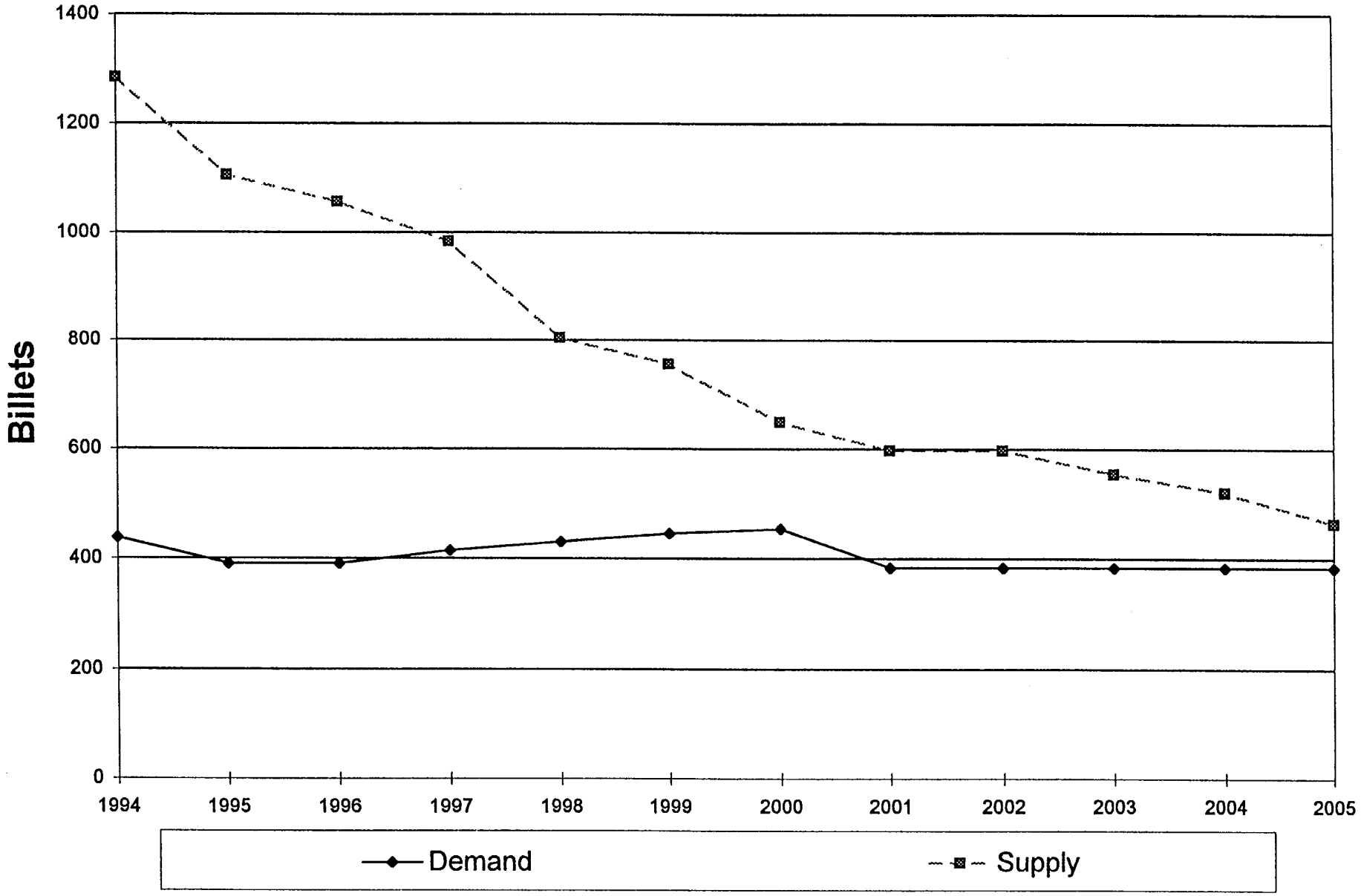
CASE 3
REDUCED CREW
GRAPH 12



SCENARIO I
NO SUBSIDY

ENGINEERING OFFICER
SUPPLY/DEMAND ANALYSIS

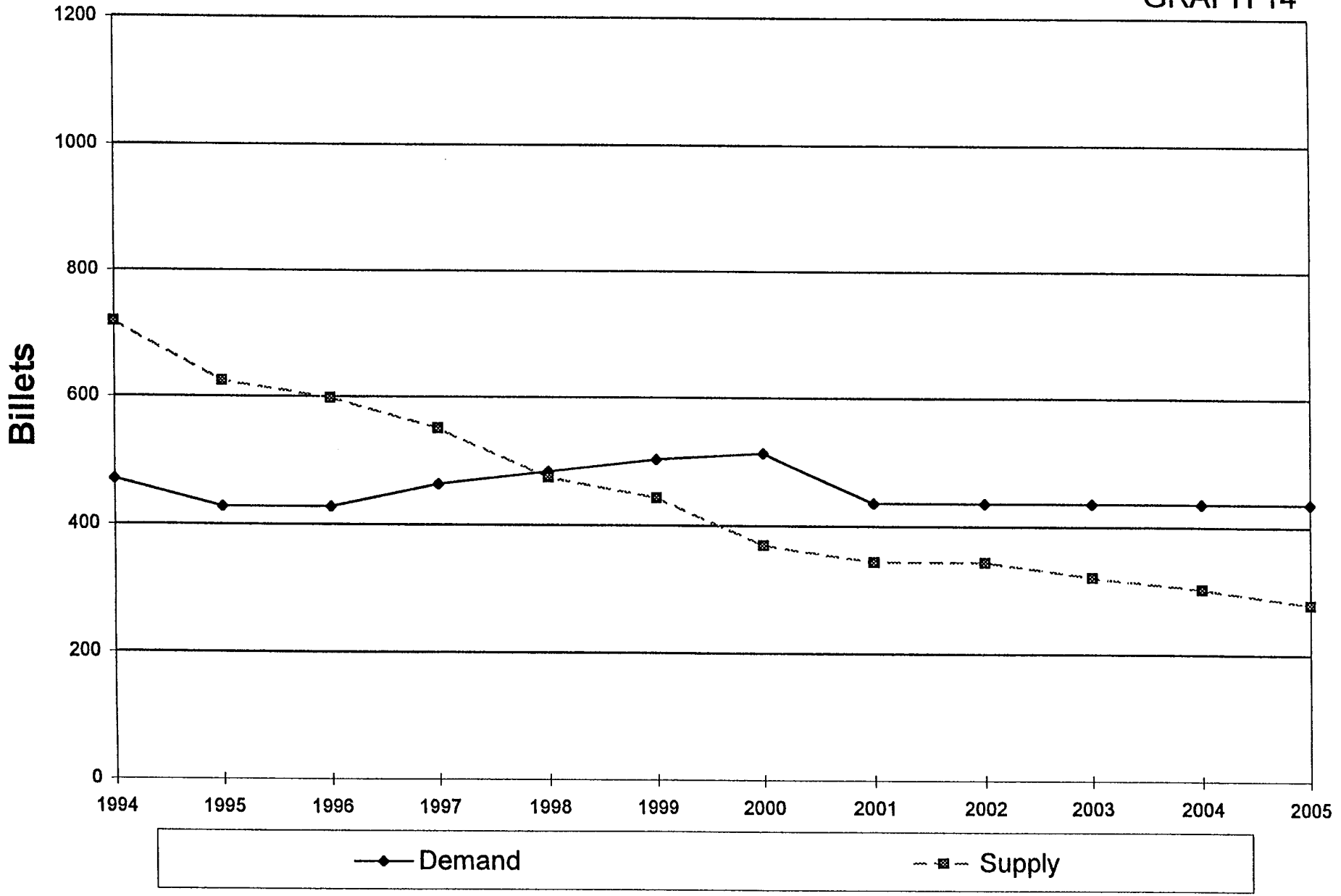
CASE 3
REDUCED CREW
GRAPH 13



SCENARIO I
NO SUBSIDY

SKILLED UNLICENSED ENGINEERING
SUPPLY/DEMAND ANALYSIS

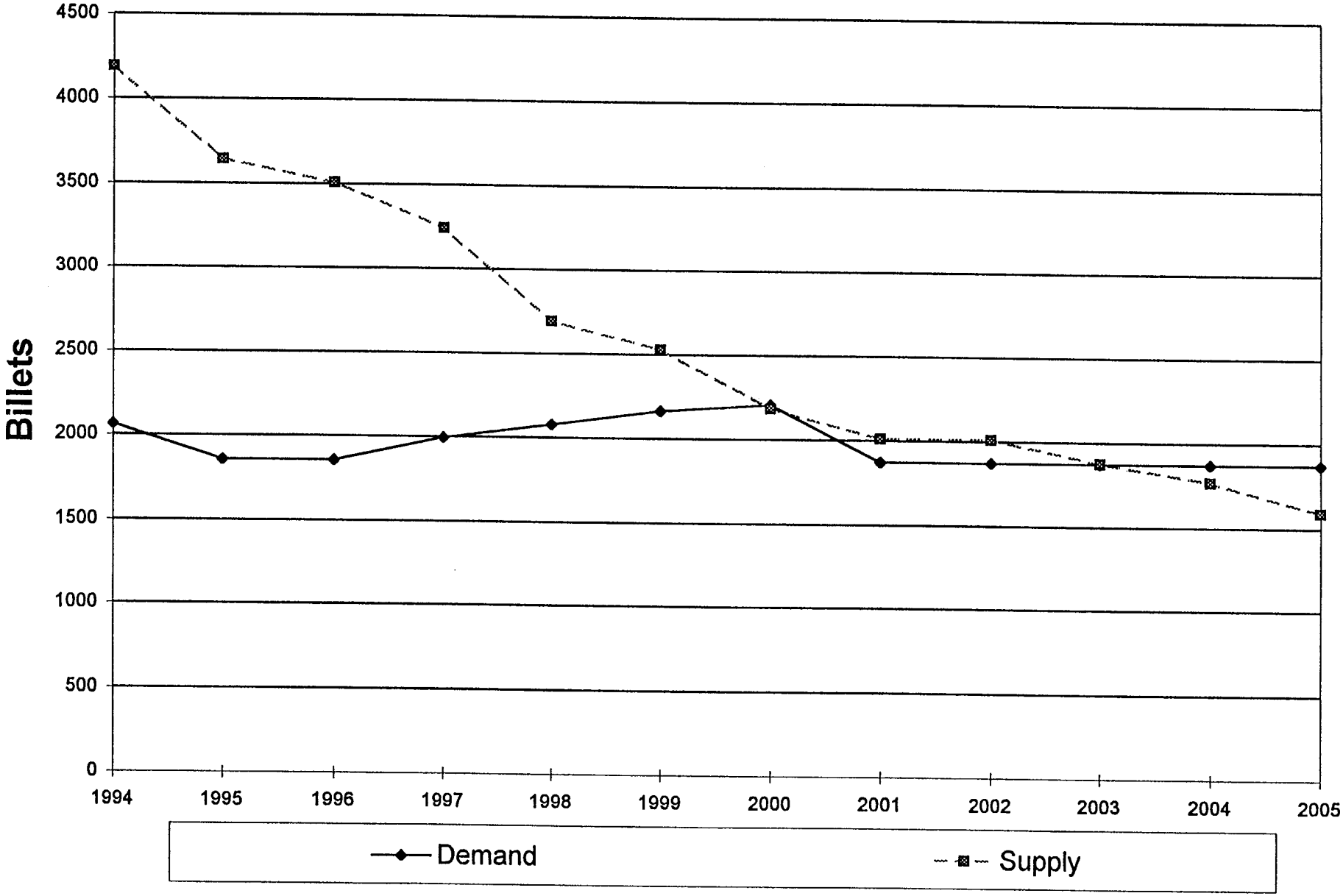
CASE 3
REDUCED CREW
GRAPH 14



SCENARIO I
NO SUBSIDY

SKILLED BILLETS
SUPPLY/DEMAND ANALYSIS

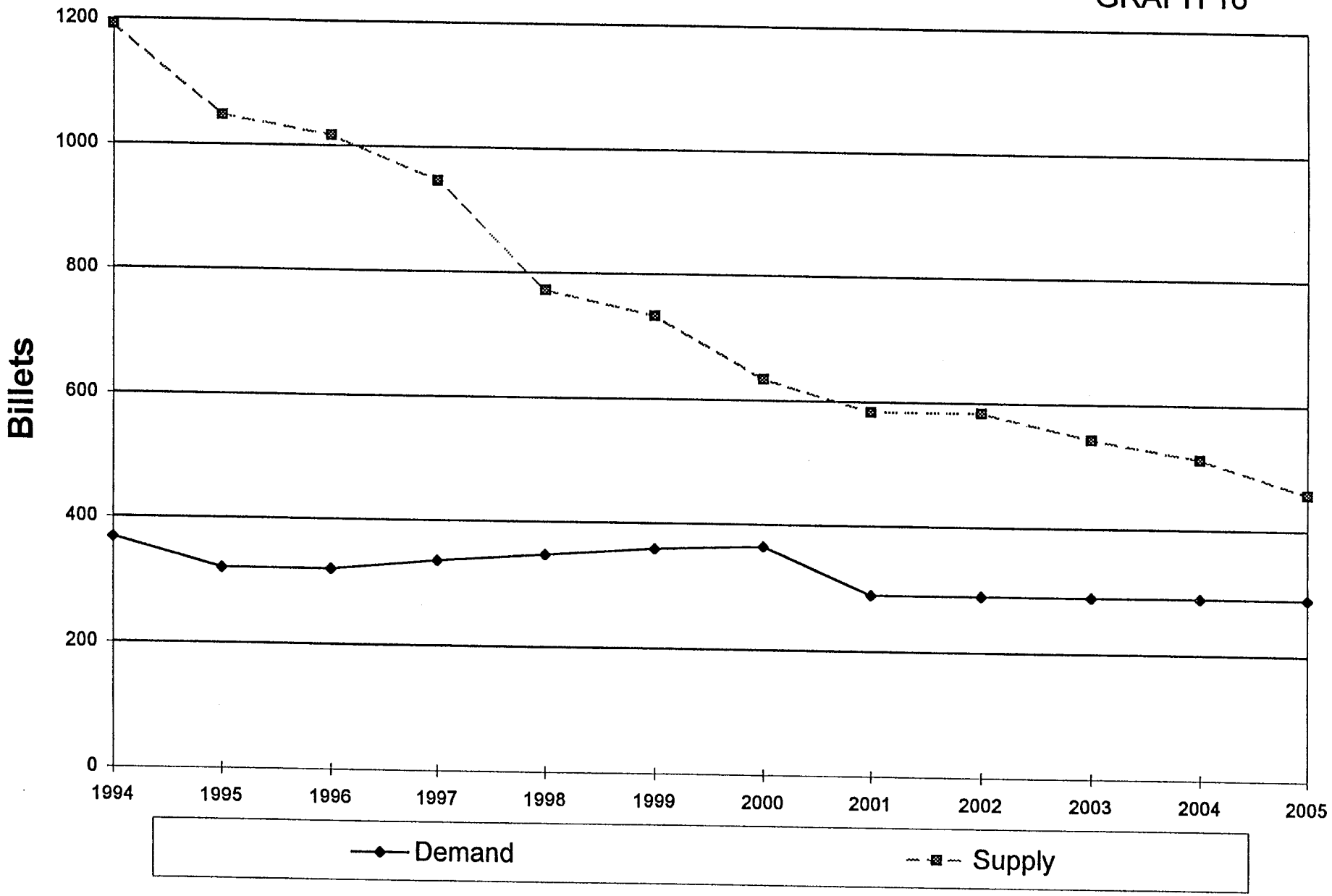
CASE 3
REDUCED CREW
GRAPH 15



SCENARIO I
NO SUBSIDY

DECK OFFICER
SUPPLY/DEMAND ANALYSIS

CASE 4
REDUCED CREW/ROS
GRAPH 16

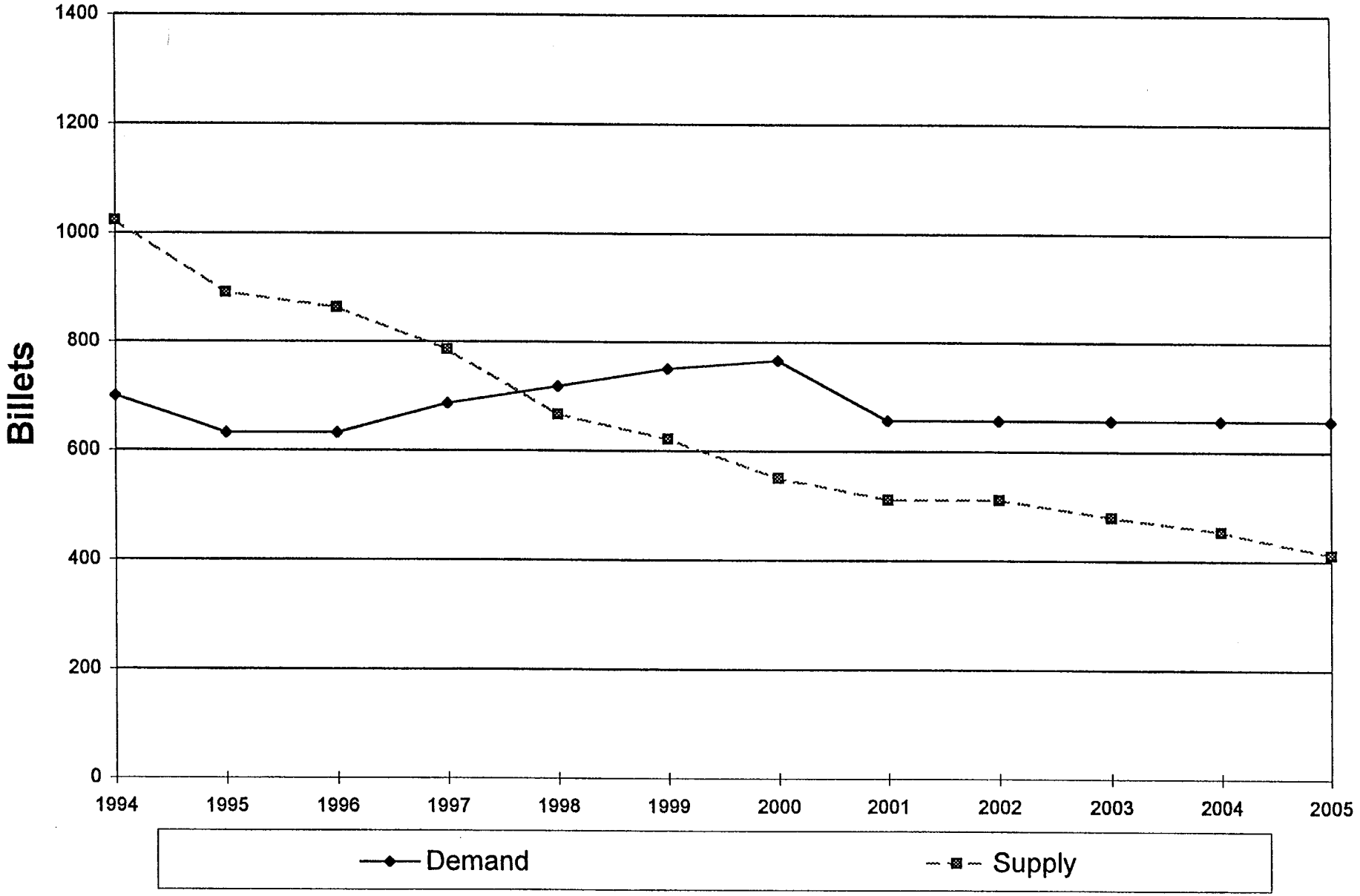


SCENARIO I
NO SUBSIDY

SKILLED UNLICENSED DECK

SUPPLY/DEMAND ANALYSIS

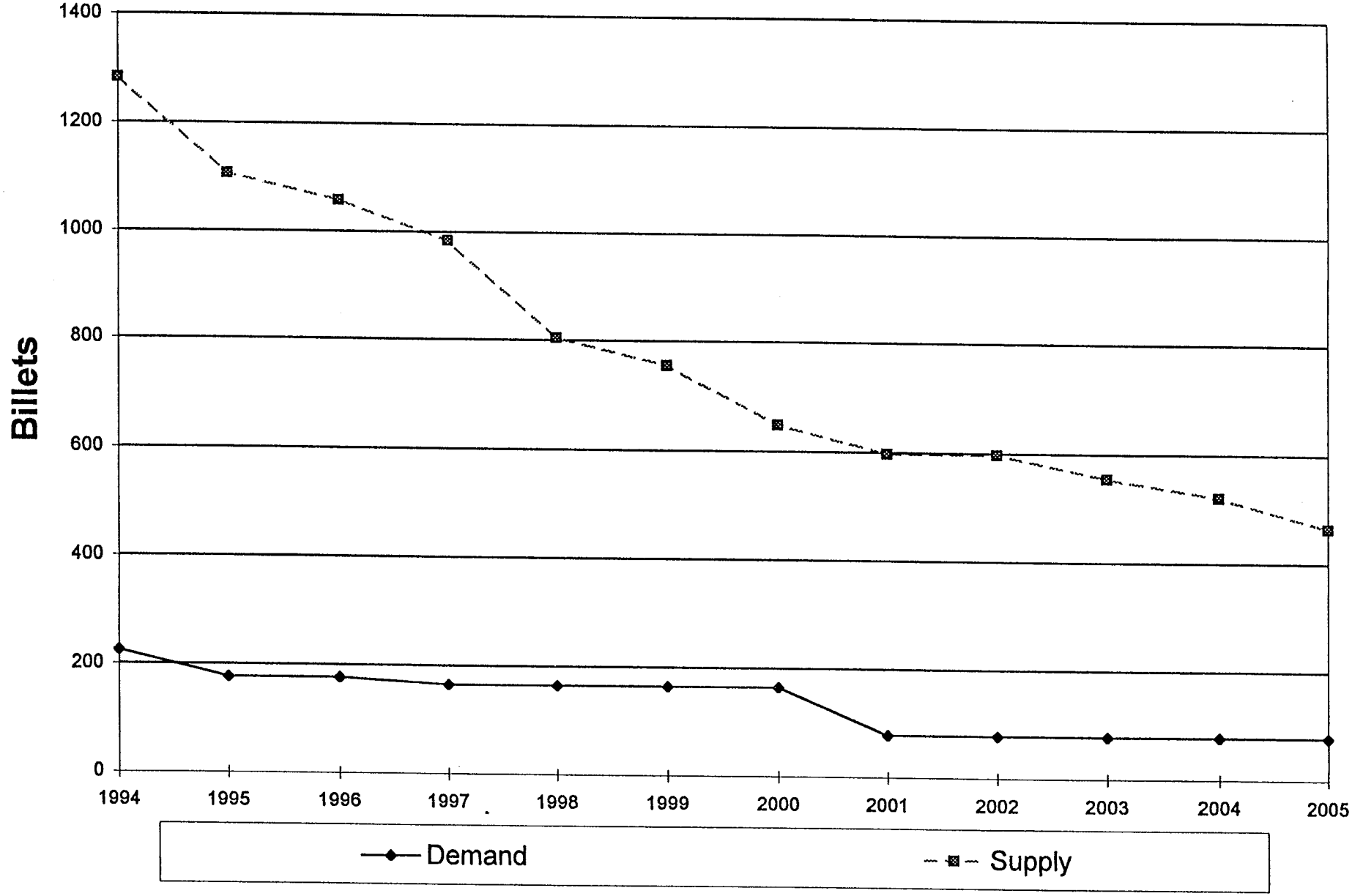
CASE 4
REDUCED CREW/ROS
GRAPH 17



SCENARIO I
NO SUBSIDY

ENGINEERING OFFICER
SUPPLY/DEMAND ANALYSIS

CASE 4
REDUCED CREW/ROS
GRAPH 18

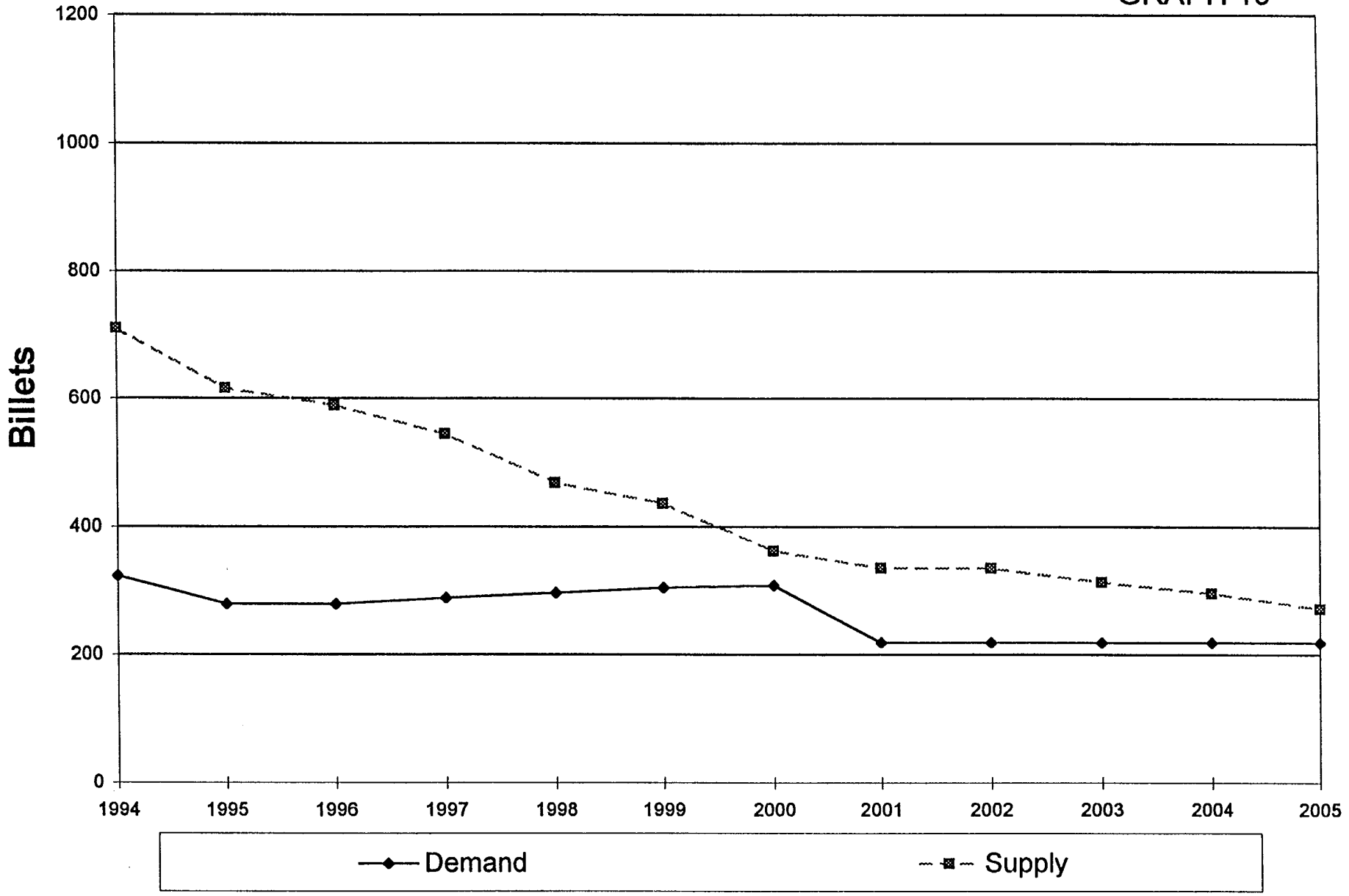


SCENARIO I
NO SUBSIDY

SKILLED UNLICENSED ENGINEERING

SUPPLY/DEMAND ANALYSIS

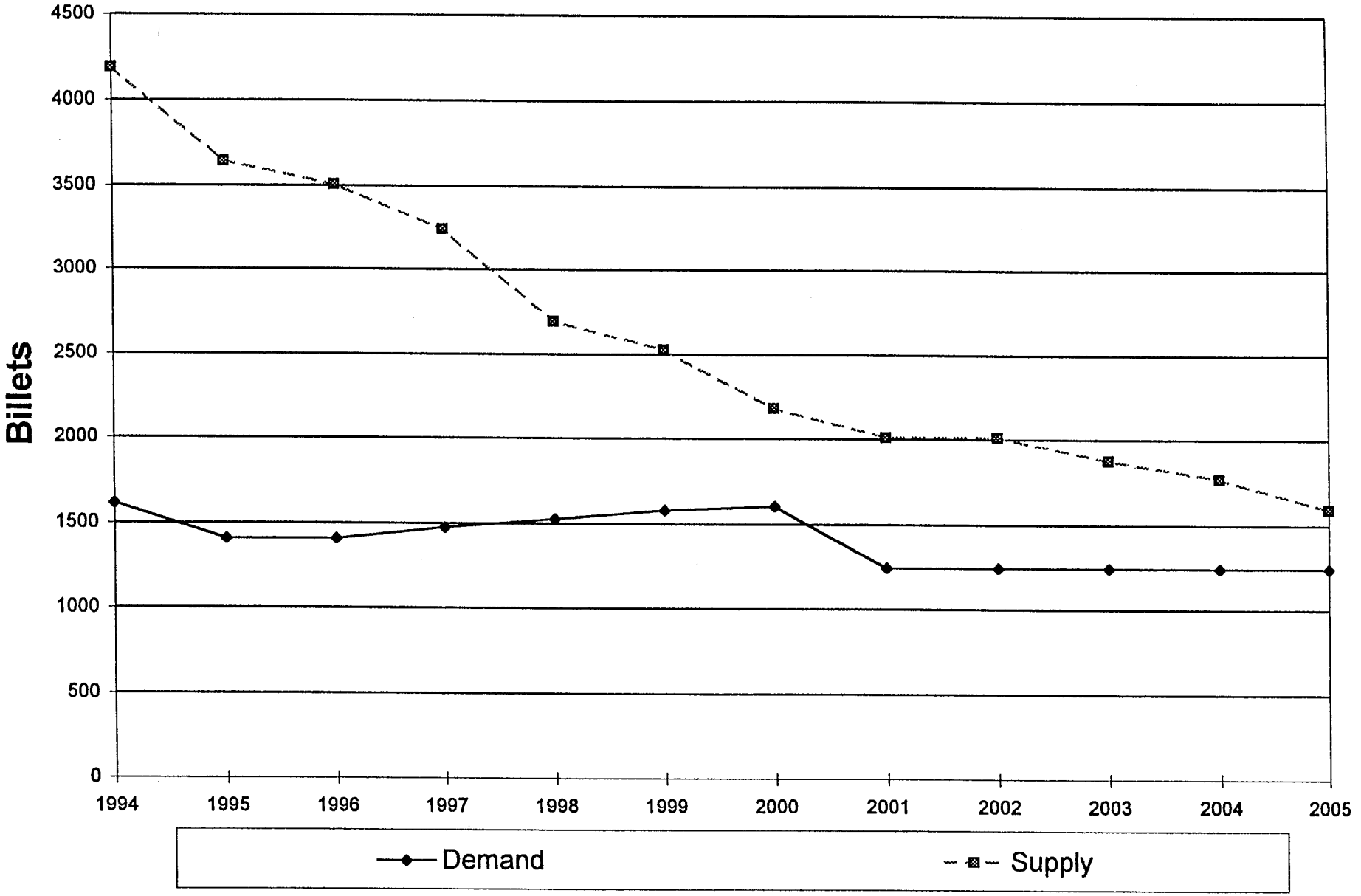
CASE 4
REDUCED CREW/ROS
GRAPH 19



SCENARIO I
NO SUBSIDY

SKILLED BILLETS
SUPPLY/DEMAND ANALYSIS

CASE 4
REDUCED CREW/ROS
GRAPH 20



Appendix G

GRAPHS AND SUPPLY/DEMAND DETAIL FOR SCENARIO II - MARITIME SECURITY PROGRAM ENACTED

Crewing Supply/Demand Detail for 2001 - Case 1, Full Crew

	Deck Officers	Unlicensed Deck	Engine Officers	Unlicensed Engineers
MARINER DEMAND				
LMSR	44	110	11	44
FSS	48	56	72	72
ROS-4/5	251	478	288	432
RRF-10/20/30	125	247	126	191
TOTAL	468	891	495	739
MARINER SUPPLY	801	657	818	428
SHORTFALL/SURPLUS	+333	-231	+323	-311

Unlicensed supply/demand do not include unskilled billets such as Ordinary Seaman or Wiper

Crewing Supply/Demand Detail for 2001 - Case 2, Full Crew with Reduced Operating Status Crews

	Deck Officers	Unlicensed Deck	Engine Officers	Unlicensed Engineers
MARINER DEMAND				
LMSR	44	110	11	44
FSS	48	56	72	72
ROS-4/5	171	458	110	222
RRF-10/20/30	125	247	126	191
TOTAL	388	871	319	529
MARINER SUPPLY	801	657	818	428
SHORTFALL/SURPLUS	+413	-211	+499	-101

Unlicensed supply/demand do not include unskilled billets such as Ordinary Seaman or Wiper

Crewing Supply/Demand Detail for 2001 - Case 3, Reduced Crew

	Deck Officers	Unlicensed Deck	Engine Officers	Unlicensed Engineers
MARINER DEMAND				
LMSR	33	88	0	22
FSS	32	56	48	48
ROS-4/5	207	362	236	256
RRF-10/20/30	100	176	100	110
TOTAL	372	682	384	436
MARINER SUPPLY	801	657	818	428
SHORTFALL/SURPLUS	+429	-25	+434	-8

Unlicensed supply/demand do not include unskilled billets such as Ordinary Seaman or Wiper

Crewing Supply/Demand Detail for 2001 - Case 4, Reduced Crew with Reduced Operating Status Crews

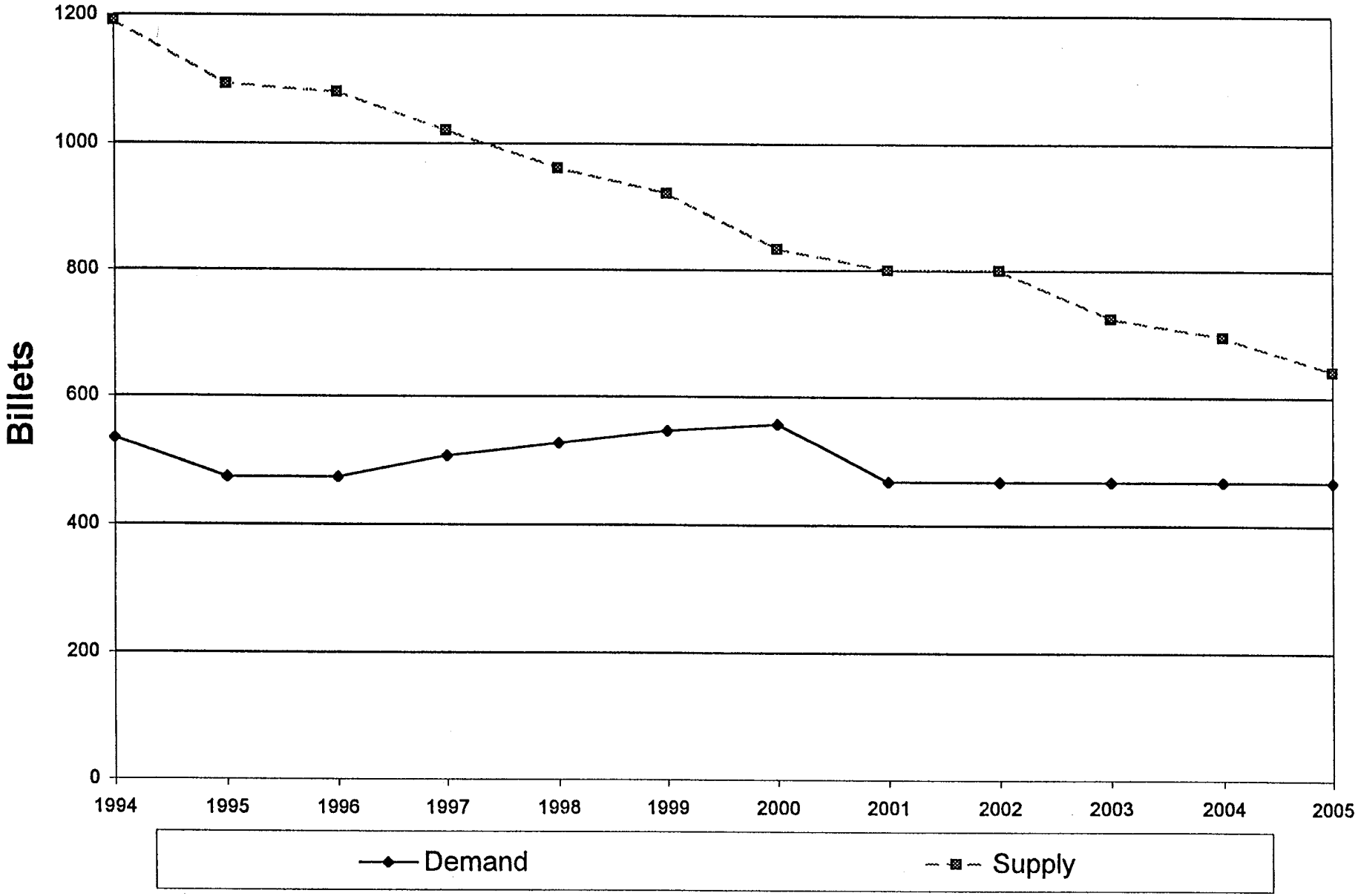
	Deck Officers	Unlicensed Deck	Engine Officers	Unlicensed Engineers
MARINER DEMAND				
LMSR	33	88	0	22
FSS	32	56	48	48
ROS-4/5	127	342	24	46
RRF-10/20/30	100	176	100	110
TOTAL	292	662	172	226
MARINER SUPPLY	801	657	818	428
SHORTFALL/SURPLUS	+509	-5	+646	+202

Unlicensed supply/demand do not include unskilled billets such as Ordinary Seaman or Wiper

SCENARIO II
SUBSIDY

DECK OFFICER
SUPPLY/DEMAND ANALYSIS

CASE 1
FULL CREW
GRAPH 1

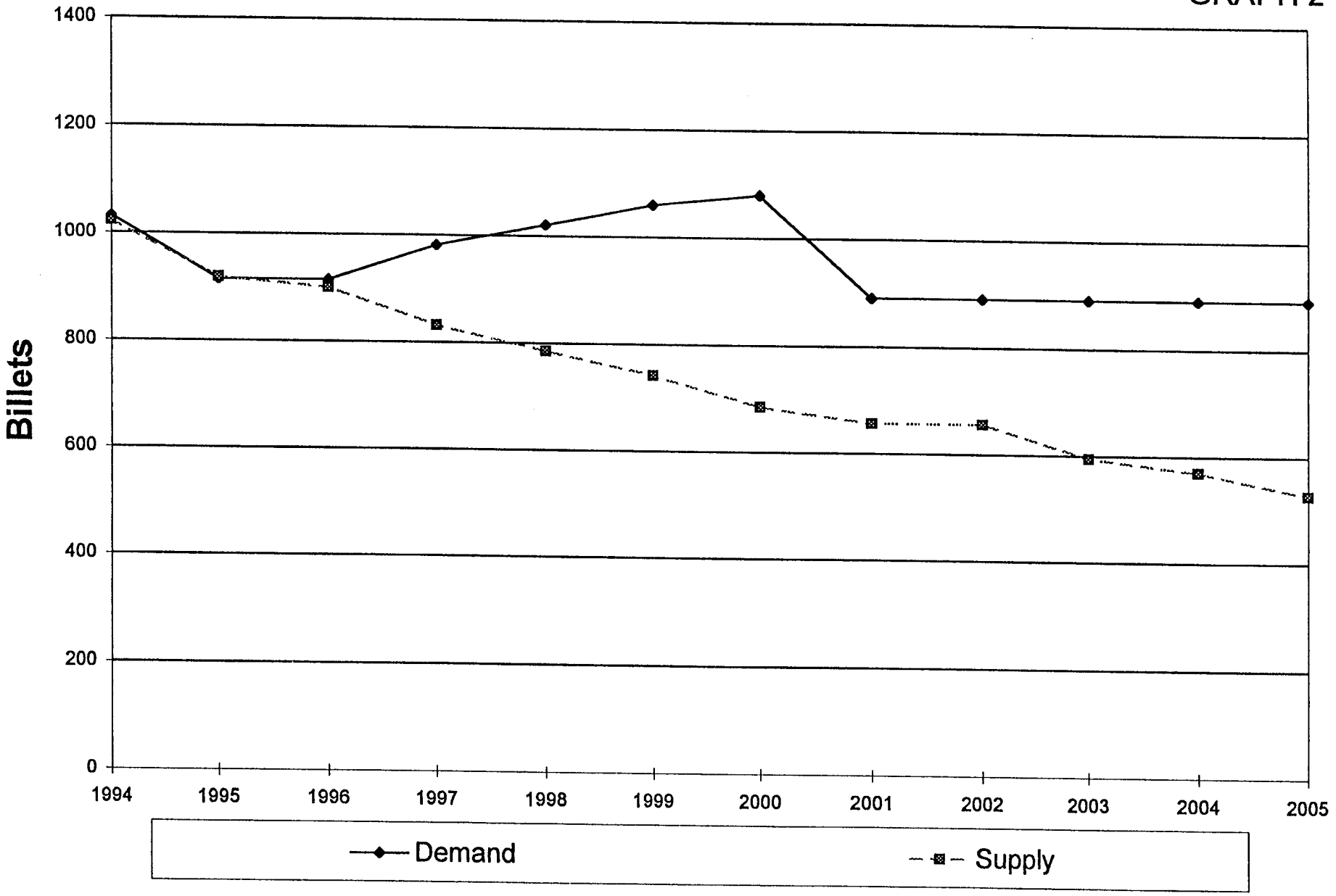


SCENARIO II
SUBSIDY

SKILLED UNLICENSED DECK

SUPPLY/DEMAND ANALYSIS

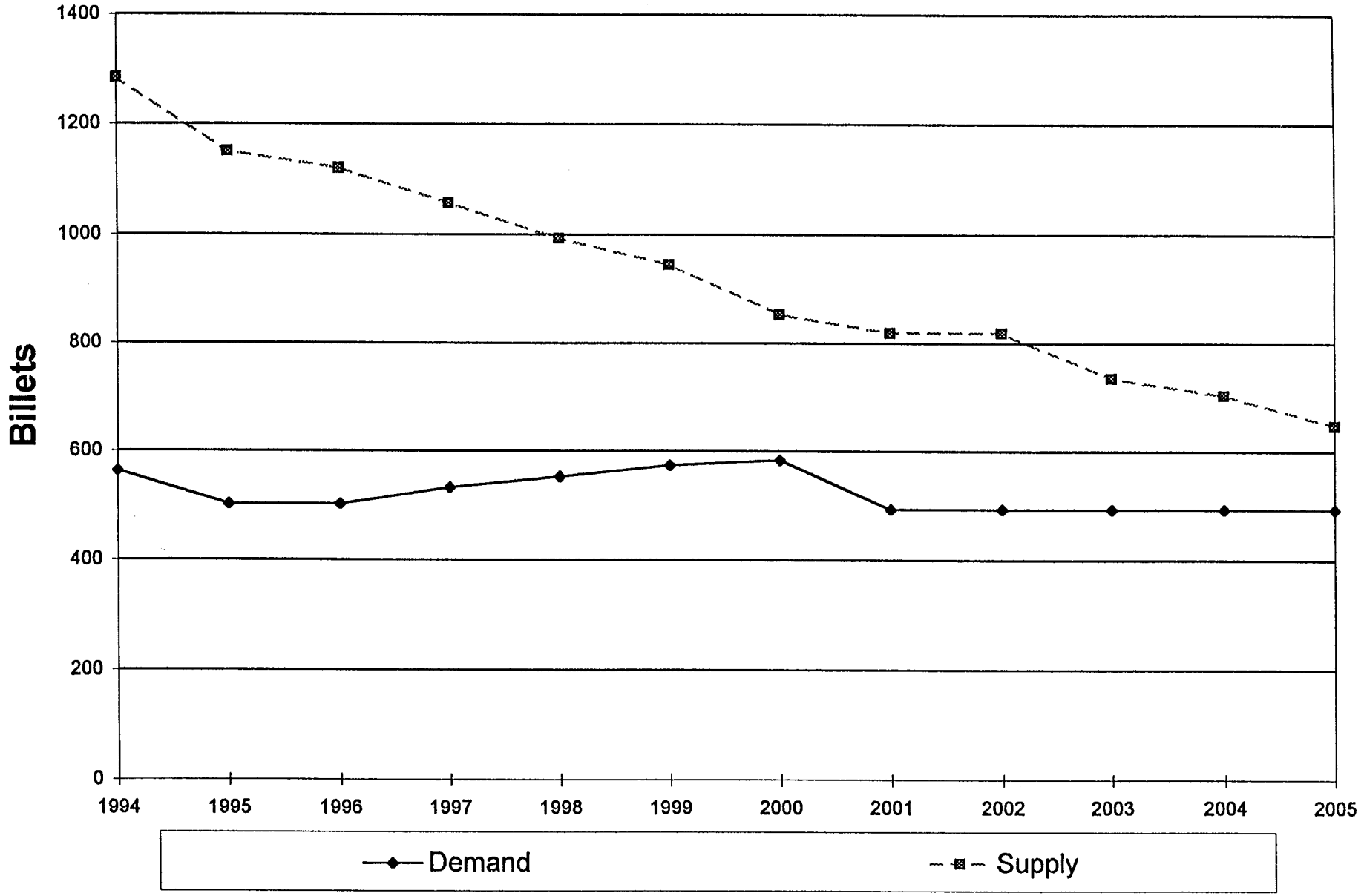
CASE 1
FULL CREW
GRAPH 2



SCENARIO II
SUBSIDY

ENGINEERING OFFICER
SUPPLY/DEMAND ANALYSIS

CASE 1
FULL CREW
GRAPH 3

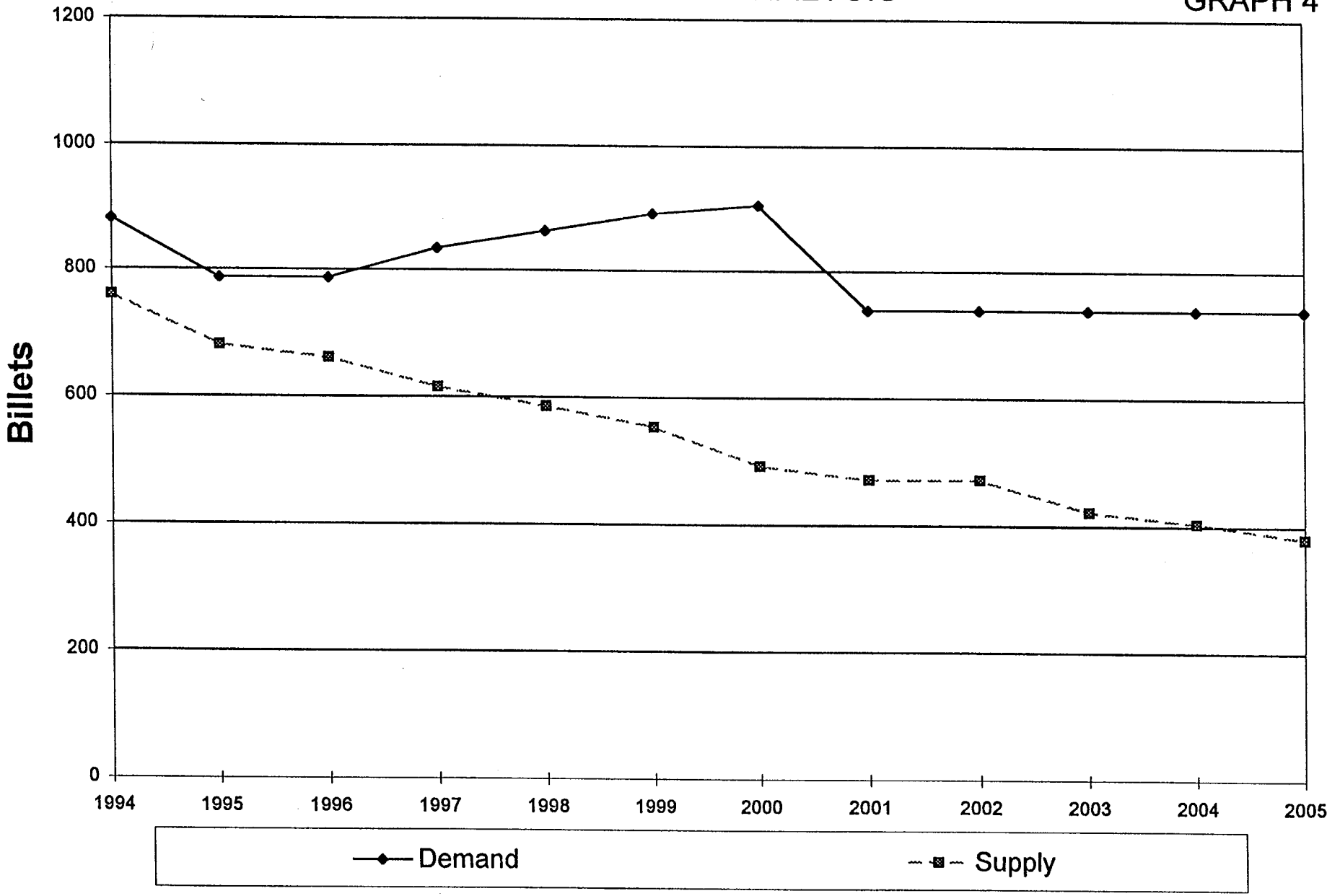


SCENARIO II
SUBSIDY

SKILLED UNLICENSED ENGINEERING

SUPPLY/DEMAND ANALYSIS

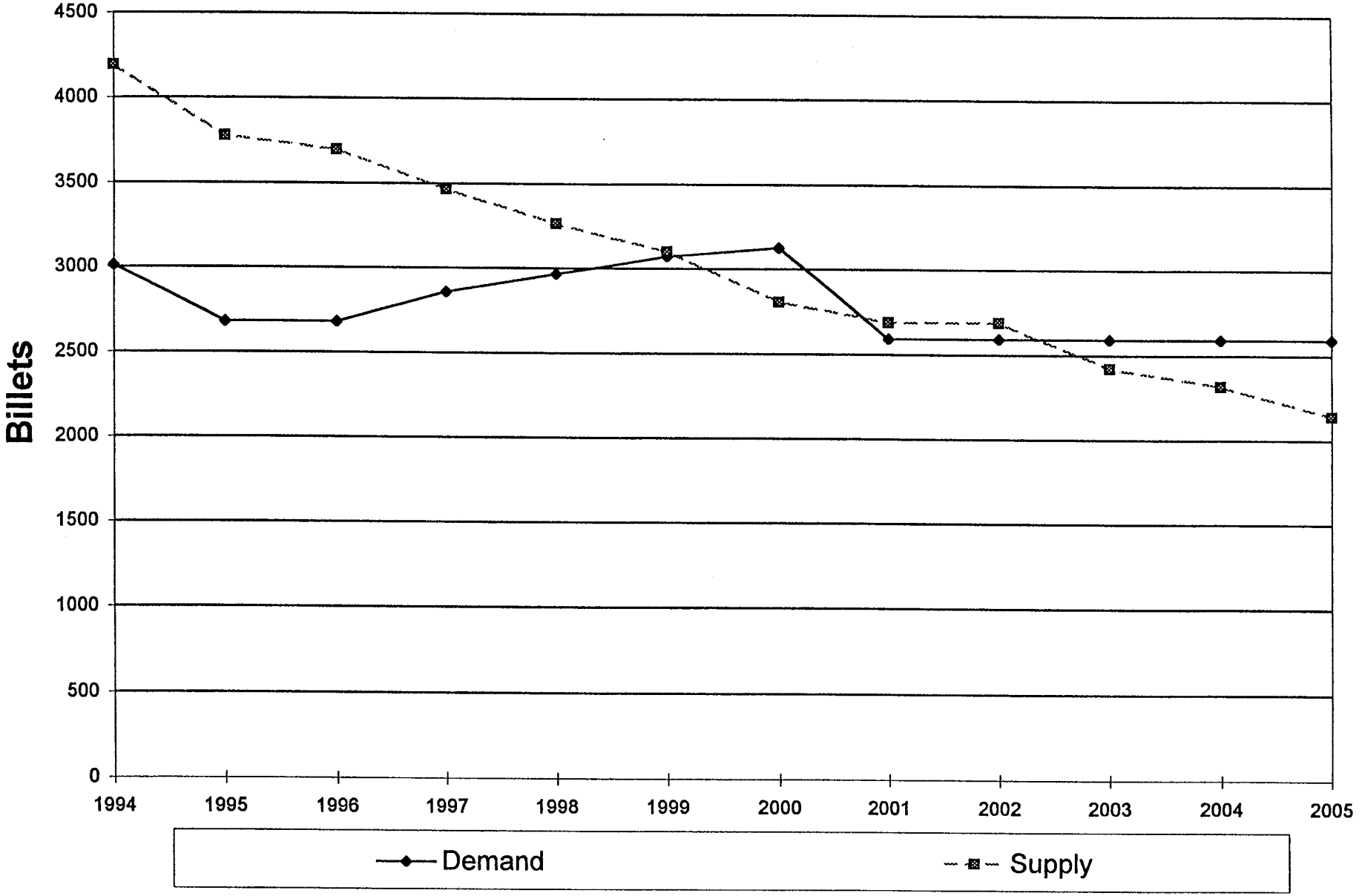
CASE 1
FULL CREW
GRAPH 4



SCENARIO II
SUBSIDY

SKILLED BILLETS
SUPPLY/DEMAND ANALYSIS

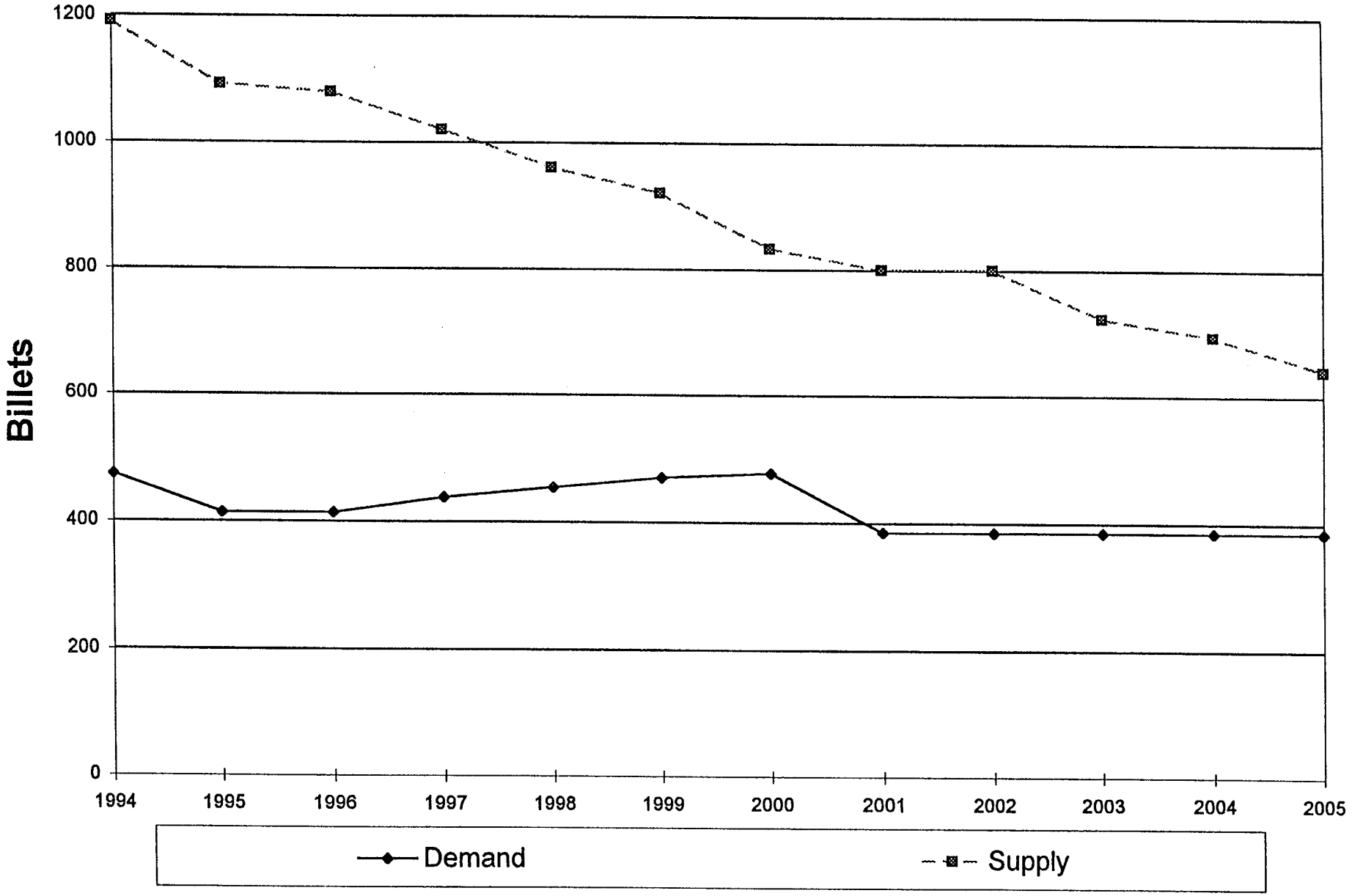
CASE 1
FULL CREW
GRAPH 5



SCENARIO II
SUBSIDY

DECK OFFICER
SUPPLY/DEMAND ANALYSIS

CASE 2
FULL CREW/ROS
GRAPH 6

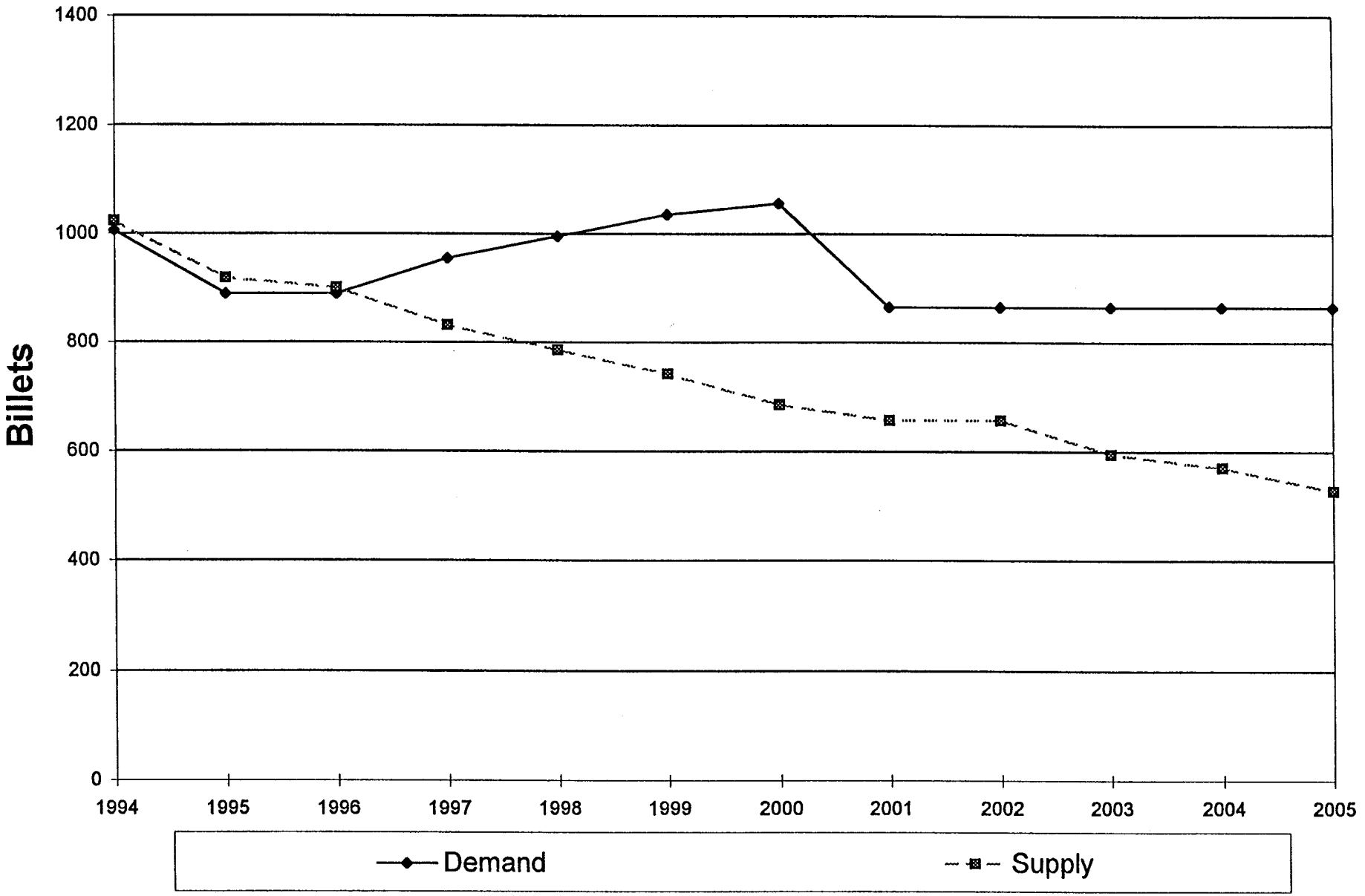


SCENARIO II
SUBSIDY

SKILLED UNLICENSED DECK

SUPPLY/DEMAND ANALYSIS

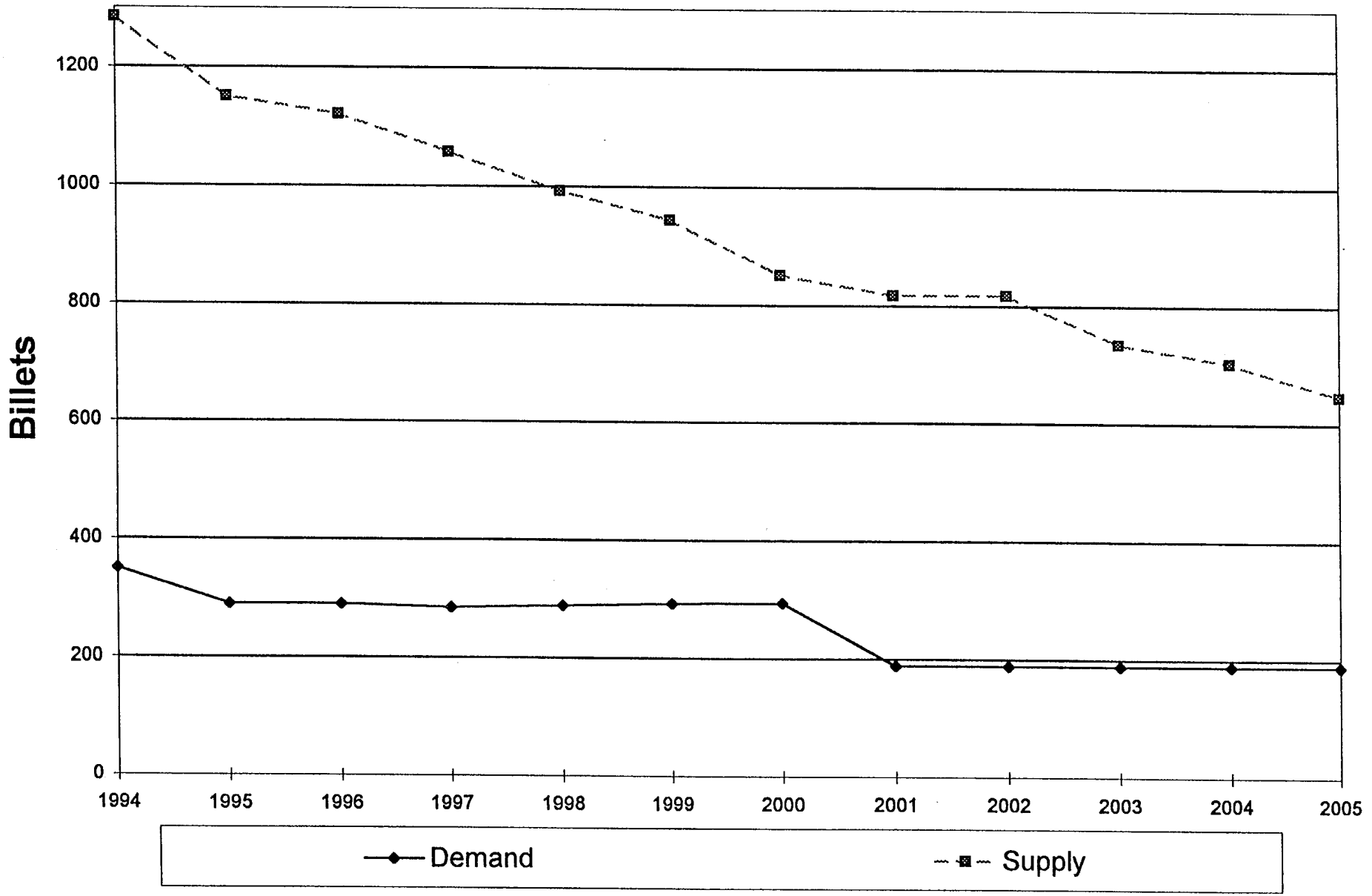
CASE 2
FULL CREW/ROS
GRAPH 7



SCENARIO II
SUBSIDY

ENGINEERING OFFICER
SUPPLY/DEMAND ANALYSIS

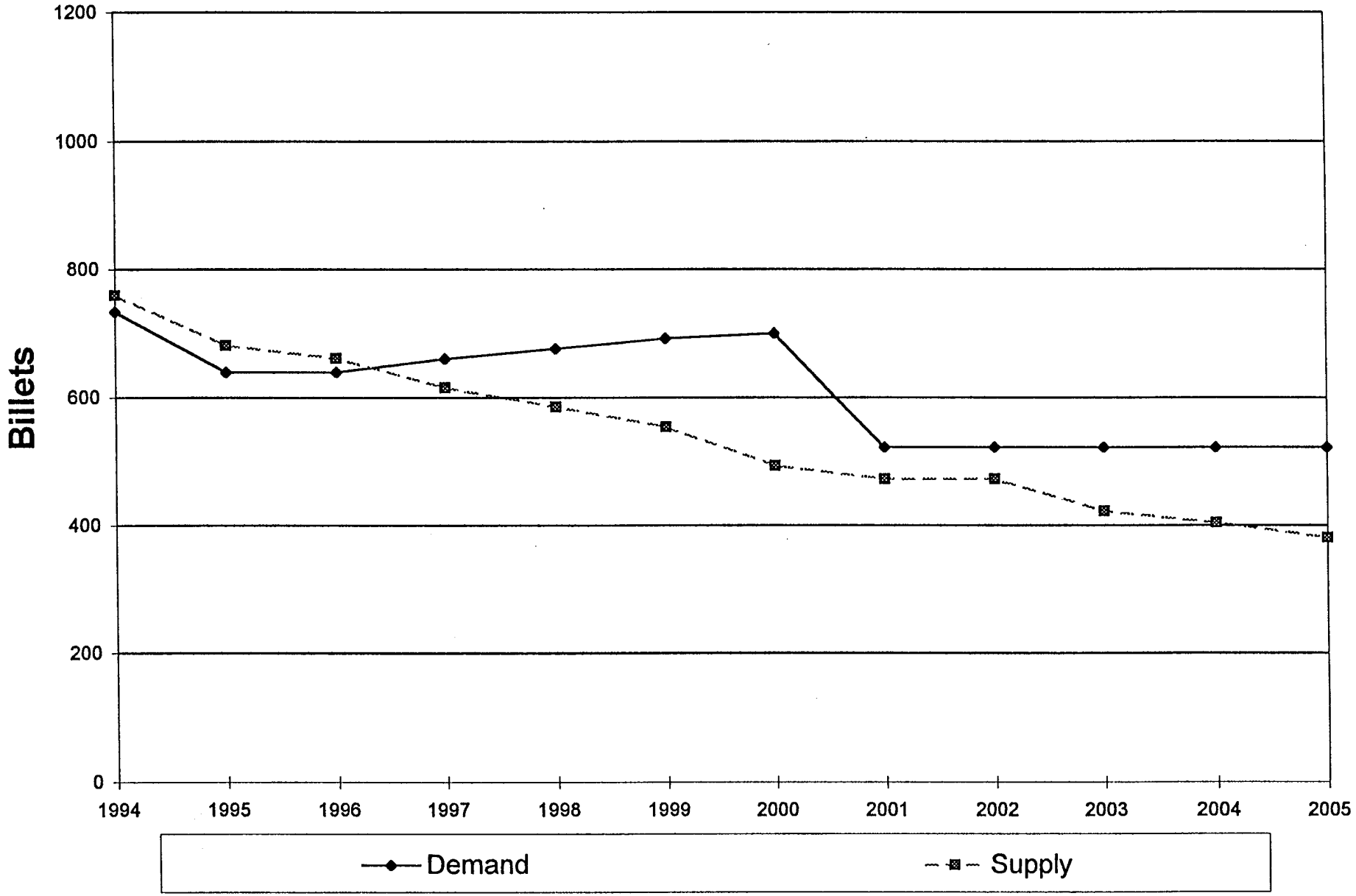
CASE 2
FULL CREW/ROS
GRAPH 8



SCENARIO II
SUBSIDY

SKILLED UNLICENSED ENGINEERING
SUPPLY/DEMAND ANALYSIS

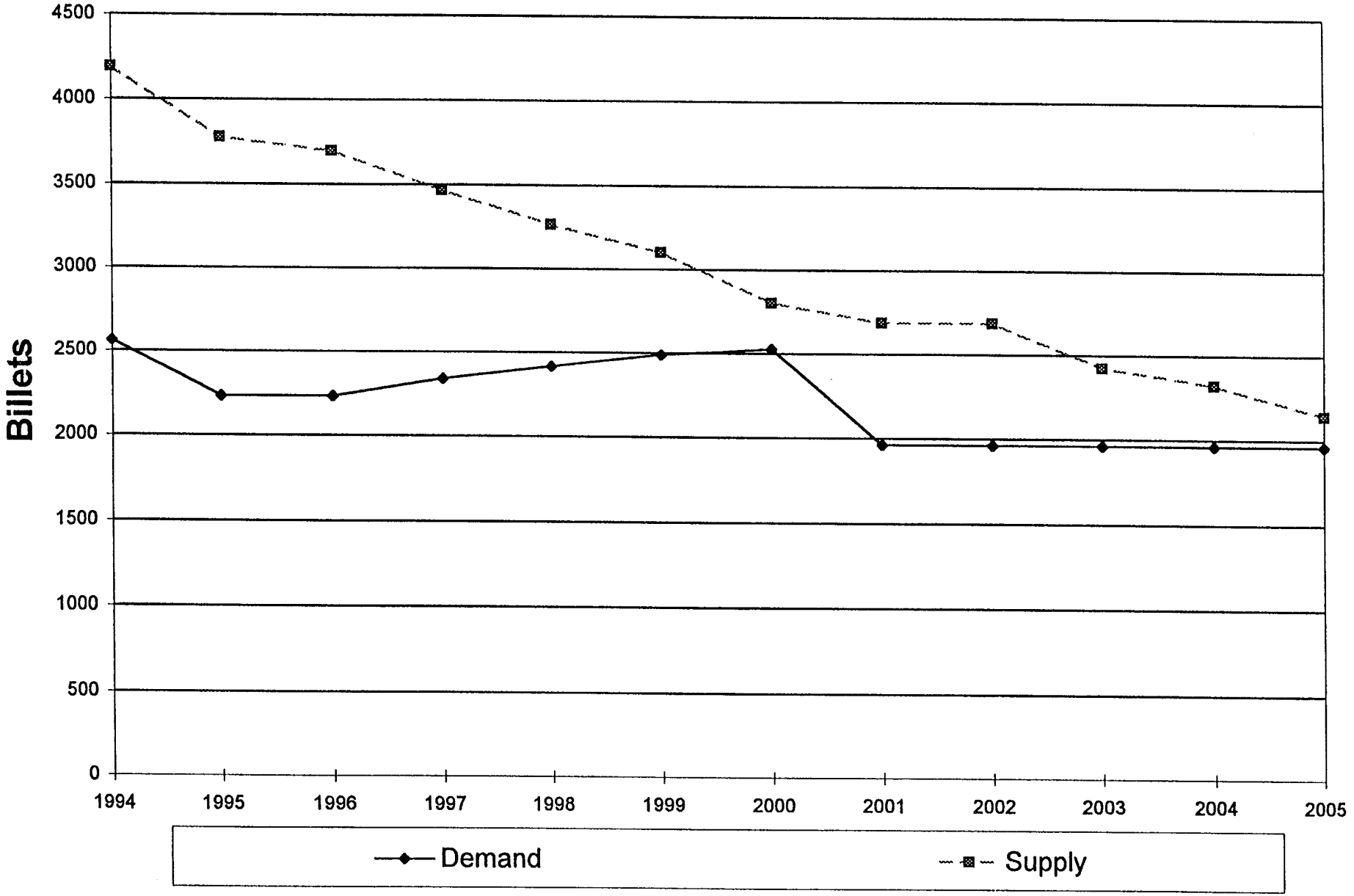
CASE 2
FULL CREW/ROS
GRAPH 9



SCENARIO II
SUBSIDY

SKILLED BILLETS
SUPPLY/DEMAND ANALYSIS

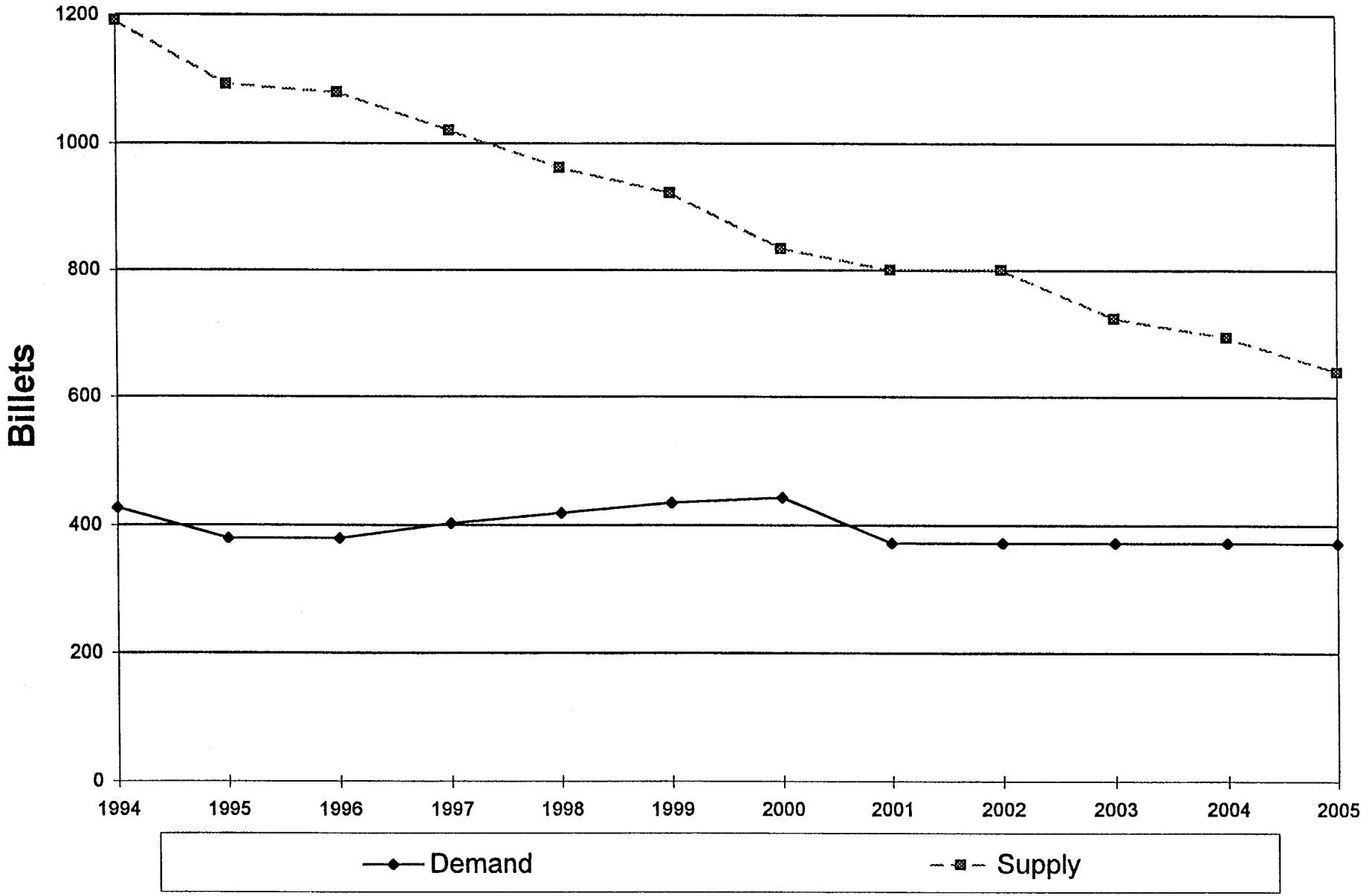
CASE 2
FULL CREW/ROS
GRAPH 10



SCENARIO II
SUBSIDY

DECK OFFICER
SUPPLY/DEMAND ANALYSIS

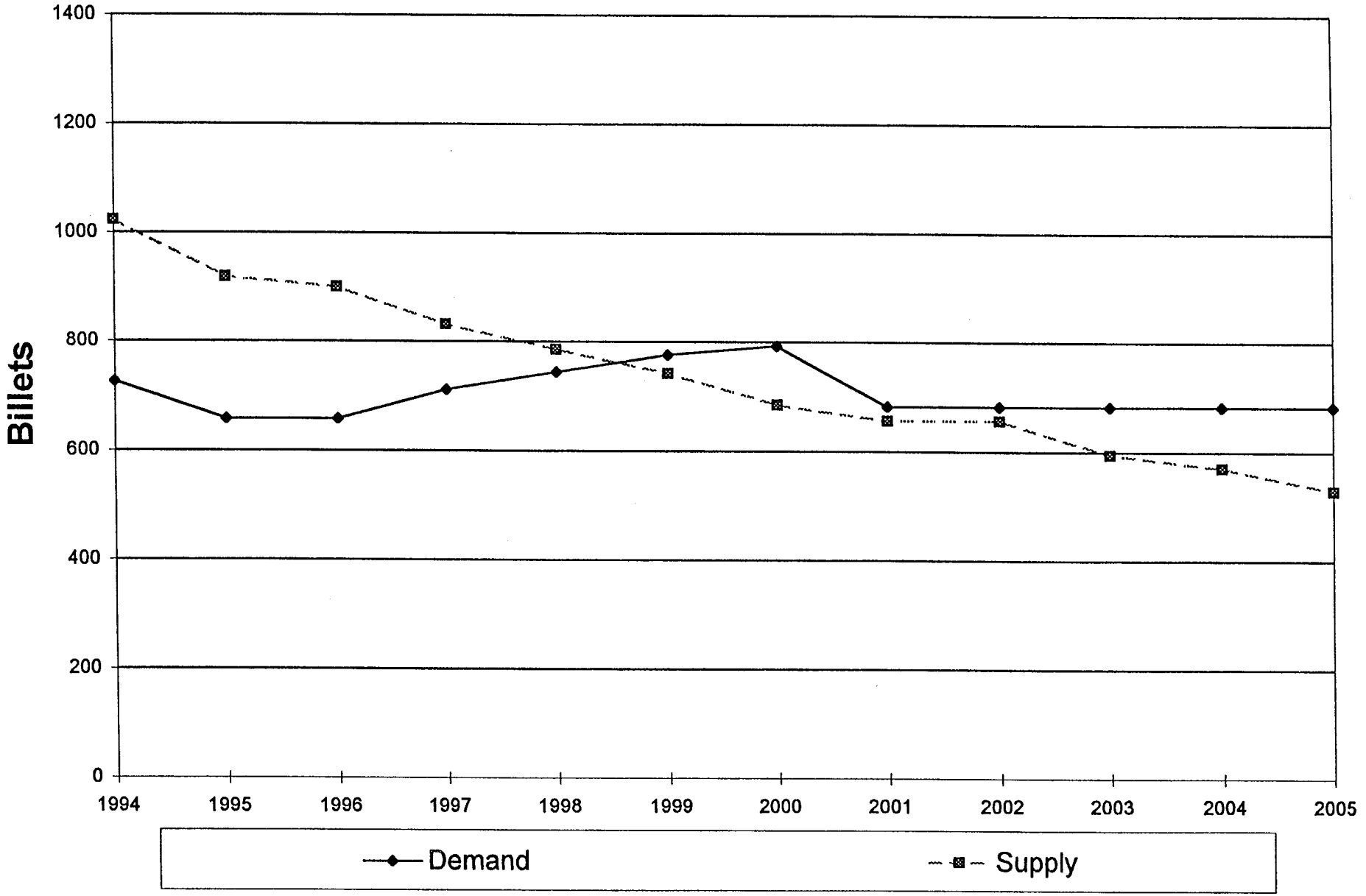
CASE 3
REDUCED CREW
GRAPH 11



SCENARIO II
SUBSIDY

SKILLED UNLICENSED DECK
SUPPLY/DEMAND ANALYSIS

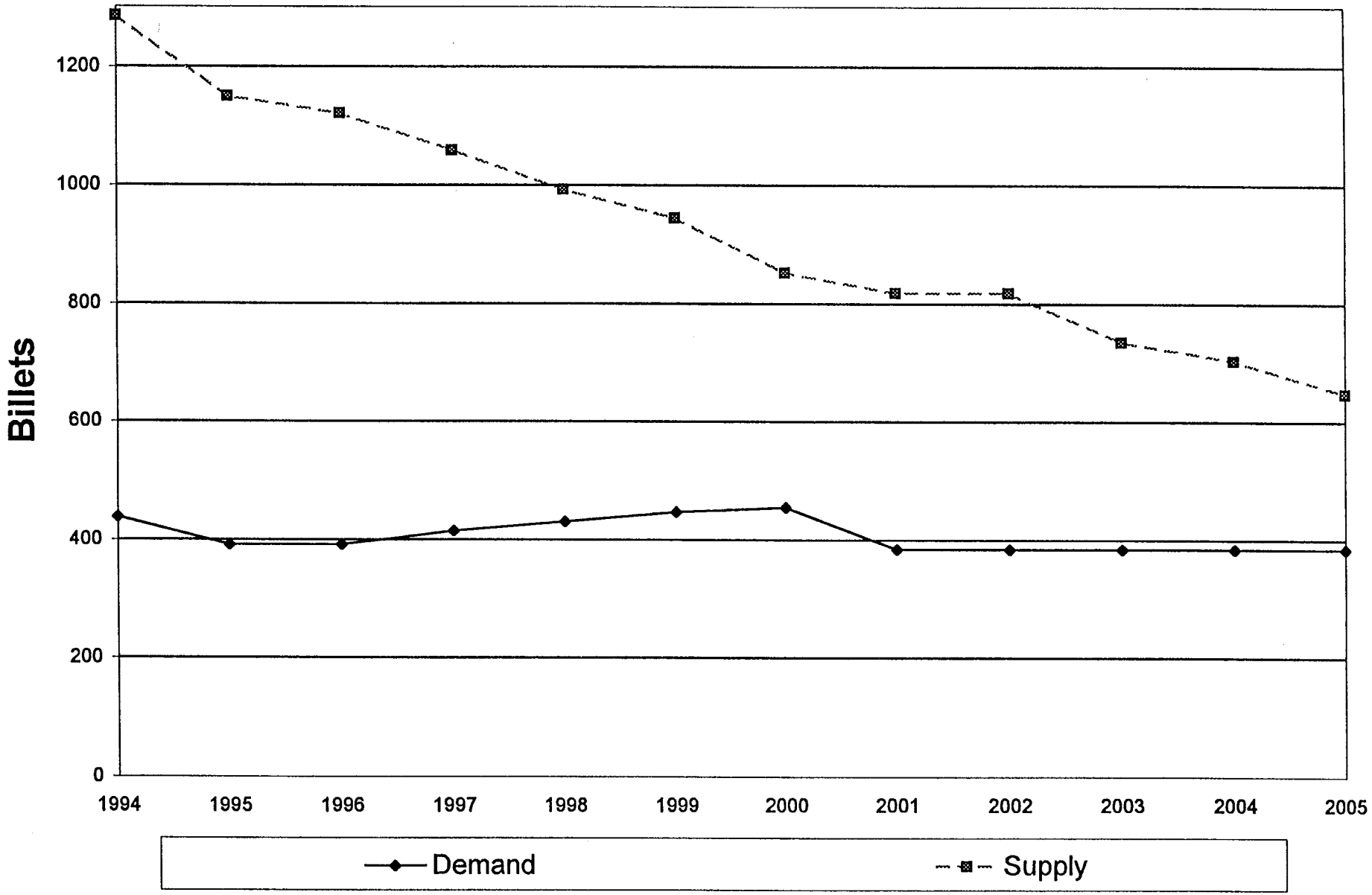
CASE 3
REDUCED CREW
GRAPH 12



SCENARIO II
SUBSIDY

ENGINEERING OFFICER
SUPPLY/DEMAND ANALYSIS

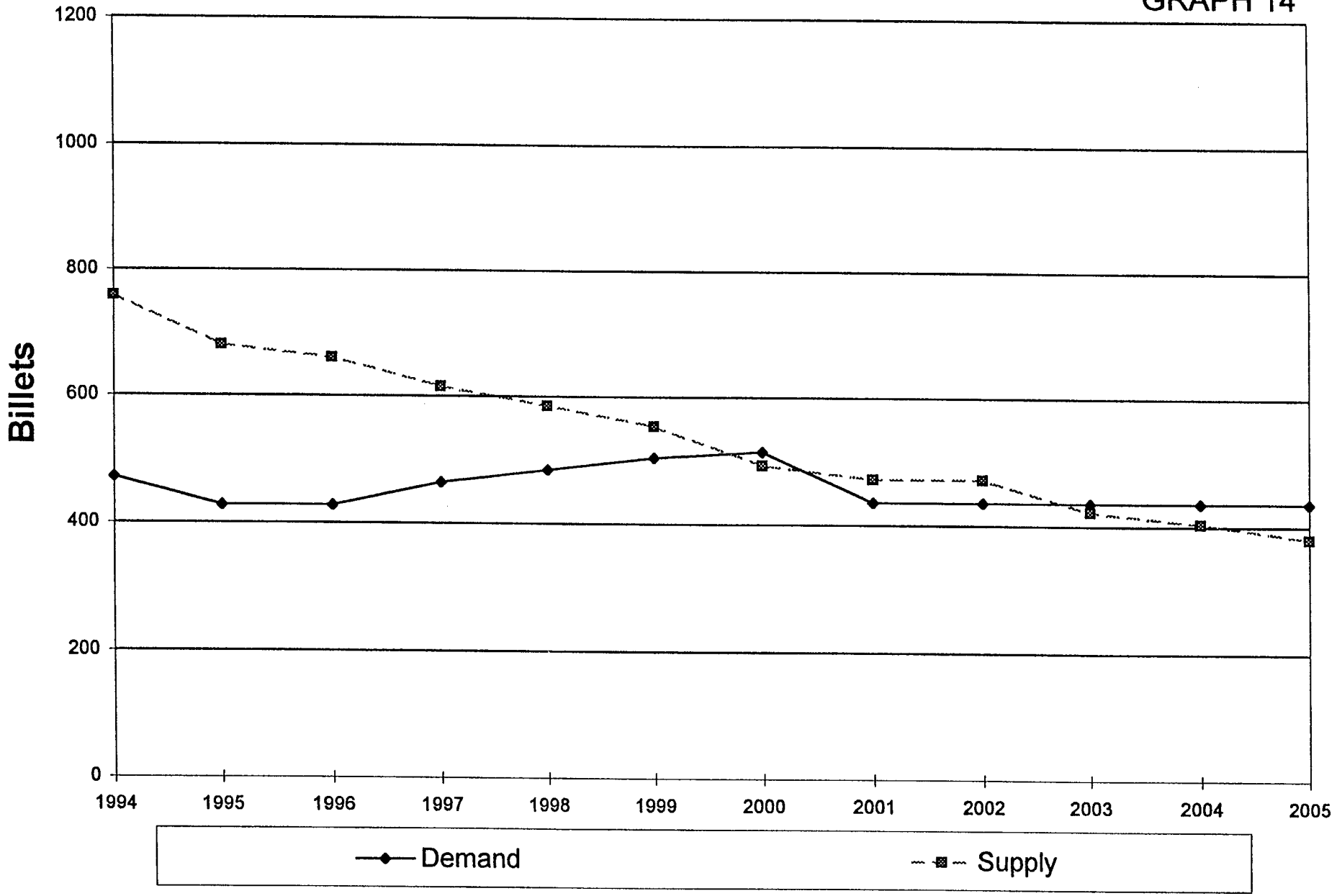
CASE 3
REDUCED CREW
GRAPH 13



SCENARIO II
SUBSIDY

SKILLED UNLICENSED ENGINEERING
SUPPLY/DEMAND ANALYSIS

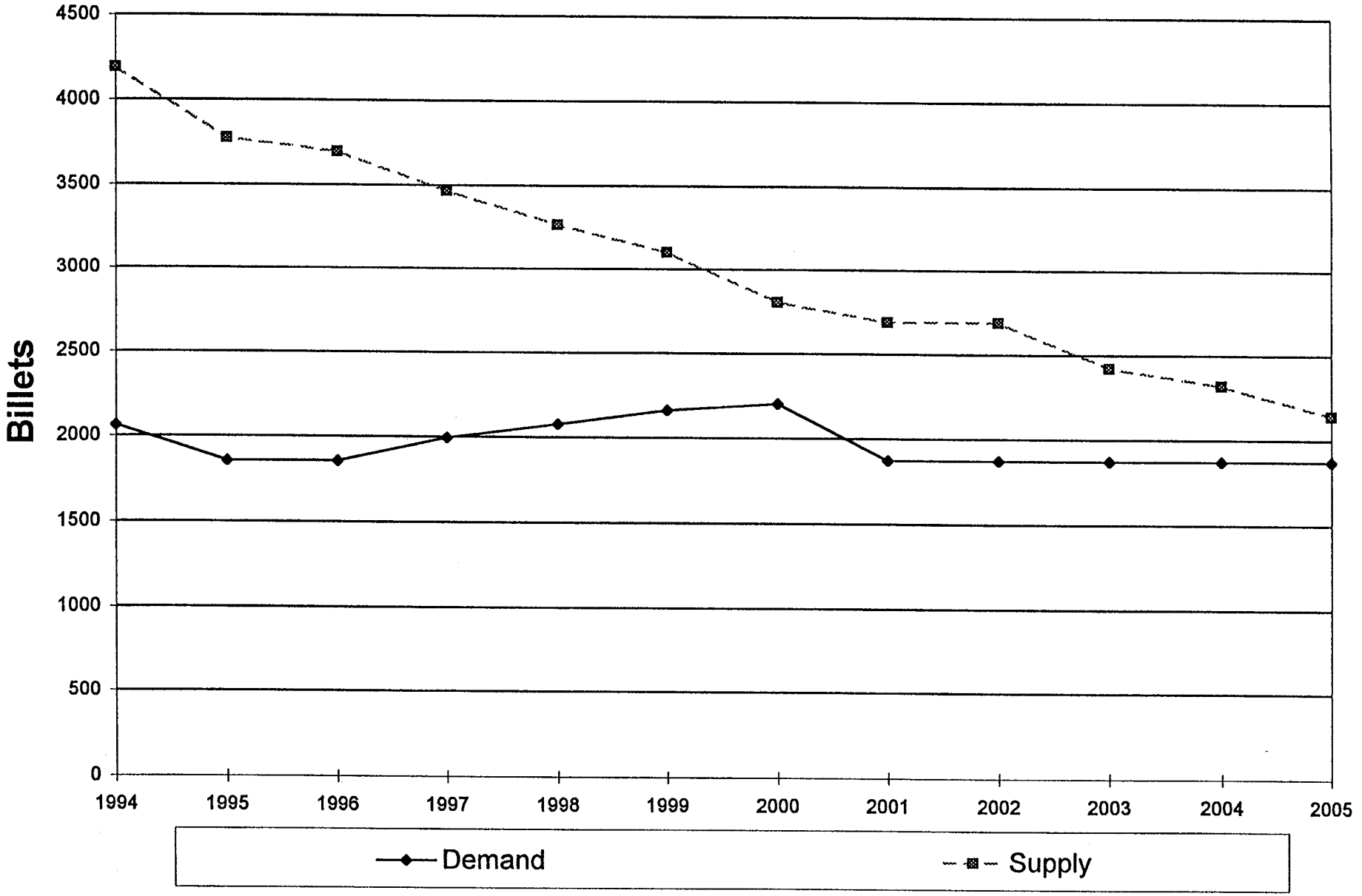
CASE 3
REDUCED CREW
GRAPH 14



SCENARIO II
SUBSIDY

SKILLED BILLETS
SUPPLY/DEMAND ANALYSIS

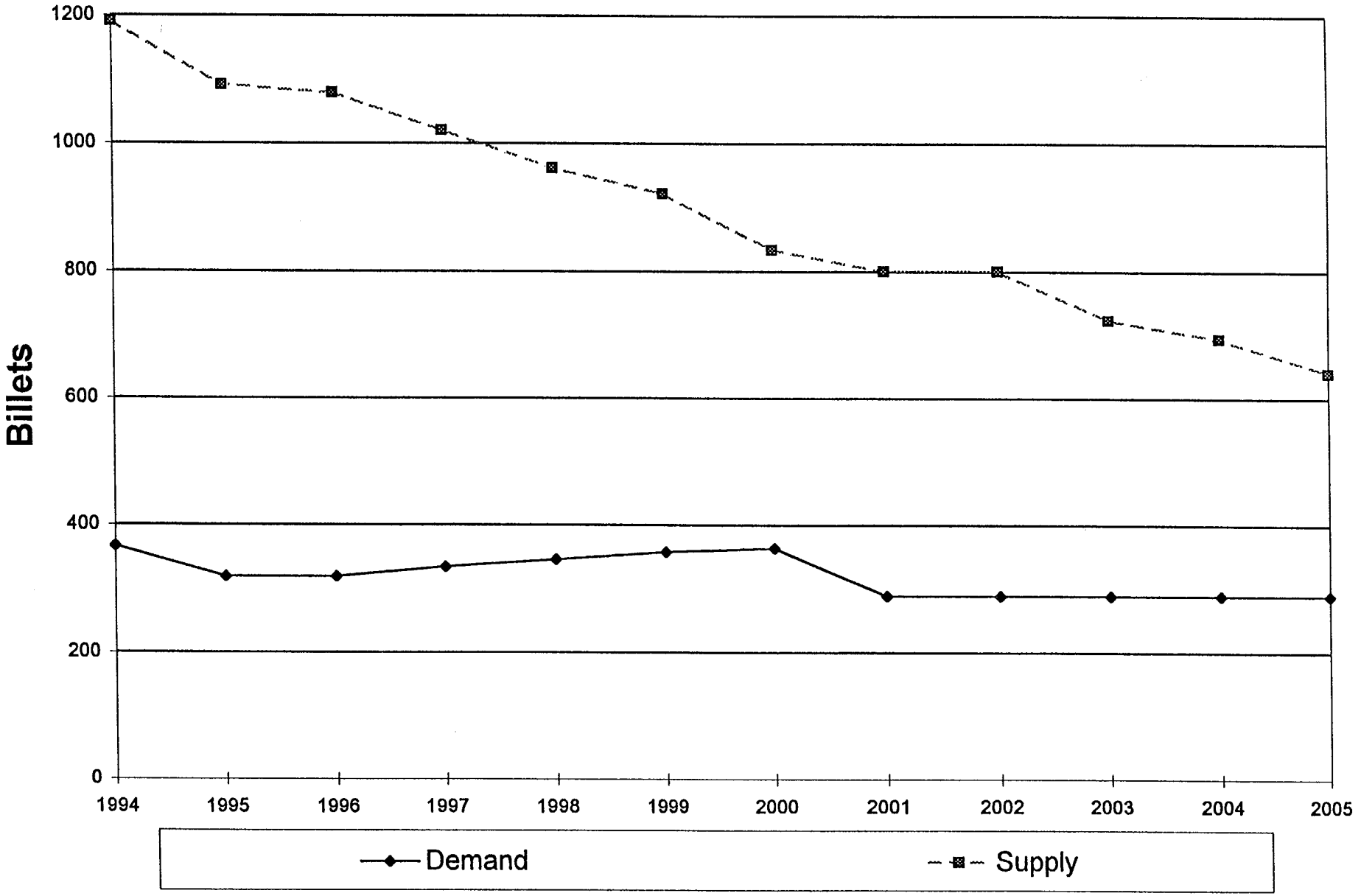
CASE 3
REDUCED CREW
GRAPH 15



SCENARIO II
SUBSIDY

DECK OFFICER
SUPPLY/DEMAND ANALYSIS

CASE 4
REDUCED CREW/ROS
GRAPH 16

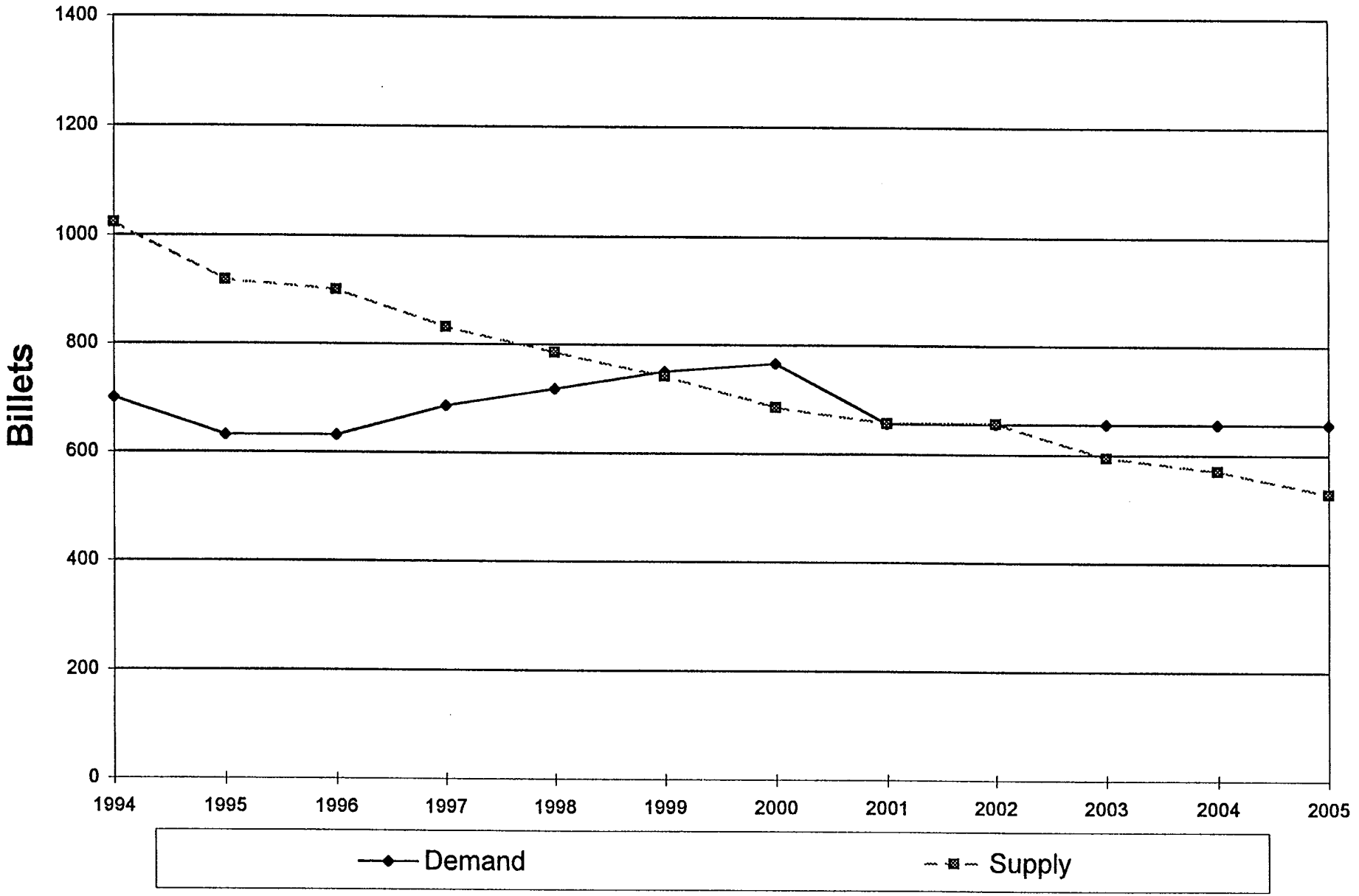


SCENARIO II
SUBSIDY

SKILLED UNLICENSED DECK

SUPPLY/DEMAND ANALYSIS

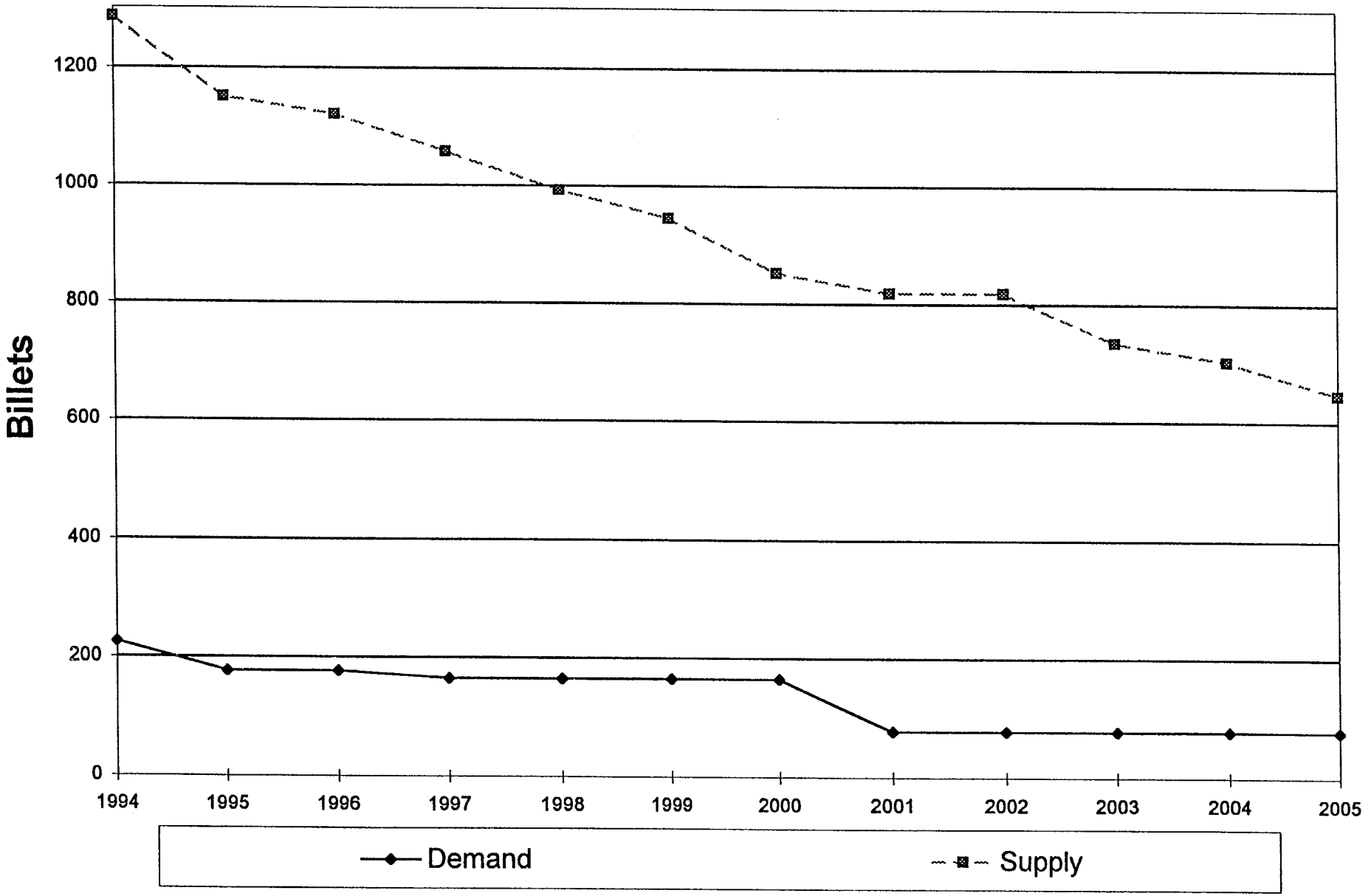
CASE 4
REDUCED CREW/ROS
GRAPH 17



SCENARIO II
SUBSIDY

ENGINEERING OFFICER
SUPPLY/DEMAND ANALYSIS

CASE 4
REDUCED CREW/ROS
GRAPH 18

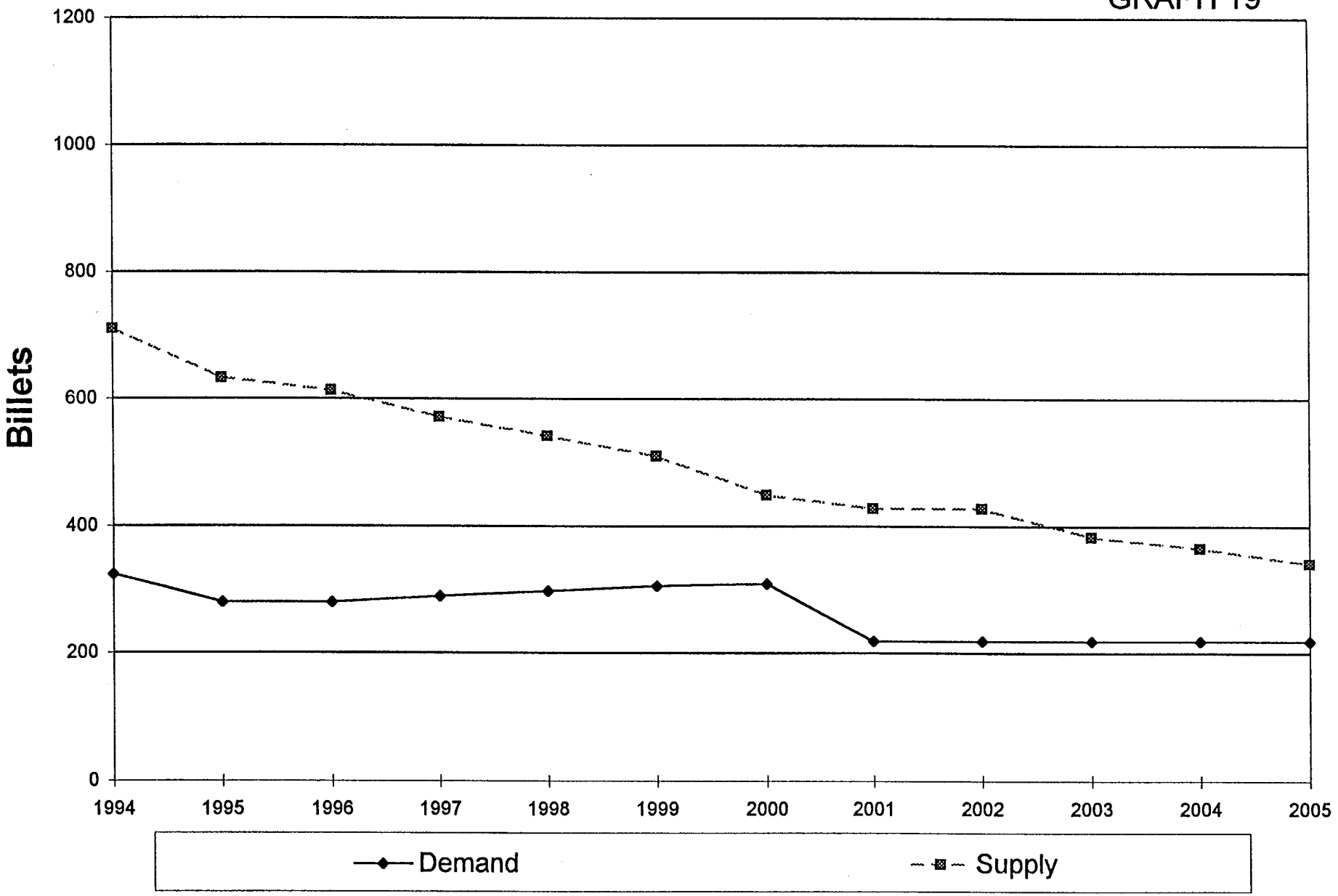


SCENARIO II
SUBSIDY

SKILLED UNLICENSED ENGINEERING

SUPPLY/DEMAND ANALYSIS

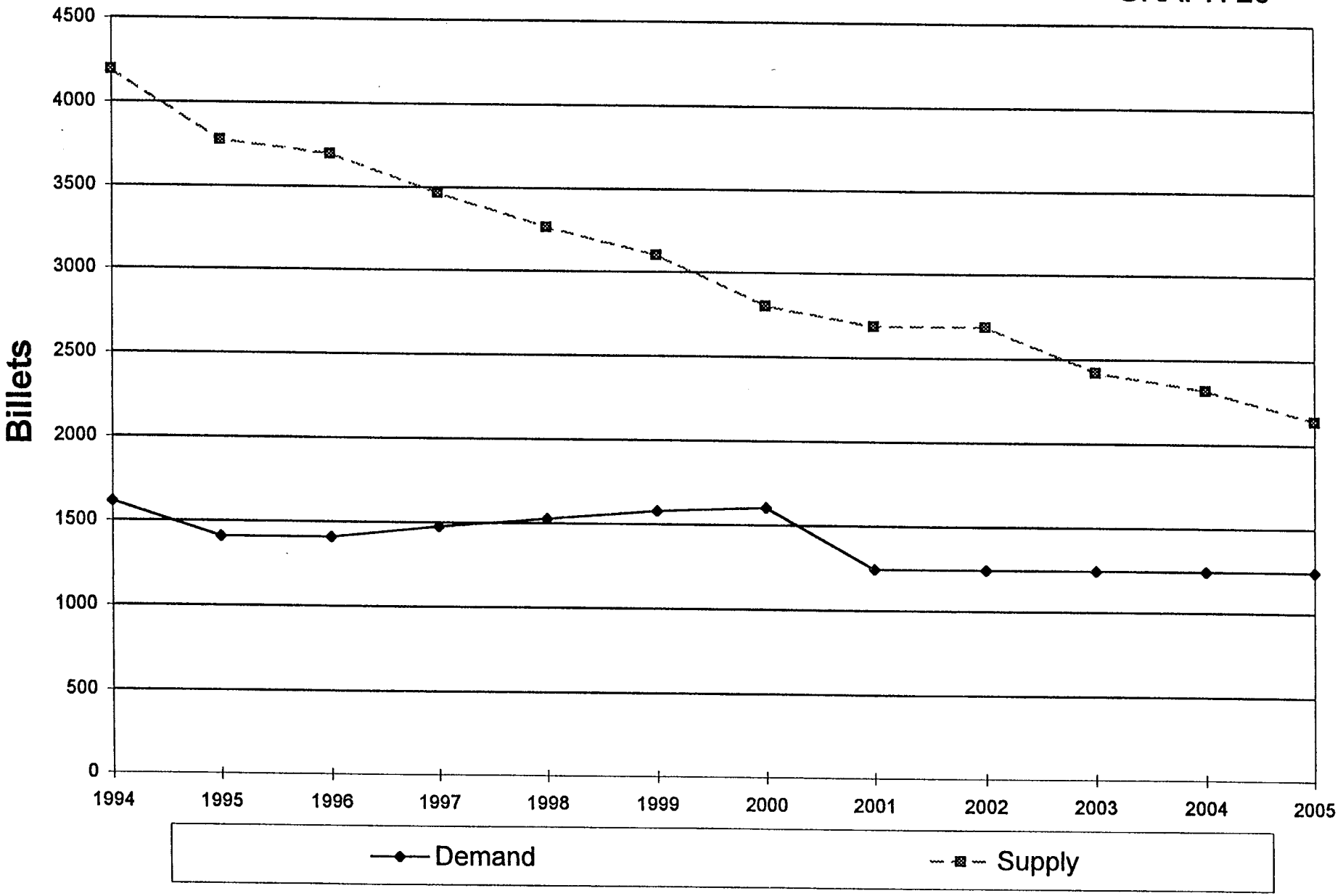
CASE 4
REDUCED CREW/ROS
GRAPH 19



SCENARIO II
SUBSIDY

SKILLED BILLETS
SUPPLY/DEMAND ANALYSIS

CASE 4
REDUCED CREW/ROS
GRAPH 20



Appendix H

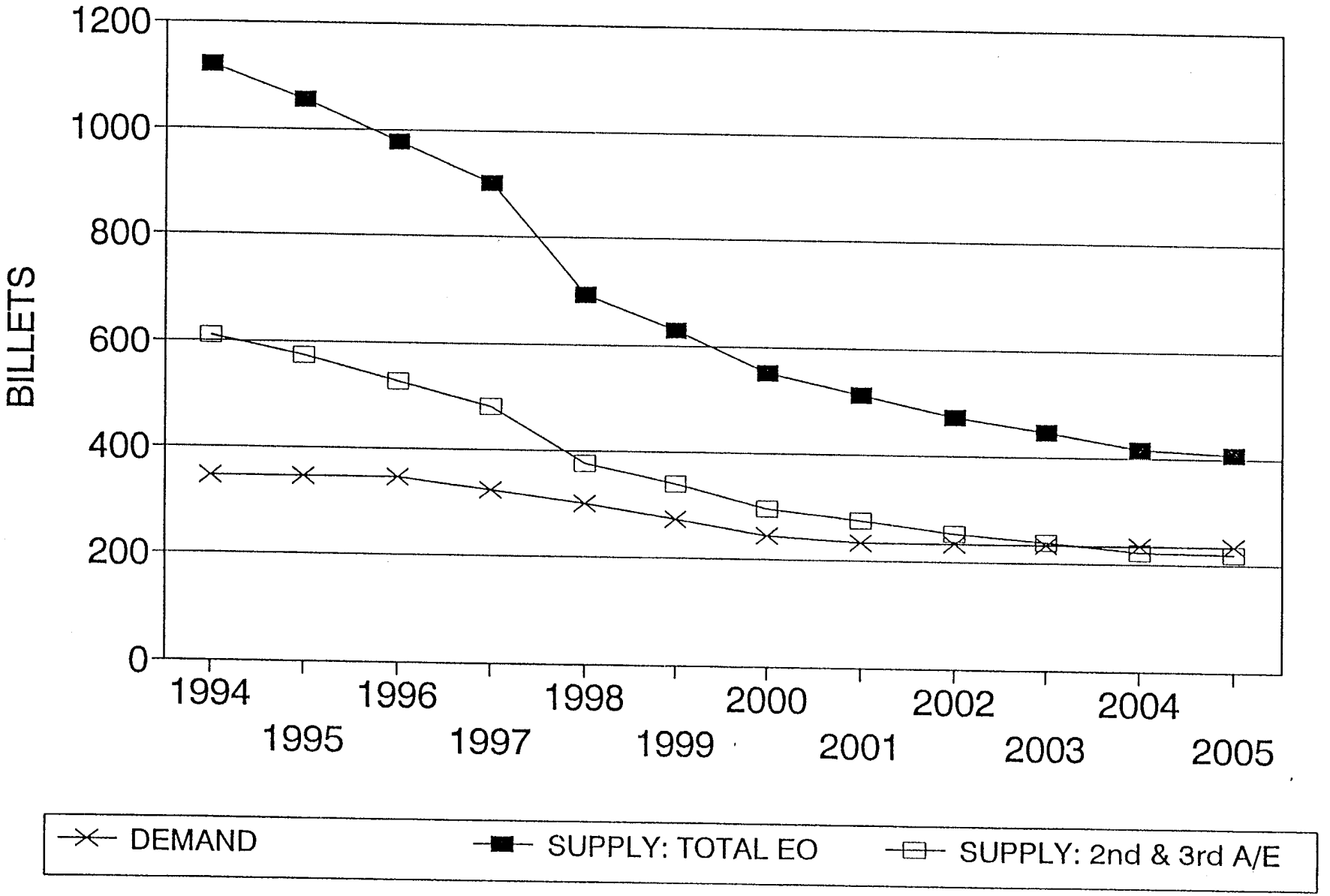
GRAPHS FOR SENSITIVITY ANALYSES

Re-Employment Rights
Sensitivity Analysis

FULL CREW/ROS

Engineering Officer

No Subsidy
Case 2

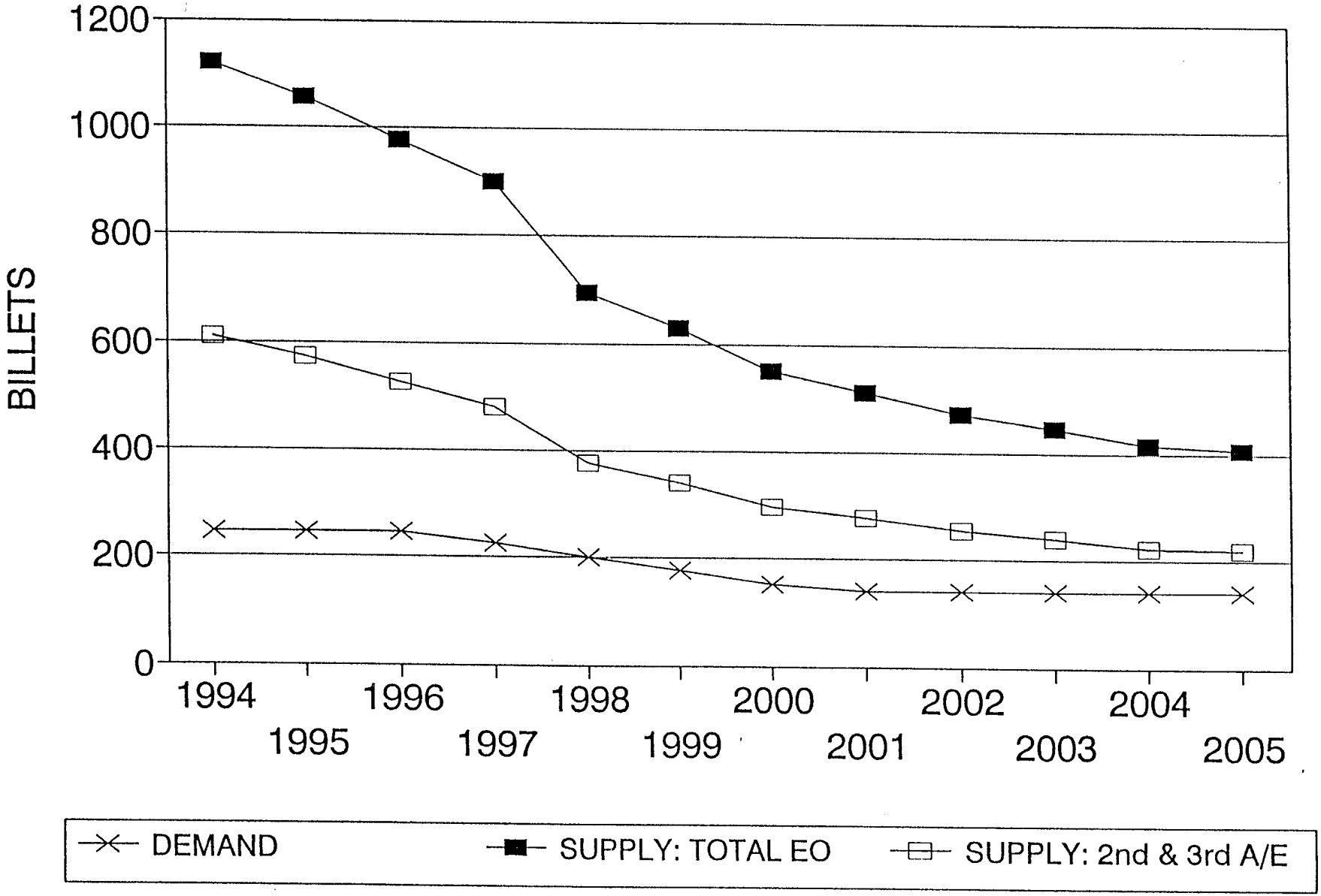


Re-Employment Rights - Sensitivity Analysis

REDUCED CREW/ROS

Engineering Officer

No Subsidy Case 4

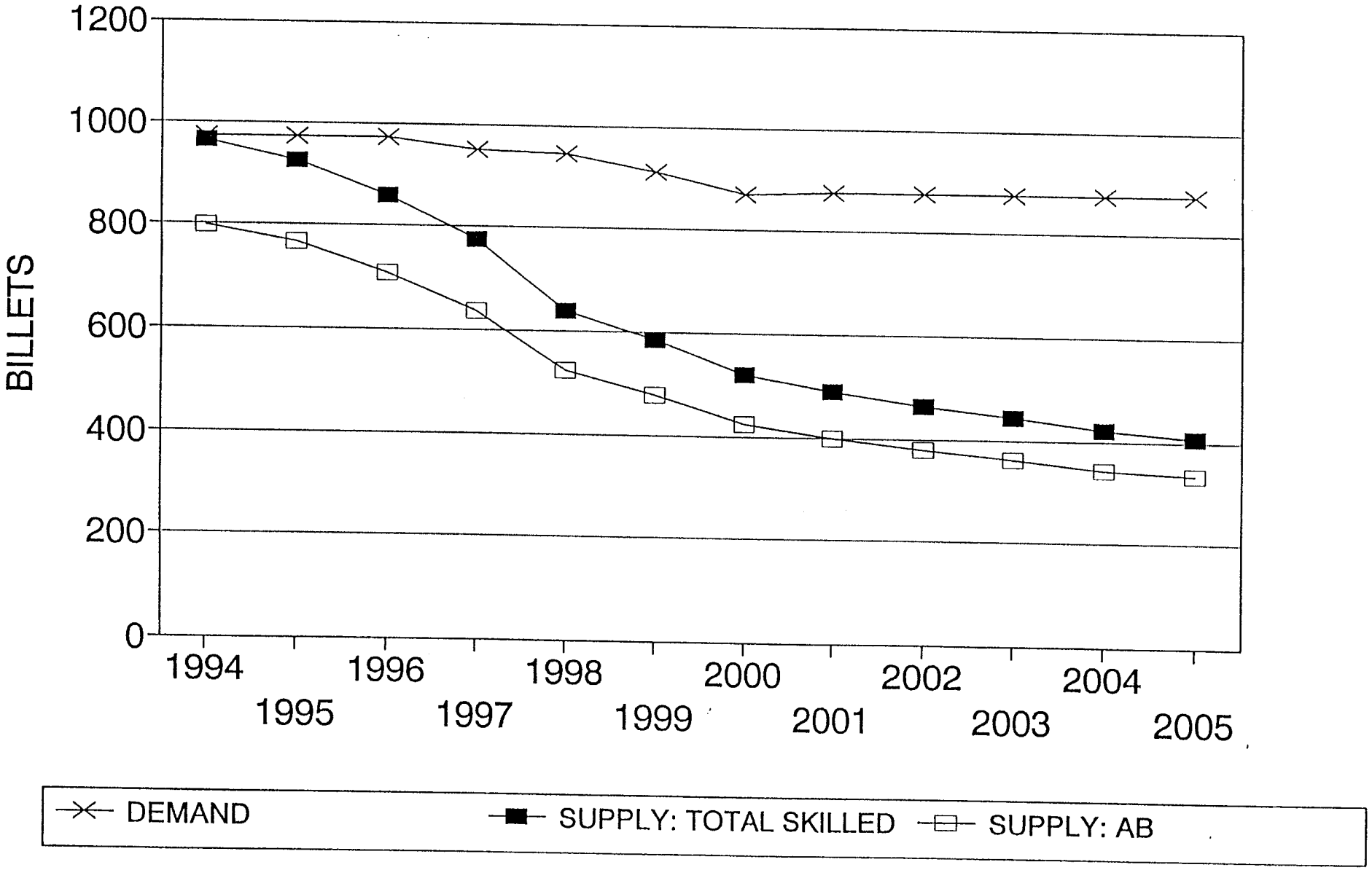


Re-Employment Rights
Sensitivity Analysis

FULL CREW/ROS

AB

No Subsidy
Case 2

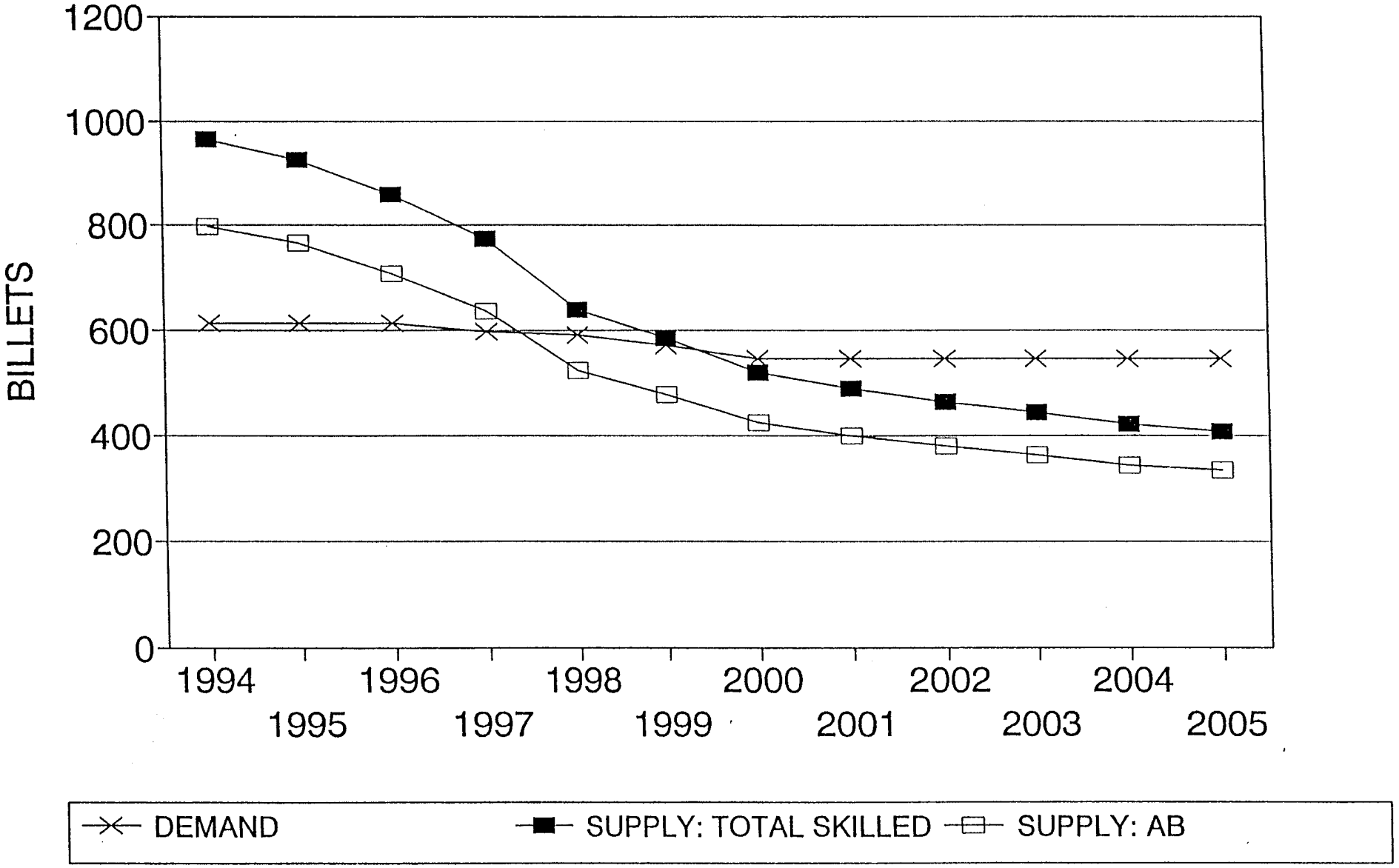


Re-Employment Rights - Sensitivity Analysis

REDUCED CREW/ROS

AB

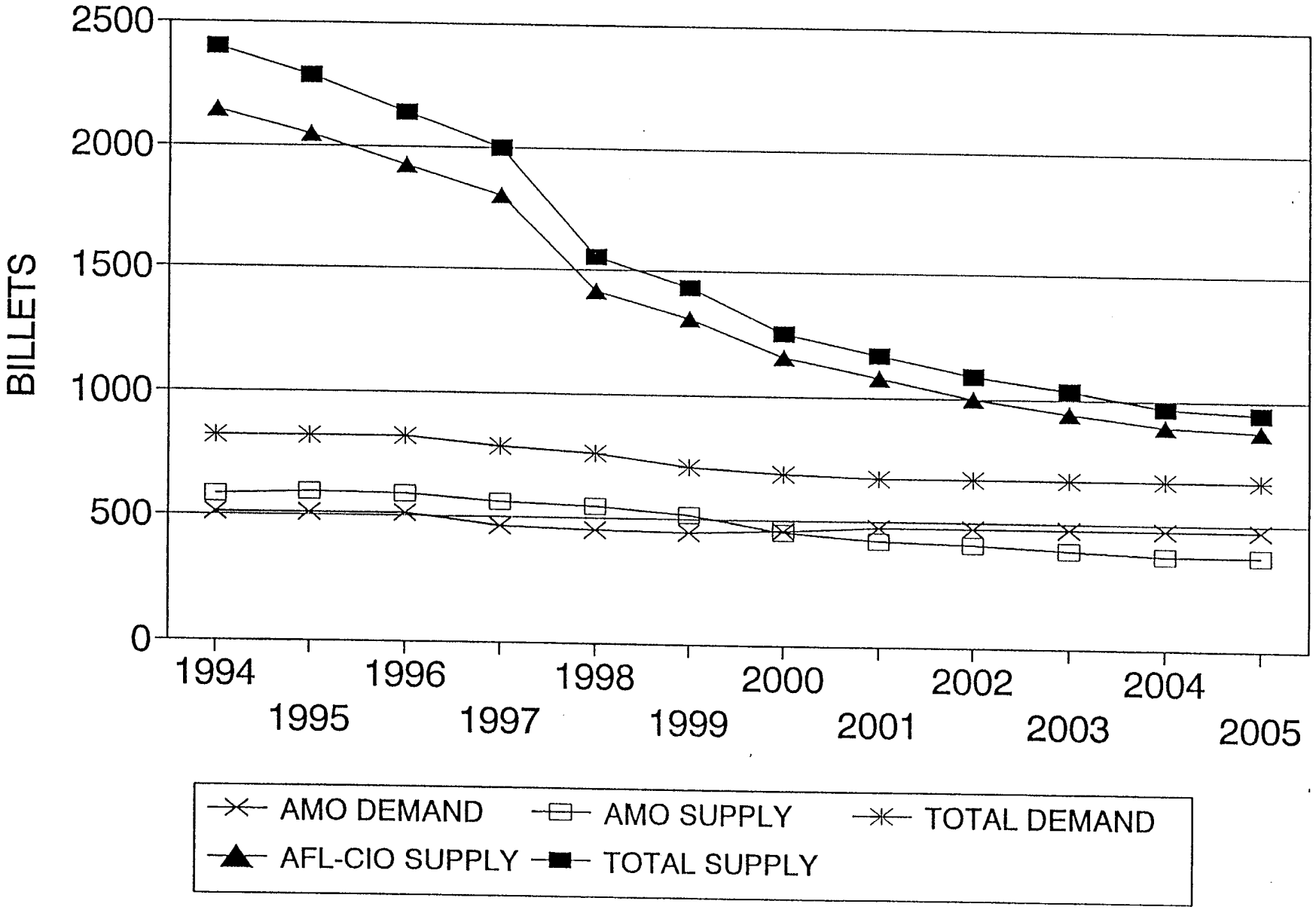
No Subsidy Case 4



Labor Utilization
Sensitivity Analysis

FULL CREW/ROS
LICENSED OFFICERS

No Subsidy
Case 2

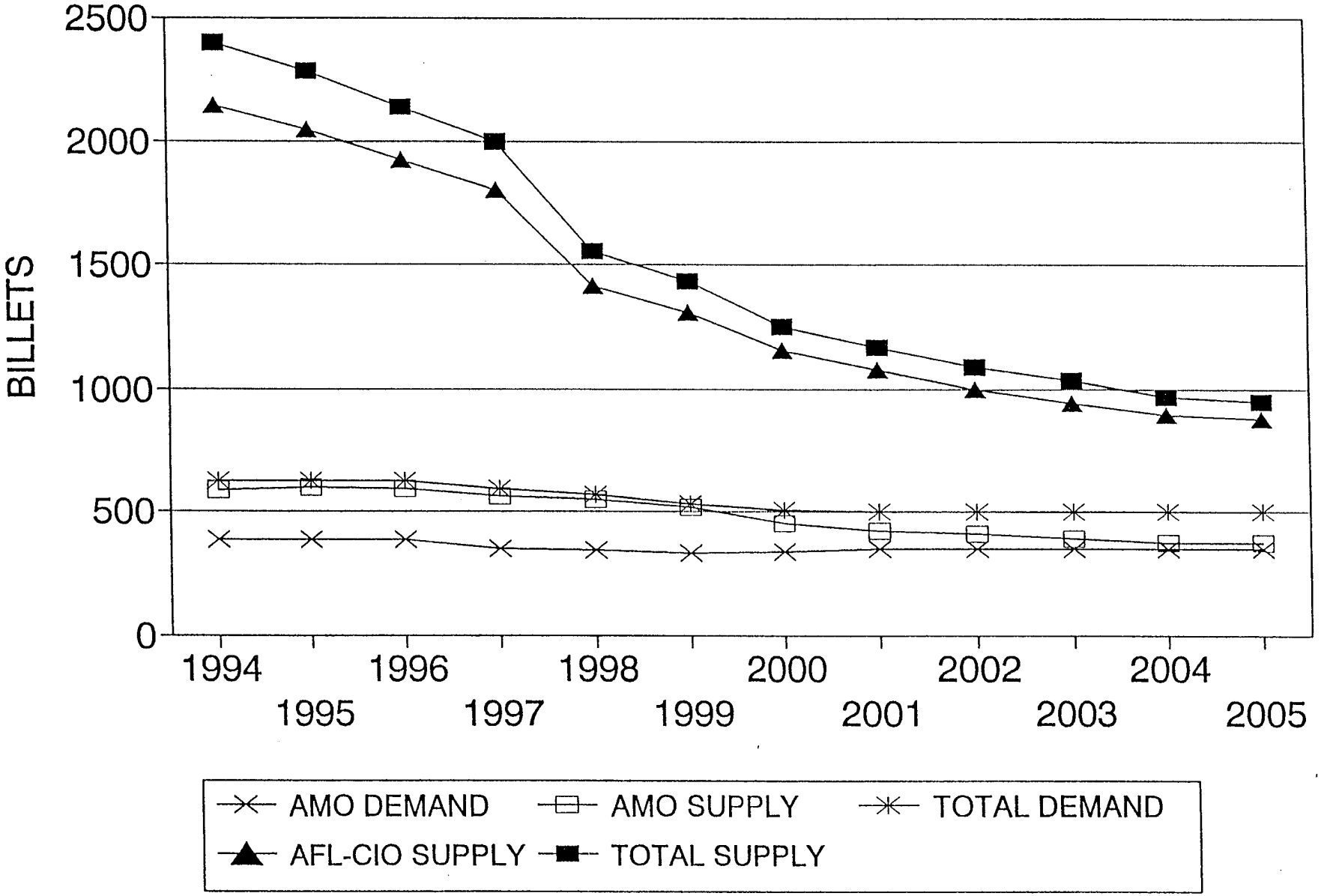


Labor Utilization
Sensitivity Analysis

REDUCED CREW/ROS

LICENSED OFFICERS

No Subsidy
Case 4

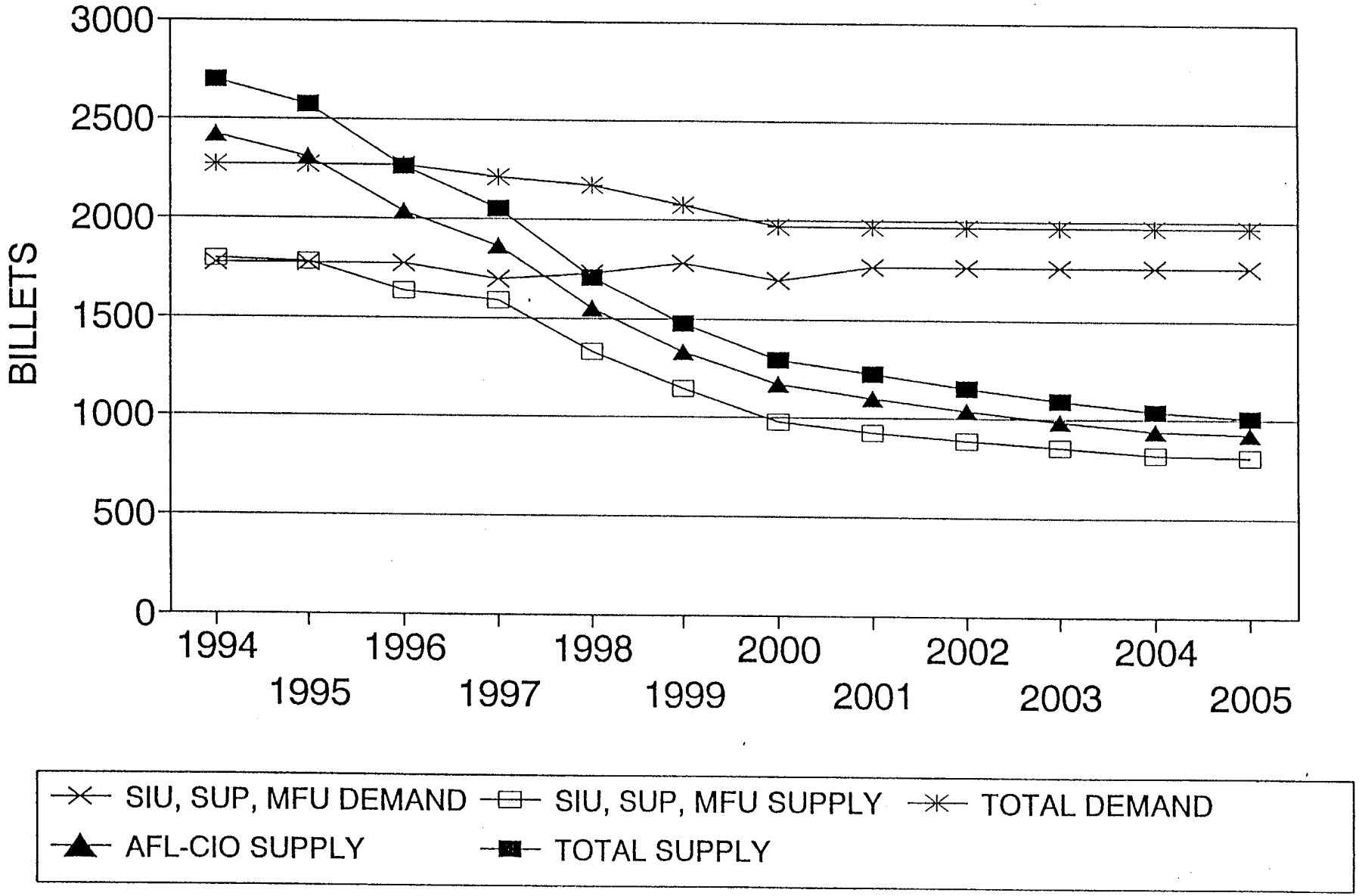


Labor Utilization
Sensitivity Analysis

FULL CREW/ROS

No Subsidy
Case 2

SKILLED UNLICENSED PERSONNEL

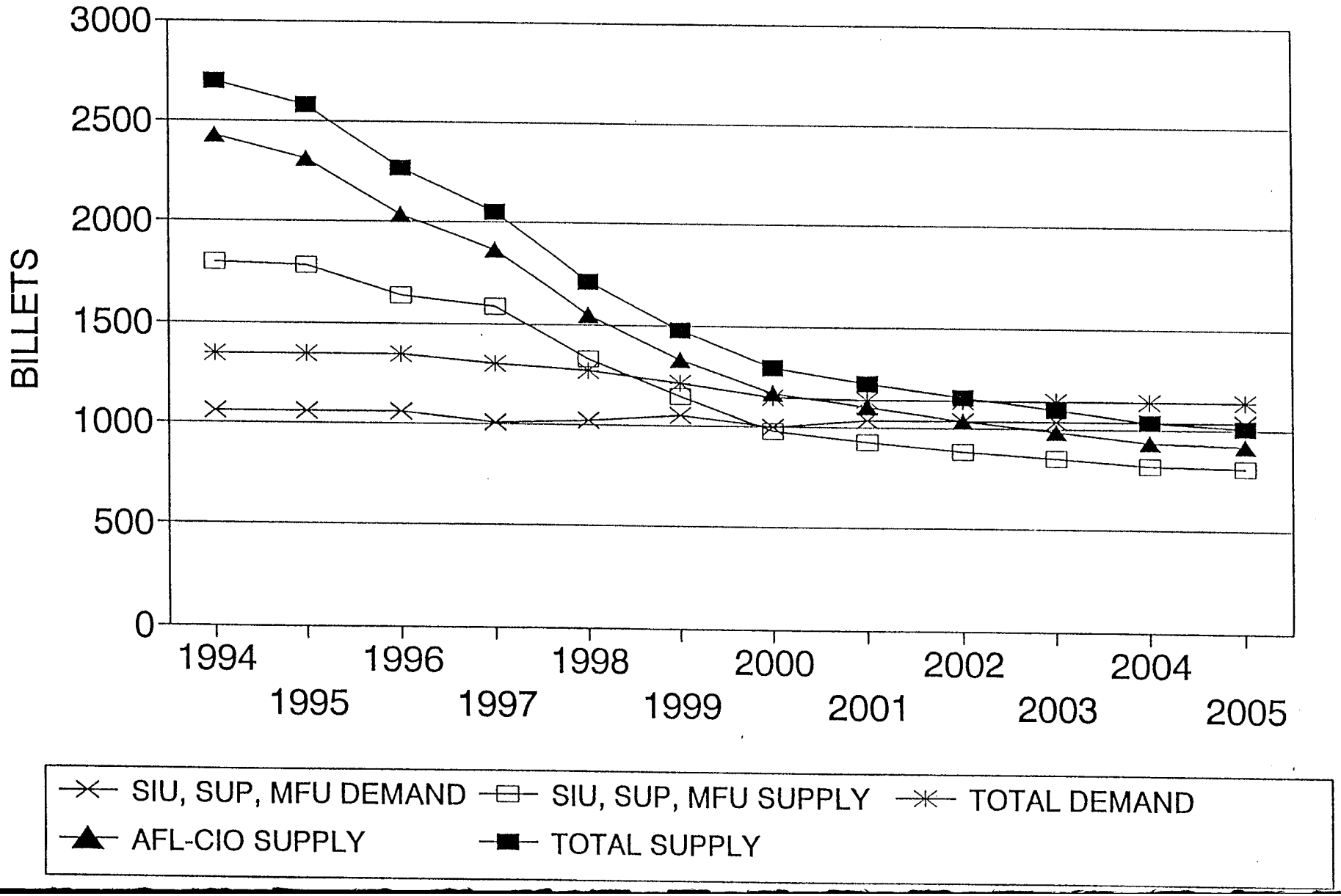


Labor Utilization
Sensitivity Analysis

REDUCED CREW/ROS

SKILLED UNLICENSED PERSONNEL

No Subsidy
Case 4



Appendix I

"CREWING THE READY RESERVE FORCE"
BRIEFING FOR VADM LOFTUS, N-4

CREWING THE READY RESERVE FORCE

BRIEFING FOR VADM LOFTUS, N-4

PRESENTED BY CAPT F. FLYNTZ
NR MMROCH 0206
MARCH 1993

THE CHALLENGE:
EFFECTIVELY CREWING THE RRF

- U.S. COMMERCIAL FLEET CONTINUES TO DECLINE
- SIZE OF RRF CONTINUES TO INCREASE
- CURRENT PLANS RELY SOLELY ON COMMERCIAL CREWING
- BASE OF AVAILABLE MARINERS MAY BE TOO SMALL

ODS
CREWING THE RRF IN 1990

10,000 BILLETS IN U.S. FLAG COMMERCIAL FLEET

20,000 MARINERS ACTIVELY SAILING (2:1 RATIO) IN FLEET

ASSUMPTION HAD BEEN THAT DURING A NAT'L EMERGENCY, ONLY 15,000 WOULD BE REQUIRED (1.5:1)

5,000 MARINERS AVAILABLE FOR RRF CREWING

FOR ODS:

24,000 MARINERS WERE ACTIVE

4,000 WERE NEEDED FOR RRF (78 SHIPS ACTIVATED)

ACCORDING TO PREDICTIONS:

9,000 MARINERS AVAILABLE FOR RRF

IN REALITY:

4,000 WERE FOUND -- EXHAUSTING EVERY POSSIBILITY

WHAT WENT WRONG?
ODS VS. PLANNING

- PLANNING BASED ON PAST MOBILIZATIONS
  - WWII
  - KOREA
  - VIETNAM
- RRF CONCEPT NOT TESTED UNTIL ODS
- DIFFERENCES
  - LARGER/STRONGER MERCHANT MARINE INDUSTRIES
  - COMMERCIAL FLEET COULD COPE WITH SURGE SHIPPING
  - LARGE STEAMSHIP COMPANIES TO ACT AS GENERAL AGENTS
  - RELATIVELY LONG RAMP-UP TIMES
- PERSONNEL DISTRIBUTION SYSTEM
  - WORKS WELL IN NORMAL PEACETIME OPERATIONS
  - NOT ADEPT AT RAPIDLY MATCHING SKILLS WITH REQUIREMENTS
  - LIKE ATTEMPTING TO MANAGE NAVY WITHOUT BUPERS

IS THERE A RELATIONSHIP BETWEEN
THE CIVILIAN MANNING POOL
AND
THE SIZE OF THE RRF
THAT CAN BE CREWED BY EXISTING MEANS?

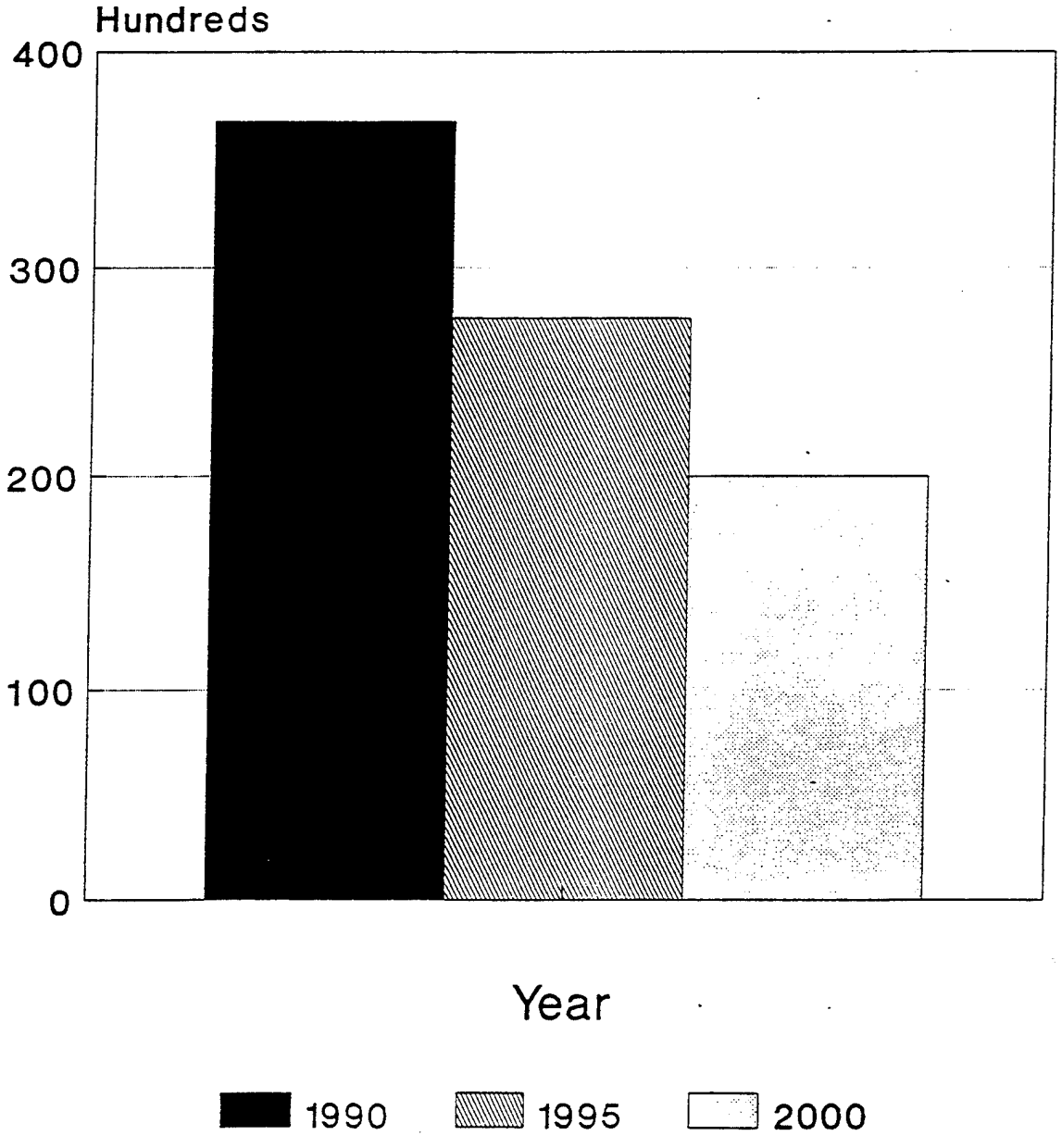
RELATIONSHIP
CIVILIAN MANPOWER POOL/RRF REQUIREMENTS

- YES, RELATIONSHIP EXISTS
- BUT...AVAILABILITY IS LESS THAN PREDICTED, MUCH LESS SHORT-TERM
- DURING ODS INITIAL SURGE:
  - 44 RRF SHIPS ACTIVATED
  - REQUIRED 2,000 MARINERS
  - EXHAUSTED READILY AVAILABLE SUPPLY (COMMERCIAL POOL)
- TOTAL ODS ACTIVATION:
  - 78 RRF SHIPS ACTIVATED (APPROX. 80% OF FLEET)
  - REQUIRED 2,000 ADDITIONAL MARINERS
  - EXTRAORDINARY MEASURES REQUIRED (ENHANCED COMMERCIAL POOL)

ENHANCED COMMERCIAL CREWING EFFORTS TO CREW 34 ADDITIONAL RRF SHIPS

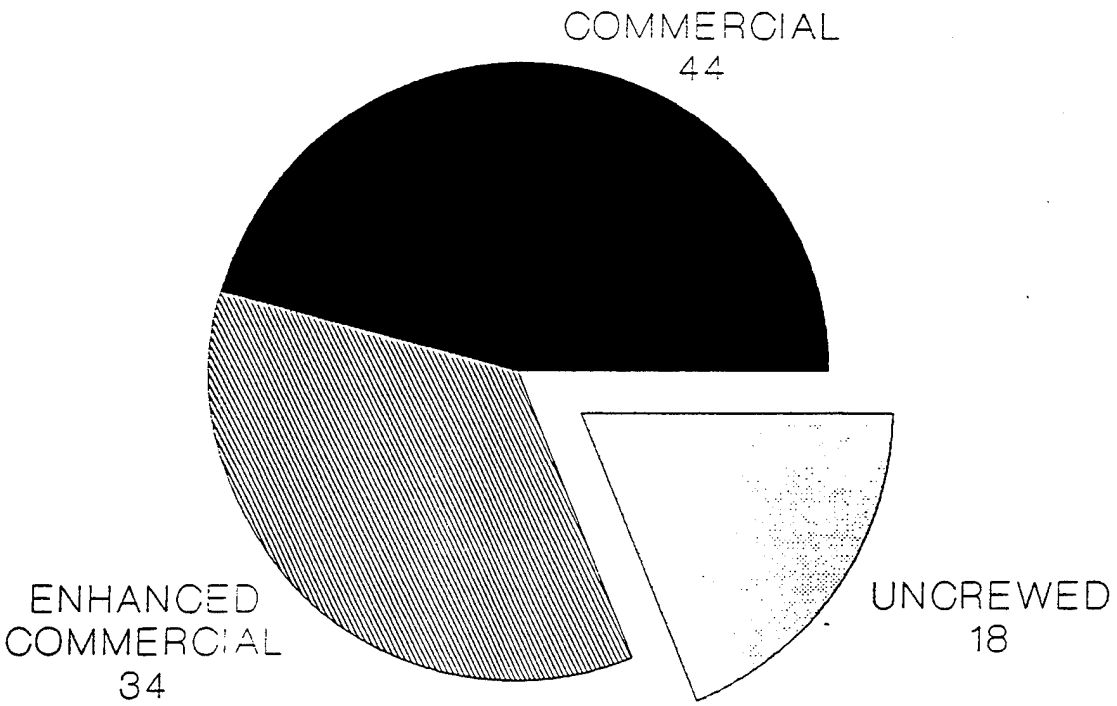
- RECALLED RETIREES
- RECALLED INACTIVE MARINERS HOLDING LICENSES
- WORKED CLOSELY WITH UNIONS, STEAMSHIP COMPANIES, ACADEMY ALUMNI ASSOCIATIONS
- WORKED WITH USCG TO RELAX REQUIREMENTS
- *CAN BE PRE-PLANNED TO AUGMENT NORMAL COMMERCIAL CREWING AVAILABILITIES*

FLEET SIZE
PREDICTED TRENDS



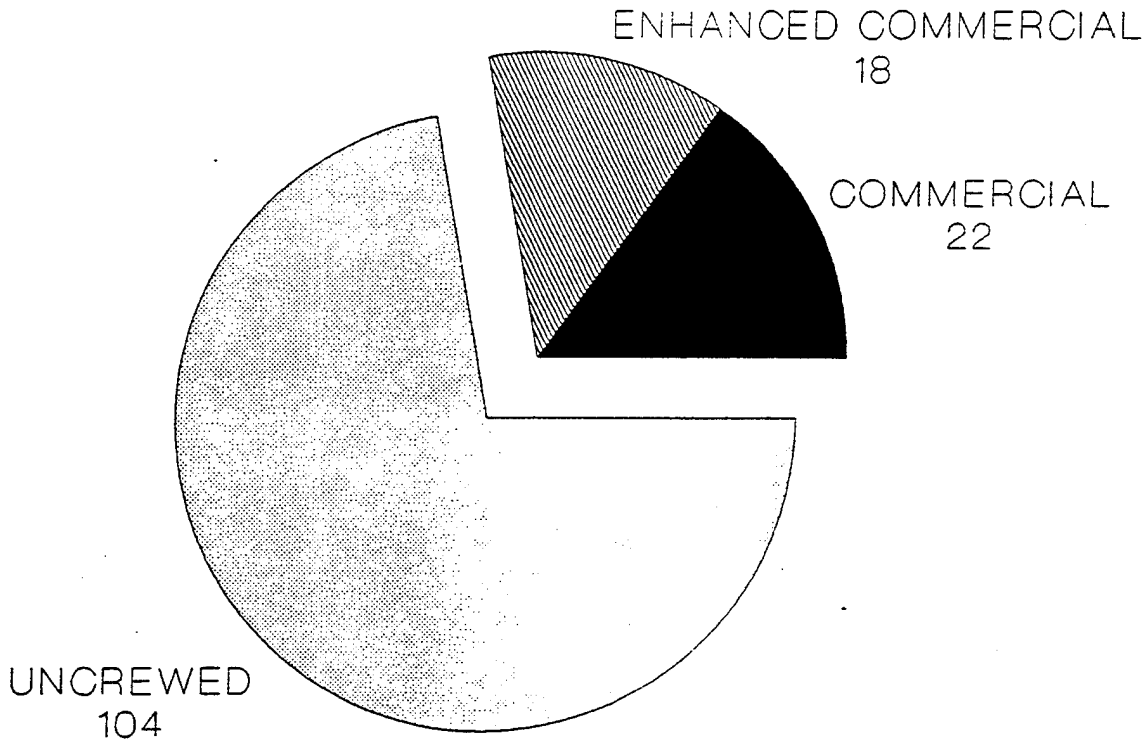
SMALLER FLEET • LIMITED RRF CREWING

RRF CREWING 1990
96 RRF SHIPS/380 COMMERCIAL



TOTAL COMMERCIAL CREWING DOUBTFUL

RRF CREWING 2000
144 RRF SHIPS/200 COMMERCIAL



SMALL FLEET = LTD COMMERCIAL CREWING

ADDITIONAL RESOURCES

WHAT ADDITIONAL RESOURCES EXIST?

BY 2000, SOME FORM OF
SUPPLEMENTAL CREWING
WILL BE REQUIRED

THE SOLUTION: HYBRID RESERVE CREWING MILITARY SERVICE/COMMERCIAL SKILLS

- OFFICER AND ENLISTED
- SUBJECT TO INVOLUNTARY RECALL
- POSSESS MERCHANT MARINE SKILLS
- FILL MERCHANT MARINE BILLETS
- REQUIRES SHIPS TO BE PUBLIC VESSELS

EXISTING RESOURCES IN NAVRES

USNR REQUIREMENTS

- ONLY CREW THAT PORTION OF RRF WHICH CAN'T BE CREWED COMMERCIALLY
- START WITH THE MOST DIFFICULT VESSELS
  - STEAMSHIPS
  - BREAKBULK
  - OLDEST
- APPROXIMATE CREWING REQUIREMENTS PER VESSEL:
  - 5 DECK OFFICERS
  - 5 ENGINEERING OFFICERS
  - 10 UNLICENSED DECK
  - 10 UNLICENSED ENGINE
  - 6 STEWARDS

ADVANTAGES OF USNR CREWING

- MUST BE PUBLIC VESSEL, THEREFORE NOT CONSTRAINED BY EXACT LICENSE/COI MATCH
- WOULD TRAIN THE WAY WE FIGHT
  - FORM INTO CREWS
  - BE ASSIGNED TO SPECIFIC SHIPS
- CAN INVOLUNTARILY CALL UP RESERVISTS; ALREADY COVERED BY SOLDIERS & SAILORS RELIEF ACT, ETC.
- CAN "GROW OUR OWN" EXPERTISE, I.E. NOT LIMITED BY SEATIME REQUIREMENTS
- APPROX. USNR CREW COST $214K/YR

RESERVE OFFICERS FOR RRF
MMIRRGS ARE AN EXISTING RESOURCE

- USE PORTION OF MMR, USNR NOT PRESENTLY SAILING:
  - STILL COMMISSIONED AS USNR
  - STILL HAVE VALID LICENSES
  - HIGH LEVEL OF SKILL RETENTION
  - WORKING ASHORE

- APPROXIMATELY 50% FALL INTO THIS CATEGORY
  - 1,500 OFFICERS
  - ALL LICENSE LEVELS INCLUDED (MOSTLY LOWER LEVEL)

- NO ENLISTED

THERE ARE OVER 3000 MMIRRG OFFICERS

ENLISTED FOR RRF

EXISTING RESOURCE IS SURFACE RESERVE

USNR UNLICENSED/ENLISTED EQUIVALENCIES:

- QMED: BT 3/2
  EN 3/2

- AB: QM 3/2
  BM 3/2

- STEWARD: MM/SN

APPROXIMATELY 26 PER SHIP ARE NEEDED

IMPLEMENTATION

- TASK MMROCH 0206 TO COMPLETE CREWING PLAN
  - CREWING FOR ONE SHIP (TBD)
  - TRAINING PLAN, NAVY AND COMMERCIAL RESOURCES (FIRST 6 MONTHS)
- ASSEMBLE CREW AS SELRES AND EXERCISE TRAINING PLAN (FIRST 6 MONTHS)
- ASSIGN SHIP AND EXERCISE ON SHIP (SECOND 6 MONTHS)
- UNDERWAY ON AT (AT END OF FIRST YEAR)

THIS WILL PROVE THE CONCEPT

POTENTIAL OPPOSITION
STRATEGY TO SEEK CONSENSUS

- STRESS THAT COMMERCIAL CREWING IS PREFERED
- WORK WITH LABOR TO DEVELOP ENHANCED COMMERCIAL CREWING
- RETURN SHIPS TO COMMERCIAL CREWING WHENEVER POSSIBLE
- AFFIRM THAT USNR WILL CREW COMMERCIALLY LEAST DESIRABLE VESSELS
- COMMIT TO USING COMMERCIAL SCHOOLS TO TRAIN USNR RRF CREWS. (CONTRACT WITH UNIONS TO DEVELOP SIMULATOR COURSES FOR BRIDGE TEAM TRAINING; USE CAT FUNDING)
- COMMIT TO RETURN SHIPS TO COMMERCIAL MANNING ANYTIME AFTER THE FIRST POST-ACTIVATION VOYAGE IF COMMERCIAL CREWS BECOMES AVAILABLE
- *TAKE ACTION NOW -- DON'T WASTE MORE TIME AND MONEY ON FURTHER STUDIES*

Appendix J

MEMORANDUM OF AGREEMENT BETWEEN DEPARTMENT of DEFENSE and DEPARTMENT of TRANSPORTATION

30 OCT 1988

MEMORANDUM OF AGREEMENT

BETWEEN

DEPARTMENT OF DEFENSE AND DEPARTMENT OF TRANSPORTATION

1. GENERAL

The Commander, Military Sealift Command (COMSC), on behalf of the Department of Defense, and the Maritime Administrator (Administrator), Maritime Administration (MARAD), on behalf of the Department of Transportation, agree that they have a mutual interest in the administration of the Ready Reserve Force (RRF).

2. PURPOSE

To provide for a working agreement between the Department of Defense and the Department of Transportation on the acquisition, lay-up and maintenance of ships in the RRF, on the conditions under which any or all ships of the RRF will be activated for operation under Navy operational control, on the conditions and procedures for subsequent deactivation and on other aspects of the foregoing activities consistent with the consolidation of program and funding responsibility for the RRF in MARAD, as reflected in the President's budget for FY 1989 and the budget passback guidance of the Office of Management and Budget dated March 4, 1988.

3. COMPOSITION OF THE RRF

a. The RRF will be composed of a mix of ships defined by COMSC. These ships shall be: upgraded to RRF status from the NDRF and acquired from private owners for the RRF with funds appropriated for that purpose. The time-phased build-up of the RRF, the total number of ships in the RRF, the mix, specific ship types that should be acquired, specific ship features, necessary modifications to ships, the area of positioning (including outporting), and timing of future changes in RRF composition will be defined by COMSC in accordance with requirement validations and budget limitations, and subject to the availability of ships as determined by the Administrator.

b. MARAD also will effect installation of all unique features and modifications upon RRF ships required for potential use in direct fleet support operations, upon identification of such work and transfer of funding by Navy.

4. RRF SHIP ACQUISITION

a. Based on guidance provided by COMSC with respect to the desirability of specific types and numbers of vessels essential to support mission requirements, MARAD will identify and maintain a listing of current and projected vessels available to support the indicated requirements.

b. COMSC will provide MARAD specific guidance with regard to the numbers and types of ship to be acquired, including desired features and the priority of each.

(1) The above guidance will provide the basis for MARAD's development of the Source Selection Plan (Plan). MARAD shall seek concurrence for the Plan from COMSC prior to receiving approval of the Plan from the Source Selection Official (SSO). Upon approval by the SSO, the Plan will provide the basic guidance to the Source Evaluation Board (SEB) in preparing the solicitation and conducting the acquisition.

(2) The SEB will be chaired by MARAD, with participation by MARAD, the Office of the Secretary of Transportation and the Navy (i.e., COMSC or his designee), as well as any other special members the SSO agrees to as appropriate. The SEB will seek concurrence from COMSC prior to approval of the final source selection by the SSO.

c. MARAD will execute the acquisition of ships in accordance with Department of Transportation/MARAD acquisition authorities and procedures.

d. The Administrator will pursue all opportunities to obtain ships for the RRF by means of program authority conferred by statute, e.g., Section 510, Merchant Marine Act, 1936, as amended (46 App. U.S.C. 1160). Exercise of such authority in the context of the RRF shall include close consultation with COMSC and will take into account the availability of upgrade funds needed to place the ships into the RRF.

5. PREPARATION AND MAINTENANCE

a. Ships in the RRF will be maintained in accordance with standards agreed to by COMSC and MARAD. Preparation of ships for the RRF will be performed by MARAD in accordance with specifications mutually agreed to by COMSC and MARAD. These specifications will include, but not be limited to, the

requirement that each ship enter the RRF in a state of good repair and preservation, fully classed by the American Bureau of Shipping (ABS), possessing current United States Coast Guard (USCG) Certificate(s) of Inspection and fully documented by the USCG. Merchant type vessels being transferred to MARAD by Navy in expectation of RRF designation will be prepared by Navy in accordance with such specifications.

b. All ships of the RRF will be maintained by MARAD "In Class" as required by ABS and USCG, and in documentation by USCG. MARAD will maintain these ships in such a state that they can be activated and ready for sea within a specified time frame. These predetermined time frames, i.e., within 5, 10, or 20 days, will be provided by COMSC and assigned to each RRF ship. At any time the above criteria are not met, MARAD will so advise MSC and provide a time estimate for correction.

c. Supporting specifications for activation, deactivation and maintenance of ships in the RRF will be in accordance with procedures prepared and maintained by MARAD.

d. MARAD will be responsible for development and maintenance of a logistics support system designed to sustain the RRF ships in operating status for a period of 180 days.

e. Subject to the availability of funds with regard to "a." through "d." above, the ships will be outfitted and maintained on the basis of priorities agreed upon by the Points of Contact designated in Article 12 of this agreement.

6. MANNING AND OPERATION OF RRF SHIPS

a. RRF ships will be operated under contract between MARAD and individual companies. Existing agreements will be replaced, as soon as possible, with Ship Manager Contracts (SMC) entered into through competitive processes to the maximum extent practicable. At all times, such contracts will be "in being" and capable of being fully implemented immediately upon notification by COMSC that a determination for activation has been made.

b. On reactivation, RRF ships will remain under the contract to MARAD (Ship Managers) for the account of the Department of Defense. COMSC will exercise operational control of all ships placed into the active Department of Defense service.

7. ACTIVATION

a. Ships in the RRF shall be activated pursuant to Presidential action or as otherwise authorized under law.

b. COMSC is the appropriate office in the Department of Defense to determine what ships among those assigned to the RRF should be activated in defense emergencies and when they are needed. No ship or ships of the RRF shall be used to store or carry any non-defense related cargo without Department of Defense concurrence.

c. Ships in the RRF, at the request of COMSC without Presidential action --

(1) Will be activated for the purpose of testing for readiness and suitability for mission performance in accordance with Article 8 hereof,

(2) Will be activated in connection with a transfer in accordance with Article 13 hereof,

(3) May be activated (i) for support of the deployment of U.S. armed forces in a military contingency, or (ii) for military contingency operations, or (iii) for civil contingency operations upon orders from the National Command Authority as defined in JCS Pub. I.

Provided, that ships activated under this Article shall not be in competition with or substitute for or displace privately-owned U.S.-flag vessels.

8. TEST & INSPECTION

a. Annually, subject to the availability of funds, a planned activation of one or more ships (including operation for an extended period, normally not more than 60 days) will be conducted. The planned activation, utilization and period of use will be as mutually arranged between COMSC and MARAD.

b. Additionally, at COMSC direction, periodic no-notice RRF ship activation tests may be conducted. These no-notice tests will consist of full ship activation, at-sea steaming for a period to be determined by COMSC (but normally not more than 60 days), and an operational test of all cargo handling equipment. These tests may be conducted in connection with other planned extended operational test periods or, at COMSC discretion, as independent activation tests.

c. For all activations under "a." and "b." above, COMSC shall provide to MARAD the test plan, including the projected period of activation and a certification that substantially the same military exercise cargo will be carried outbound and inbound.

d. There shall be an annual Navy/MARAD review of the maintenance, readiness, repair, and operational tests of each RRF ship. This review shall be the basis for ensuring that lay-up, maintenance and test procedures are adequate to achieve the readiness objectives. Results of this review will be used to identify RRF ship improvement projects and to adjust the readiness status of individual ships for the subsequent year.

Reviews will be conducted so that project funding, including improvements and enhancements, can be included in the MARAD fiscal year budget submission and funding for unique features and modifications for direct fleet support operations can be included in the Navy fiscal year budget submission.

e. MARAD will report the readiness status of all RRF vessels by message monthly in a format agreed to by the Points of Contact designated in Article 12 of this agreement.

f. COMSC in conjunction with MARAD will observe RRF ship readiness to include maintenance, ship activation/deactivation procedures and associated activities at outport and National Defense Reserve Fleet Sites.

9. COMPETITIVE CONTRACTING

a. All shipyard and ship repair facility work to the RRF ships will be accomplished by MARAD, will be performed in the United States (except in emergencies) and will, to the maximum extent practicable, be effected through competitive procurement processes.

b. The award of SMC will be accomplished by MARAD and will, to the maximum extent practicable, be effected through competitive procurement processes.

c. The acquisition of ships for the RRF will be accomplished by MARAD and will, to the maximum extent practicable, be effected through competitive procurement processes. Ships excess to the needs of U.S.-flag operating companies and meeting defined RRF requirements will be given priority. Other ships will be considered if said priority ships are not available or not available in sufficient number to satisfy the requirement or to introduce meaningful competition, provided that they be documented under U.S. law when title transfers.

10. BUDGET ESTIMATES AND PROGRAM INFORMATION

a. MARAD will request the Navy to provide planning guidance annually to MARAD by May 15, for use in formulating funding requirements for the MARAD budget process for the fiscal year

beginning on October 1 of the following calendar year and the succeeding five fiscal years. These data will include a review of the current program and will include the following proposed planning assumptions:

RRF Ships

--- Revised RRF Ship Levels and Ship Mix
--- Ship Upgradings/Acquisitions/Deletions/Downgrading
--- Readiness Category for Each RRF Ship
--- Ship Positioning Requirements
--- Ship Activations by Number and Type of Activation, Type of Ship and Duration of Activation
--- Training Requirements

Direct Fleet Support Operations, Unique Features and Modifications and Other Anticipated Reimbursable Projects. (Based on broad guidance provided by Navy annually in May, MARAD will provide definitive cost estimates and assumptions in July for Navy use.)

b. Based on Navy planning assumptions, subsequent consultations with the Navy and other relevant considerations, MARAD will submit a proposed budget to the Office of the Secretary of Transportation (OST) in July and provide copies to the Navy. OST shall maintain close coordination with the Office of the Secretary of Defense (OSD) to ensure that OSD's views are given full consideration as OST reviews MARAD's budget request for the RRF. OST will submit the budget to OMB in September in accordance with OMB requirements.

c. MARAD will provide to the Navy information on congressional action on the FY 1989 and successive budget submissions as well as other revisions that may occur during execution of approved budgets. Along with such notification, MARAD will, in consultation with Navy, prepare revised plans reflecting Navy priorities with regard to major program categories.

d. In addition to all other information exchanges provided for in this agreement, the parties will conduct periodic RRF program reviews. The format, agenda and participants will be as mutually agreed to by the Points of Contact designated in Article 12 of this agreement.

11. FUNDING

a. Appropriations for the RRF program obtained by the Navy through FY 1988, including acquisitions, will be transferred to MARAD with appropriate guidance from the Navy on application thereof.

b. Beginning in FY 1989, MARAD will request appropriations for all phases of the RRF Program, with the exception of direct fleet support operations features and modifications.

c. Costs of ship activations and other activities for which funds are not appropriated to MARAD will be funded by the sponsoring defense agency and transferred to MARAD by COMSC or the sponsoring agency.

12. OPERATING PROCEDURES

a. The Director, Office of Ship Operations is the MARAD Point of Contact with cognizance over RRF matters.

b. The COMSC Readiness and Program Introduction Officer is the Navy Point of Contact with cognizance over RRF matters, except for activation orders which will issue from COMSC.

c. These designated officers will develop additional detailed working arrangements necessary to implement this agreement.

13. TEMPORARY TRANSFER OF RRF SHIP

a. From time-to-time, the Navy may have a need for sealift capacity which can only be satisfied by a ship in the RRF, which need is beyond the scope of Articles 6, 7 and 8 hereof. Such need shall be considered under the authority conferred by 40 U.S.C. 483a, and in accordance with the following.

b. Any ship transferred to the Navy under this Article 13 shall remain part of the RRF with an assigned readiness status consistent with its intended use.

c. Each request for a ship shall be submitted to the Administrator by COMSC, who shall include the following information:

(1) The type of ship.

(2) Certification that no commercial cargo will be carried.

(3) The proposed period of use and area of operation.

(4) The commitment that all costs associated with the request will be funded by the Navy from appropriations other than those available for the RRF.

d. When a ship with unique capabilities is needed to satisfy military requirements, the Administrator must agree if these requirements cannot be met by available privately-owned commercial U.S.-flag vessels.

e. The particular ship may be used by the Navy for the carriage of defense cargo as a secondary mission if such carriage does not interfere with the primary mission for which the ship was activated and conforms with c. above.

f. During the period of transfer, the assigned contractor shall remain responsible for the ship, including at-sea operations, under its contract with MARAD.

g. Upon conclusion of the period of transfer, the ship will return to its regularly assigned readiness status.

14. MODIFICATION

This agreement may be modified in whole or in part at any time by mutual agreement of the Administrator and COMSC. Either party may propose modifications whenever deemed necessary or desirable. The parties agree to consider such proposed modifications promptly.

15. EFFECTIVE DATE

This agreement is effective October 30, 1988, and supersedes the previous Memorandum of Agreement, dated October 26, 1982.

FOR THE DEPARTMENT OF TRANSPORTATION

FOR THE DEPARTMENT OF THE DEFENSE

DATE

Appendix K

OPINION OF THE NAVY DEPUTY ASSISTANT JUDGE ADVOCATE GENERAL on NAVAL RESERVE CREWING OF THE READY RESERVE FORCE

DEPARTMENT OF THE NAVY
OFFICE OF THE JUDGE ADVOCATE GENERAL
200 STOVALL STREET
ALEXANDRIA, VA 22332-2400

IN REPLY REFER TO
4625
Ser 1MA1105B.93
29 Nov 93

MEMORANDUM

From: Deputy Assistant Judge Advocate General (Admin Law)
To: Director, Strategic Sealift Division, Office of the Chief of Naval Operations (N-42)

Subj: NAVAL RESERVE CREWING OF THE READY RESERVE FORCE

Encl: (a) Discussion

1. This responds to your informal request for an opinion on whether members of the Naval Reserve may be assigned to Ready Reserve Force (RRF) ships during a reactivation if civilian-manpower sources are insufficient to crew the activated vessels. In our view, Reserve personnel may be so assigned once the ships are accepted by DOD.

2. As discussed in enclosure (1), SECNAV may assign Naval personnel to duties in furtherance of military missions under his cognizance. The authority and responsibility to man vessels in the National Defense Reserve Fleet, of which the RRF is a part, is, however, vested by Congress in the Department of Transportation and is carried out by the Maritime Administration (MARAD). Nonetheless, if RRF vessels were reactivated by MARAD and accepted by DOD, then Naval personnel could be assigned to specific ships as necessary to fulfill military requirements. Doing so would raise significant policy questions which should be resolved between DOD and DOT and memorialized in a memorandum of agreement or in specific statutory authority which currently does not exist.

P. W. Kelley
P.W. KELLEY
CAPT, JAGC, USN

FOR OFFICIAL USE ONLY

DISCUSSION

Subj: NAVAL RESERVE CREWING OF THE READY RESERVE FORCE

1. Issue. May members of the Naval Reserve be assigned to Ready Reserve Force (RRF) ships during a reactivation if civilian-manpower sources are insufficient to crew the activated vessels?

2. Background

a. Factual Context: During Operations Desert Shield and Storm, vessels from the RRF were reactivated and manned by civilian merchant mariners working under contract with the Maritime Administration (MARAD). In some cases, individual crew members were in their sixties, making their availability for future deployments rather questionable. The decline of the U.S. Flag Fleet and the corresponding reduction in the number of U.S. Merchant Marine personnel, as well as the growing obsolescence of the National Defense Reserve Fleet (NDRF), causes concern that civilian sources of manpower to crew the RRF during a large scale reactivation will be inadequate, and that the available personnel may not be trained or qualified to operate the equipment on RRF vessels. Director, Strategic Sealift Division (N-42) asked for a legal review of issues that might arise if a contingency plan were developed to man RRF vessels with members of the Merchant Marine Reserve, U.S. Naval Reserve, or Regular Navy members.

b. The Statutory Basis. The NDRF was created from war surplus vessels owned by the U.S. Government by Section 11 of the Merchant Ship Sales Act of 1946.[1] That Act was amended in 1989 by the Maritime Administration Authorization,[2] and expressly reposes authority over both the RRF and the NDRF in the Department of Transportation (DOT):

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[1] Codified at 50 U.S.C. App. § 1744.

[2] The legislative history of 50 U.S.C. App. § 1744 is somewhat convoluted. Section 6 of the Maritime Administration Authorization, 1990, Pub. L. 101-115, Oct. 13 1989, amended section 11 of the Merchant Ship Sales Act of 1946, and hence also amended 50 U.S.C. App. § 1744. This change was intended, inter alia, to clarify the circumstances and procedures under which vessels in the NDRF could be reactivated. Subsection (b) was inadvertently repealed by section 307(12), Coast Guard Authorization Act of 1989, Pub. L. No 101-225, Dec. 12, 1989, which was intended to repeal the former language in subsection (b) dealing with use of NDRF vessels as training ships for maritime schools. Section 6205(a)(d) of the Oceans Act of 1992, Pub. L. No. 102-587, Nov. 4, 1992, reinstated the provision as it appeared in the Maritime Administration Authorization, 1990, with an effective date of December 12, 1989.

ENCLOSURE (1)

(a) The Secretary of Transportation shall maintain a National Defense Reserve Fleet, including any vessel assigned by the Secretary to the Ready Reserve Force component of the fleet, consisting of those vessels owned or acquired by the United States Government that the Secretary of Transportation, after consultation with the Secretary of the Navy, determines are of value for national defense purposes and that the Secretary of Transportation decides to place and maintain in the fleet.

(b) Except as otherwise provided by law, a vessel in the fleet may be used-

(1) for an account of an agency of the United States government in a period during which vessels may be requisitioned under section 902 of the Merchant Marine Act, 1936 (46 App. U.S.C. § 1242); or

(2) on the request of the Secretary of the Navy, and in accordance with memoranda of agreement between the Secretary of Transportation and the Secretary of Defense, for-

(A) testing for readiness and suitability for mission performance;

(B) defense sealift functions for which other sealift assets are not reasonably available; and

(C) support of the deployment of United States armed forces in a military contingency, for military contingency operations, or for civil contingency operations upon orders from the National Command Authority;

(3) for otherwise lawfully permitted storage or transportation of non-defense related cargo as directed by the Secretary of Transportation with the concurrence of the Secretary of Defense; or

(4) for training purposes to the extent authorized by the Secretary of Transportation with the concurrence of the Secretary of Defense.[3]

The Act's legislative history indicates that this section was intended to set out the terms under which the Navy[4] can activate and use vessels in the RRF, and that the section codifies the then-existing memorandum of agreement (MOA) between DOD and DOT, while providing for subsequent memoranda to implement the basic agreement.[5]

c. The MOA. The MOA to which section 1744 refers was executed, on 26 October 1988, between MARAD, representing DOT, and Commander, Military Sealift Command (COMSC), representing DOD. Article 6 of the MOA, titled "Manning and Operation of RRF Ships," makes clear that the responsibility for manning RRF ships lies with DOT and MARAD --

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[3] Pub. L. No. 101-115, Maritime Administration Authorization, 1990, Oct. 13, 1989, codified at 50 U.S.C. App. § 1744.

[4] The issue of SECNAV's authority to reactivate the RRF is currently being considered by DOD General Counsel. Although section 1744 states that SECNAV shall request the reactivation of the RRF for, inter alia, defense sealift functions for which other sealift assets are not reasonably available, SECDEF, in DOD Directive 5158.4 (United States Transportation Command) of 8 January 1993, delegated to CINCTRANS unrestricted authority, with the approval of SECDEF, to activate the RRF "consistent with applicable law." This transfer of authority, if legal, may supplant SECNAV's "organize, train, equip and mobilize" functions under 10 U.S.C. § 5013 with regards to the RRF. We conclude, nonetheless, that SECNAV would continue to have the responsibility to respond to CINCTRANS' requests for manpower support for the RRF as part of the normal relationship between a Service Secretary and a unified commander. For the purposes of this discussion, the more important aspect of the purported transfer of reactivation authority over the RRF to CINCTRANS is the question of who will decide, on behalf of DOD, to accept vessels from MARAD and DOT if the ships are not fully manned. Once a decision is made to bring the vessels under DOD operational control, we believe military manpower may be assigned as necessary to ensure accomplishment of the military mission.

[5] S. Rep. No. 119, 101st Cong., 1st Sess. 13 (1989), reprinted in 1989 U.S.C.C.A.N. 574, 587.

a. RRF ships will be operated under contract between MARAD and individual companies. Existing agreements will be replaced, as soon as possible, with Ship Manager Contracts (SMC) entered into through competitive processes to the maximum extent practicable. At all times, such contracts will be "in being" and capable of being fully implemented immediately upon notification by COMSC that a determination for activation has been made.

b. On reactivation, RRF ships will remain under the (sic) contract to MARAD (Ship Managers) for the account of the Department of Defense. COMSC will exercise operational control of all ships placed into the active Department of Defense service (emphasis added).[6]

The MOA also discusses temporary transfers of RRF ships to the Navy to meet emergent sealift requirements not otherwise addressed. In such cases, Article 13 of the MOA indicates that during the period of transfer, the assigned contractor remains responsible for the ship, including at-sea operations, under its contract with MARAD.[7]

d. SECNAV Functions. Under section 5013 of title 10, United States Code, SECNAV, subject to the authority, direction, and control of SECDEF, is responsible for, and has the authority necessary to conduct, all affairs of the Department of the Navy, including supplying, equipping, training and mobilizing functions. SECNAV is also responsible for carrying out the functions of DON so as to fulfill (to the maximum extent practicable) the current and future operational requirements of the unified and specified combatant commands.[8]

e. CINCTRANS' Charter and the Responsibilities of the Military Departments. DOD Directive 5158.4 (United States Transportation Command) of 8 January 1993, states that the mission of CINCTRANS is to provide air, land and sea transportation for DOD, in times of both peace and war. To that end, CINCTRANS has combatant command of the Military Sealift

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[6] Memorandum of Agreement Between Department of Defense and Department of Transportation of 26 Oct 88 (effective 30 Oct 88).

[7] Id.

[8] 10 U.S.C. § 5013(c)(4).

Command (MSC) and of all transportation assets of the Military Departments, except for Service-unique or theater-assigned transportation assets. The Secretaries of the Military Departments, on the other hand, have the authority and duty to organize, train, and equip forces for assignment to CINCTRANS, and the authority and duty to program and budget for such assignments.

4. Discussion

a. The statutory base of the NDRF and RRF makes clear that DOT is responsible for maintaining the RRF in readiness for reactivation and mobilization. The MOA between DOT and DOD expressly provides that MARAD will operate RRF ships under contract with individual companies, and that such contracts will be the basis for operating the ships upon reactivation. COMSC exercises operational control of the vessels once they have been accepted by DOD and placed into active DOD service.

b. SECNAV is responsible for organizing, training, and equipping forces for assignment to CINCTRANS (and the other CINCs), as well as for providing programming and budgeting to support such assignments. Once vessels come under DOD operational control, SECNAV has authority and responsibility to respond to requests from CINCTRANS for support as necessary to enable the vessels to execute their military mission.[9] Such support might, for example, take the form of supplying ship's self-defense detachments, special cargo handling crews, or security or communications detachments.

c. Just as assigning a detachment for a specific purpose is clearly within SECNAV's authority and responsibility, assignment of single officers or crew members to support legitimate military mission requirements would also, in our view, be a permissible exercise of SECNAV's authority.[10] Indeed, the Merchant Marine

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[9] 10 U.S.C. § 162 provides for assignment of forces from the Military Departments to combatant commands and 10 U.S.C. § 165 charges the Secretaries of the Military Departments with administration and support of the forces so assigned.

[10] SECNAV's authority stems from 10 U.S.C. § 5013(g), which states in pertinent part:

> The Secretary of the Navy may-
> (1) assign, detail, and prescribe the duties of members of the Navy and Marine Corps and civilian

Reserve component of the U.S. Naval Reserve exists in order to provide a pool of personnel experienced in Navy operations and licensed as Merchant Marine officers to act as liaisons between the Navy and merchant shipping under DOD operational control.[11] Most Merchant Marine Reserve officers serve as Individual Ready Reservists (IRR) in the Merchant Marine Individual Ready Reserve Group (MMIRRG), which is the administrative and training unit for Merchant Marine Reserve officers in a non-drill status.[12] Mobilization policy for MMIRRG officers not serving at sea on mobilization day requires them to be assigned to Navy commands as required to fulfill national emergency requirements.[13]

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personnel of the Department of the Navy; and
(2) prescribe regulations to carry out his functions, powers and duties under this title.

[11] See OPNAVINST 1534.1B, Merchant Marine Reserve, U.S. Naval Reserve Program.

[12] The IRR and Selected Reserve (SELRES) together constitute the Ready Reserve. SELRES units, and any SELRES member not assigned to a particular unit, may be involuntarily ordered to active duty (other than for training) for ninety days (which may be extended for ninety days) when the President determines that it is necessary to augment the active forces for any operational mission under 10 U.S.C. § 673b. Not more than 200,000 members of the SELRES may be on active duty under this section at any one time. Members of the IRR may be recalled under the general recall provision pertaining to the Ready Reserve, 10 U.S.C. § 673, which in time of national emergency declared by the President, authorizes the involuntary recall of any unit and any member not assigned to a unit organized to serve as a unit to active duty (other than for training) for not more than 24 consecutive months. Up to 1,000,000 members of the Ready Reserve may be on active duty without their consent under this section at any one time. We note that there may be many practical problems associated with attempting to man RRF ships in a timely manner using MMR members who are in the IRR, rather than the SELRES. Discussion of these problems is beyond the scope of this paper. We note, however, that redesignating MMIRRG members to the SELRES to improve their training and ability to respond to a recall order will involve a substantial fiscal commitment to stand-up new SELRES units, provide training, and pay associated personnel expenses, including pay, allowances and retirement.

[13] See footnote 11.

d. The MMR, USNR, includes Merchant Marine Reserve Sealift Support billets, which are manpower authorizations in designated Selected Reserve programs that require merchant marine expertise. MSC has units with billets specifically coded for MMR officers. COMSC is the Technical Manager for the MMR, USNR program, and could stand-up additional programs and units to create a manpower pool to provide MMR officers for individual RRF ships to act as liaisons with the Navy.

e. Using Naval personnel to make up the entire crew of a RRF vessels is more problematic. Section 2578 of title 10, United States Code, provides that vessels under the jurisdiction of DOT may be transferred or otherwise made available without reimbursement to a Military Department. As previously mentioned, the 1988 MOA between DOT and DOD, citing the previous codification of section 2578 in section 483a of title 40, authorizes temporary transfers of RRF vessels to the Navy. The MOA, however, provides that such transfers will be funded by the Navy, and that the assigned contractor remains responsible for the ship, including at-sea operations, under its contract with MARAD.[14]

f. If a contracting civilian company were to default in its SMC agreement with MARAD for failing to adequately man a vessel, and MARAD could not otherwise provide a crew under contingency contracts with merchant marine unions, MARAD could conceivably offer the vessel to DOD in a "bare-boat" condition, that is, without crew. The question then would become whether DOD should accept the vessel.

g. DOD acceptance of undermanned or unmanned vessels is a significant shifting of MARAD's burden to DOD. Responsibility for maintaining RRF vessels in readiness for reactivation was placed squarely on DOT by Congress. The current division of crewing responsibility between DOT and DOD, reflected in the existing MOA, were known by Congress when the agreement was codified by the 1989 amendment to 50 U.S.C. App. § 1744. The legislative history of the section does reveal a congressional

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[14] See Article 13 of the MOA between DOD and DOT, dated 30 October 1988.

intent to provide flexibility for subsequent adjustment but changes of this magnitude are cardinal and should not be lightly undertaken.[15]

h. Nonetheless, if the national interest required use of the RRF because other commercial assets were not reasonably available,[16] and RRF vessels could not be manned under the SMC

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[15] The legislative history of the Maritime Act of 1981, which transferred MARAD from the Department of Commerce to the Department of Transportation, lists as a function of MARAD to maintain "a National Defense Reserve Fleet of Government-owned ships which can be activated and operated when national defense needs so require (emphasis supplied)." H. Rep. No. 97-199, 97th Cong., 1st Sess. (1981), reprinted in 1981 U.S.C.C.A.N. 92, 94.

[16] While we conclude that Reserve personnel could be recalled and assigned to RRF vessels when necessary to accomplish a military mission, we do not believe the authority for such assignments extends to routine activation and use of the RRF, particularly if the Reserve members concerned are members of the IRR. As discussed in footnote 12, supra, under 10 U.S.C. § 673b, members of the SELRES may be involuntarily ordered to active duty, other than for training, for up to 180 days when the President determines that such action is necessary to augment the active forces for any operational mission. The involuntary recall of other members of the Ready Reserve, including the IRR, is authorized by 10 U.S.C. § 673, which requires a declaration of national emergency by the President. Moreover, the "fair treatment" provision of section 673(b), which requires consideration of, inter alia, the Reservist's family responsibilities and employment necessary to maintain the national health, safety, or interest, invites litigation. Use of volunteers, while avoiding the implications of an involuntary recall, does not provide a stable manpower pool of known characteristics and training. Use of military personnel, Reserve or Regular, during routine activations is contrary to DOT's and MARAD's contractual obligations under existing SMC's, and conflicts with the MOA executed between DOT and DOD. We do not believe the military mission to provide manning for the RRF arises other than on a contingency basis, given the statutory and contractual basis for maintenance and operation of the RRF currently extant.

agreements between MARAD and civilian companies[17], we believe DOD would be acting within its legal authority to accept vessels from DOT "as is" and provide whatever the necessary manning to accomplish the military mission assigned.[18] Such a dramatic shift of responsibilities from DOT to DOD, however, should not take place without due deliberation. The MOA between DOT and DOD should be updated to include a provision for contingency transfers of RRF vessels from DOT to DOD with partial crews or no crews in the event MARAD were unable to man the vessel under civilian contracts within the required reactivation period, and to expressly provide for the use of military personnel to fill out the crew or man the entire vessel, if necessary.

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[17] We see no issue regarding competition with civilian firms or sources of manpower that would preclude use of Navy crews if the circumstances required immediate manning of RRF vessels and use of military manpower was the only option that would allow accomplishment of the mission within the necessary time frame. It should be noted, however, that under section 901 of the Merchant Marine Act of 1936, as amended by the Maritime Act of 1981 (46 U.S.C. App. § 1242), whenever the President proclaims that the security of the national defense makes it advisable or during any national emergency declared by proclamation of the President, the Secretary of Transportation is authorized to requisition or purchase any vessel or other watercraft owned by citizens of the United States for any period during such emergency. These requisitions or charters may be "time charters," which include use of the vessel's crew, or demise (bare-boat) charters.

[18] Section 262 of title 10, United States Code, provides the purpose of Reserve components:

> The purpose of each reserve component is to provide trained units and qualified persons available for active duty in the armed forces, in time of war or national emergency and at such other times as the national security requires, to fill the needs of the armed forces whenever, during, and after the period needed to procure and train additional units and qualified personnel to achieve the planned mobilization, more units and persons are needed than are in the regular components.

Generally speaking, Reserves on active duty other than for training may be assigned any mission to which a member of a regular component may be assigned. See 10 U.S.C. § 682.

Additionally, since such a shift of responsibility encompasses a function assigned to DOT by Congress, section 1744 of title 50 should be amended to include contingency manning provisions. Such a change would clearly establish military authority and responsibility to man RRF vessels on an emergency basis, would provide clear authorization for fiscal expenditures by DOD to establish the organizational structure and training necessary to implement such a plan, and would buttress Secretarial action to assign military crews to the vessels, if such assignments were challenged in court.

5. Conclusions

a. DOT and MARAD are responsible by statute for maintaining the RRF in readiness for operational use by DOD, and are responsible for manning the vessels under the MOA between DOT and DOD. CINCTRANS has the mission of supplying the transportation needs of DOD in times of peace and war. COMSC exercises operational control over RRF vessels for DOD and CINCTRANS once they have been accepted after reactivation by MARAD.

b. DON could assign naval personnel to support RRF vessels to meet military requirements. Such support could include assignments of special purpose detachments, individual liaison officers, individual crew members, or, if necessary, entire crews.

c. Acceptance of RRF vessels in an undermanned or unmanned condition is a significant shift of burdens from DOT to DOD, and any plan to do so must be fully coordinated between DON, CINCTRANS, CJCS and OSD.

d. Problems associated with manning RRF vessels should be addressed by DON with MARAD, COMSC, and CINCTRANS to reach mutually acceptable solutions.

e. If a contingency plan to crew RRF vessels with military personnel is developed, the responsibility and authority for doing so should be formalized at least by MOA between DOT and DOD, and preferably by amendment to section 1744. Appropriate command structure and billet authorizations, probably within COMSC, should also be established.

Appendix L

THE NAVY MOBILIZATION PROCESS

APPENDIX I TO ANNEX N
THE NAVY MOBILIZATION PROCESS (U)

1. (U) **Scope**. This Appendix discusses the Navy methodology and procedures for mobilization.

2. (U) **The Recall/Mobilization Decision and Requirements Process**.

a. (U) **Recall/Mobilization Sequence**. When a crisis develops the following sequence of events will take place:

(1) (U) The Unified Commander of that geographic region (CINC) will notify the Chairman of the Joint Chiefs of Staff (CJCS).

(2) (U) CJCS will coordinate with the CINC and the NCA to select a course of action (COA). This COA will either be derived from an existing Operation Plan or will be planned and executed under crisis action procedures. In either case, force requirements to execute the approved COA must be determined.[1]

(3) (U) The total of these forces will then determine whether reserve volunteers are sufficient or involuntary reserve activation is required, and if required, under which legal authority.

(4) (U) Navy planning requirements are forwarded by the CINCs, Navy Component Commanders and Sponsors to the Deputy Chief of Naval Operations (Plans, Policy and Strategy), N3/N5.

(5) (U) These accumulated Navy requirements are then coordinated with the Director for Logistics, Joint Staff (J-4). J-4 consolidates all Service reserve requirements and forwards them to CJCS who will brief the NCA (see Figure N-I-1).

(6) (U) Once the NCA has determined that involuntary activation is required, the President may invoke either the Presidential Selected Reserve Call-Up (10 USC 673b) or Partial

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[1]In the past, force requirements meant combat forces. This provided a false picture of the true logistical lift, employment and sustainment requirements. In March 1992, Joint Pub 5-03.2 directed force planners to calculate the required combat, combat support and combat service support forces, from both the active and reserve components, required for the theater of operations, Supporting Commanders, CONUS requirements to deploy the force, and backfill deployers.

Mobilization Coordination

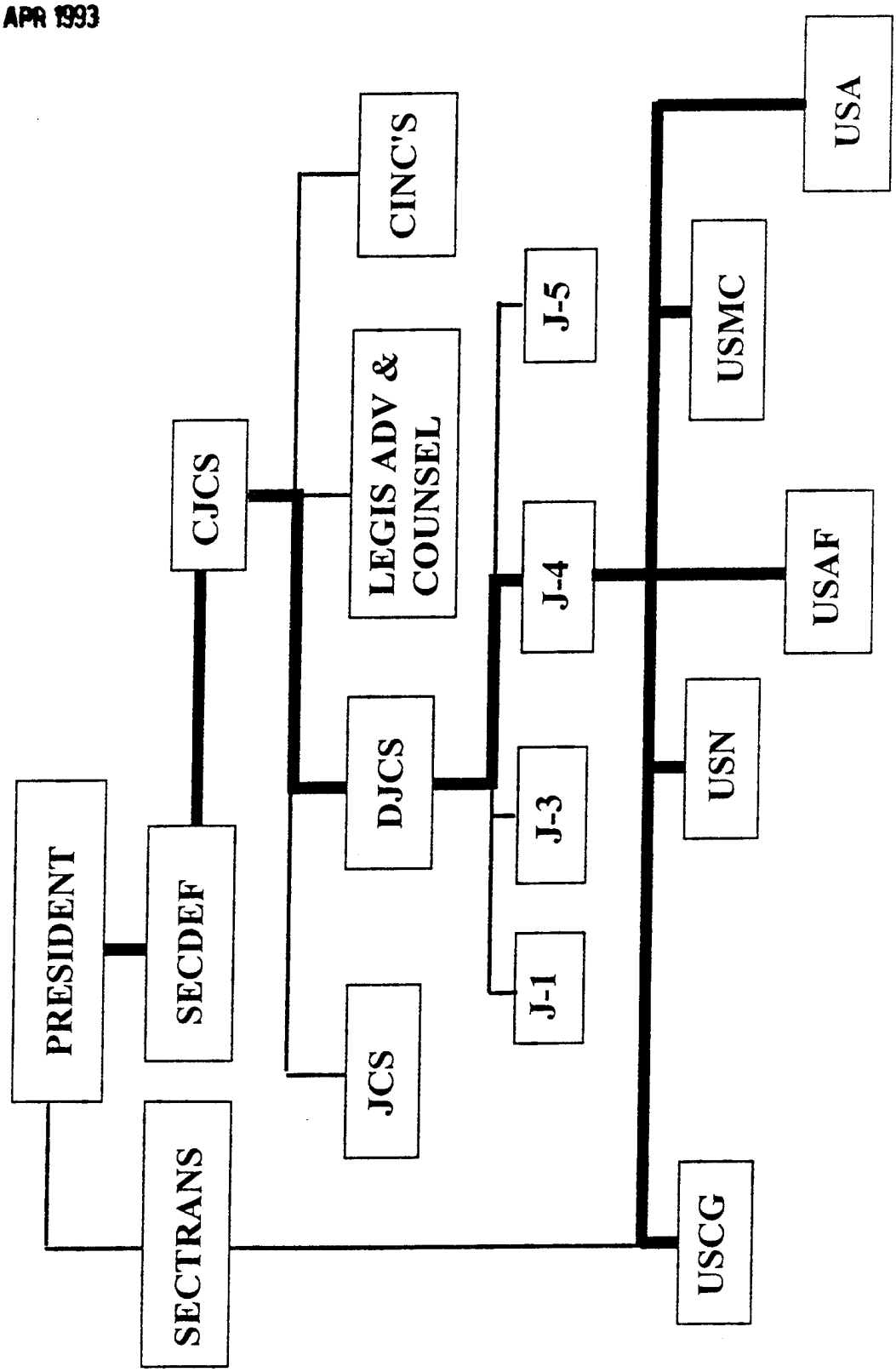

FIGURE N-I-1

Mobilization (10 USC 673) (Partial Mobilization requires the declaration of a National Emergency).

(7) (U) Once invoked by the President, the authority is then delegated to the Secretary of Defense. The Secretary of Defense allocates a portion of that authority to each of the Service Secretaries based on reserve force requirement projections.

(8) (U) The Secretary of the Navy will then delegate that reserve call-up/mobilization authority to the CNO (N3/N5) for execution.

(9) (U) N3/N5 reviews CINC-validated requirements for priority, policy, and appropriate assets (coordination with N1 is required to validate the decision to meet requirements with active Navy, SELRES, civilian, Individual Ready Reserve (IRR), Standby or Retired personnel manpower).

(10)(U) Coordination is conducted with the Commandant of the Marine Corps (CMC) to determine Navy medical requirements for ground and air units as well as Chaplains and Religious Specialists (see Figure N-I-2).

(11)(U) N3/N5 will process incoming requests for involuntary reserve recall/mobilization, prioritize the requirements in coordination with CINCs, Navy Component Commanders and Sponsors as necessary, taking into consideration lead times, any N1 requests for lead time waivers, and additional CMC coordination requirements.

(12)(U) N3/N5, with N095 assist, will transmit the SELRES requirements to COMNAVRESFOR.

(13)(U) If the requirements can not be met with the SELRES, and Partial Mobilization is invoked, requirements will be forwarded by N3/N5 to N1 to be filled by Pre-trained Individual Manpower (PIM) assets. N1 will transmit the PIM requirements to NAVRESPERSCEN.

b. **Naval Reserve Requirements Sequence**. The following data must be included with the gaining command's reserve requirements request:

Navy Recall / Mobilization Flow

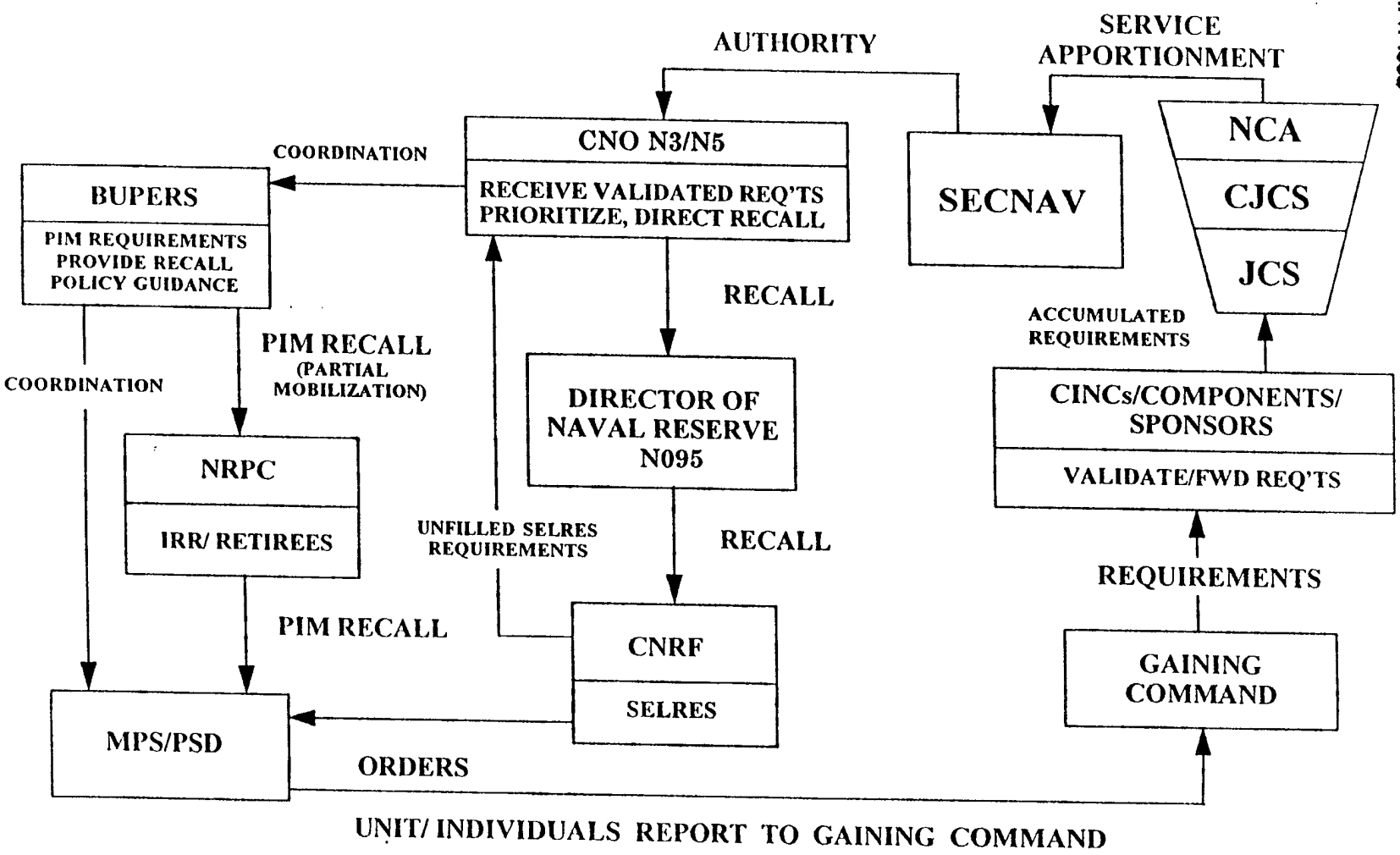

FIGURE N-I-2

(1) (U) **Unit Identification**

(a) (U) Active Unit Identification Code (AUIC)/ Reserve Unit Identification Code (RUIC)/name of unit to be recalled.

(b) (U) Required Delivery Date (RDD) (that unit must be at the gaining command allowing for lead time/request for waiver of lead time).

(c) (U) Estimated Available to Load Date (ALD) member(s) should be at the Point of Embarkation (POE).

(d) (U) Gaining command Unit Identification Code (UIC).

(e) (U) Name of command that will receive member in theater.

(f) (U) Special instructions, if any, which may include intermediate staging area for specialized pre-mobilization training, requirements for organizational gear, special instructions for climate or terrain expected, etc.

(2) (U) **Billet/Individual Information**. List by AUIC/Reserve Billet Sequence Code (RBSC) with name, rank/rate, SSN, and when needed at gaining command within each AUIC/RUIC for each prospective unit to be called up. Notations by each listed member must include one of the following:

(a) (U) Recall ONLY individual listed by name/SSN.

(b) (U) Recall any billet incumbent at time of call-up (this is default if (a) is not indicated).

1. (U) CINC/Sponsor should expect to call up whomever is filling billet at time of call-up. Access to current Reserve Unit Assignment Document (RUAD)/Billet Personnel (BILPERS) is essential.

2. (U) If CINC/Sponsor wants a specific person, correctly identifying an individual will prevent problems if the person is filling a valid but different billet at time of call-up.

3. (U) Administration support billets (those not identified as mobilization requirements which have been added to the reserve unit structure for the purpose of management or administration of the unit (e.g., Commanding Officer, Executive

Officer, etc)) will not be recalled without specific justification and validation via the chain of command. Recall/mobilization of personnel assigned to administration support billets may be needed to provide unit leadership during activation processing, transportation to, and integration into the gaining command. Recall of these personnel should normally be terminated once the unit is fully integrated, unless the member can be reassigned to a valid mobilization requirement.

(3) (U) **Logistics Guidance (Personnel and Equipment/ Platform)**

(a) (U) For commissioned units or for augment units with 100 or more members being called up and "staged" for transportation at the same location, the CINC/Sponsor should provide input for all AUIC/RUIC/RBSC combinations to the appropriate Time Phased Force Deployment Data (TPFDD). This will ensure proper U.S. Transportation Command (TRANSCOM) coordination.

(b) (U) Non-TPFDD individuals or groups of less than 100 without cargo travelling out of CONUS can expect to be transported to an Airport of Embarkation where routinely scheduled "channel flights" will transport them to their gaining command. Embarkation site identification and channel flight scheduling will be at the discretion of TRANSCOM.

(4) (U) **Points of Contact**. Abbreviated mission/ justification statement and Point of Contact (POC), with 24 hour access phone numbers, telephone facsimile number (FAX), and command message address is also required with request.

(5) (U) **Format**. Figure N-I-3 provides the format for billet/individual identification of the mobilization requirements data to be submitted with request by the CINC to N3/N5.

3. (U) **Call-Up Order Implementation**

a. (U) Once identified, an implementation order will be prepared as required for N3/N5 signature, directing COMNAVRESFOR to recall and activate the identified units and/or individuals of the SELRES. COMNAVRESFOR will then issue activation orders for these units and/or individuals.

b. (U) Once PIM members are identified, N3/N5 will prepare the implementation order for N3/N5 signature directing N1 to recall/mobilize the identified individuals of the PIM. N1 will then direct NAVRESPERSCEN to issue activation orders to those

BILLET/INDIVIDUAL IDENTIFICATION:

RUIC	APC	RESERVE UNIT	RESERVE ACTIVITY AND LOC	ST	RC	NRA	RPC	RPTM	PRI
07957	1905427	USS CONSTANT NRF	N&MCRC SAN FRANCISCO	CA	19	1942	02A1	34	IA

RBSC	AUIC	ARATE	RFAS	ANECASNE	IRATE	ADTE	SSN	NAME	IRAD	PNECSNEC	RUIC	RLD	GCUIC	POE
0226I	07957	QM3	FAAM		QM3	0890	550533180	BOOTH	XXA90	0000	07957	03-19-91	07957	NPTO
7010I	07957	SMSN	FAAM		SMSA	0890	559673763	NELSO	XXA80	0000	07957	03-19-91	07957	NPTO
7009I	07957	OSSN	FAAM		OS3	0890	061645521	COLEM	XXA90	0000	07957	03-19-91	07957	NPTO
0227I	07957	ET3	FABM	14441425	ET2	1090	228946606	CLARY	XXABO		07957	03-19-91	07957	NPTO
0240I	07957	MS3	FAAM		MSSR	0391	197545041	LEE L	XXA31	9700	07957	03-19-91	07957	NPTO
0228I	07957	MS3	FABM		MS3	0391	288600075	AUSTI	50M31		07957	03-19-91	07957	NPTO
7007I	07957	SN	FAZM	9700	BM2	0990	535888880	BARST	XXA90	0000	07957	03-19-91	07957	NPTO
0230I	07957	SN	FAZM	9700	SN	0391	547637051	SMIRL	25M31	97000000	07957	03-19-91	07957	NPTO
7006I	07957	SN	FAZM	9700	SN	1090	547710242	LEONG	XXAA0	9730	07957	03-19-91	07957	NPTO
0246I	07957	EN2	4AAM		EN2	0890	152522173	DIETZ	XXA80	0000	07957	03-19-91	07957	NPTO
0247I	07957	EN3	FAAM		EN2	0291	448660120	HERRE	50N31		07957	03-19-91	07957	NPTO
...IAP...														
99999	J1050				BM3	0291	154709324	GIRON			07957	03-19-91	07957	NPTO

Figure N-I-3

individuals. Additionally, NAVRESPERSCEN will notify these individuals of their pending mobilization via mailgram, providing specific reporting instructions for processing.

c. (U) **Call-Up Order Passed to Echelon IV**. COMNAVRESFOR, in coordination with COMNAVAIRESFOR and COMNAVSURFRESFOR, will

transmit implementing SELRES call-up events to Echelon IV commands.

d. (U) **Call-Up Order Passed to Echelon V**. COMNAVRESFOR Echelon IV will implement SELRES call-up to the Naval Reserve Activity (NRA).

e. (U) **Call-Up Order Passed to Unit/Individual with Reporting Instructions**

(1) (U) The NRA will notify the Commanding Officer of the SELRES unit/individual(s) being called-up and provide: who is being called-up, when to report (allowing lead time), where to report, how to get there, what to bring (e.g., organizational clothing) and special instructions (e.g., no contact lenses if going to desert, only cotton uniforms for shipboard use).

(2) (U) The unit/individual reports for NRA processing.

(3) (U) The NRA will issue standardized orders directing the recalled unit/member from their home of record to the gaining command via MPS and any other intermediate stops.

4. (U) **Activation, Mobilization, De-mobilization, and Deactivation**

a. (U) **Personnel Activation Policy**

(1) (U) N1 will provide personnel policy on exemptions, deferments, stop loss (if authorized) and family support.

(2) (U) N1 will provide policy and procedures for orders to members recalled.

(3) (U) N1 will provide coordination support for Navy Passenger Transportation Office (NAVPTO) arranged travel to groups or individuals not specifically included by CINC planners in the OPLAN TPFDD.

b. (U) **Activation Processing**. The recalled unit/member is

notified by and travels to the assigned NRA for initial mobilization processing. Orders, records and equipment, if applicable, are prepared for units/members sent to the MPS for final mobilization processing.

c. (U) **Mobilization Processing**. The recalled unit/member travels to MPS on orders where local access is available to essential support facilities to complete processing to active duty. (It should be noted that the MPS can also assist with the processing of civilian members who are being mobilized to travel to theater, since much of the needed information and services are similar.) Policy, specific details of the call-up order and special instructions will be provided by the MPS.

(1) (U) **Personnel/Pay Record Activation by the MPS PERSUPPDET**. The supporting PERSUPPDET will use the pre-staged personnel record to complete the required Source Data System (SDS) events gaining member to active duty and creating a pay record.

(2) (U) **Release to Gaining Command**. The NAVPTO arranges transportation of the members/units to the gaining command, required enroute training, or to Port(s) of Embarkation (POE).

(3) (U) **Mobilization Status Update/Gaining Command Notification**. The MPS will report release status to COMNAVRESFOR and NAVRESPERCEN whom will transmit consolidated status to N1 daily. N1 will use these reports as input for its daily mobilization status report to JCS. N1 will sort daily SDS transmissions by gaining command (UIC) and provide a list with NAME, RANK/RATE, SSN, and DATE released from MPS to the supporting PERSUPPDETs for all INCONUS gaining commands. Those commands that are OUTCONUS will be sent recurring messages providing status of reservists assigned to them. MINIMIZE should not prevent transmission of these messages, but this should be determined **beforehand.** N1 is responsible for status on all personnel (SELRES and PIM) processed through the MPS.

(4) (U) **Unit Contact with Gaining Command**. The unit (and, in some cases, the individual) may communicate through the chain of command to the gaining command. Liaison is often necessary for large group coordination.

(5) (U) **Receipt at Gaining Command**. The unit or member is received at the gaining command and the gain is transmitted by the command through the supporting PERSUPPDET or Diary Message Reporting System (DMRS).

d. (U) **Demobilization Processing**. Successful demobilization

is largely dependent upon the success of the call-up process that includes correct completion of personnel and pay system entries, control of the service records and transporting members back through the same MPS that received the members for processing on active duty, whenever possible. The demobilization process must provide for SDS or DMRS personnel accounting upon receipt, transfer and ultimate release from active duty for each recalled reserve member.

(1) (U) Upon the actual transfer of the members back to their original MPS, the activity effecting the transfer shall report an officer or enlisted transfer entry/event via SDS or DMRS.

(2) (U) Upon the member's arrival at the MPS, the MPS shall also report the appropriate discharge or release from active duty event/entry for separation from active duty status.

(3) (U) The following steps provide expanded explanations on the demobilization process:

(a) (U) **Release Notification**. Gaining command notifies the CINC upon completion of the unit/individual's mission. The CINC determines whether the unit/individual's skills are required to complete any other mission within the AOR. If not, the gaining command notifies N1 and MPS PERSUPPDET by message of projected release date of all members at least one week in advance and provides any known transportation arrangements. The N1 Emergency Response Cell (ERC) will monitor the transfer of all members back to their original MPS using information from TPFDDs for large groups, CINC transportation officers, etc. Ultimate responsibility for the member's welfare during the transfer back to the MPS for demobilization processing rests with the gaining command and the applicable CINC.

(b) (U) **MPS Demobilization Processing**. For those members fit for release or discharge from active duty, MPS will provide a loss entry to SDS that should trigger an automatic crediting of retirement points data to IMAPMIS. MPS will also provide COMNAVRESFOR with a status update of all members processed including those on medical hold, judicial hold, etc. Those that have been released from active duty and are eligible to return to a drill status will be identified at that time and directed to proceed to their NRA for deactivation.

e. (U) **Deactivation Processing**. For those members released from active duty, NRA will screen and affiliate qualified members back into a drilling status, performing associated administrative actions. The member is then released to an inactive status.

5. (U) **Reporting Requirements**

a. (U) **Creation of Pending Record and Congressional Notifications from Call-Up Data**. For each call-up increment, COMNAVRESFOR will provide NAVRESPERSCEN a daily file identifying each prospective SELRES recallee. NAVRESPERSCEN will add prospective PIM recallees and will transmit this entire file to

N1. This data file will then be used as input for the following functions:

(1) (U) N1 will pre-stage pending officer and enlisted records at the PERSUPPDETs supporting the MPS processing each recalled Reservist to ensure timely creation of accurate strength, personnel, and pay records.

(2) (U) N1 will create a list that N095 will provide to the Office of Legislative Affairs (OLA) to use as an enclosure for Congressional notification of each reserve call-up order. A copy will be provided to Chief of Naval Information (CHINFO), the N1 ERC, Office of the Secretary of Defense (OSD), and other appropriate commands.

(3) (U) N1 will build updated Officer Personnel Information System (OPINS) and Navy Enlisted Personnel System (NES) master files specifically flagged (voluntary or involuntary) for current call-up. These files, which should be created within 72 hours to precede the first reporting reservists, will be updated with current status (described later) and sorted as a cumulative weekly report to OSD/JCS, to OLA (to help answer media or Congressional inquiries), and to the Navy Command Center, N095, COMNAVRESFOR and the N1 ERC. Until the member actually reports for processing to active duty, the master record will be a "pending record". This "pending record" is important to track status and to answer numerous inquiries.

(4) (U) N1 will activate billets when validated for recall by N3/N5, including new billets supporting emergent requirements.

b. (U) **NRA Status Update to Echelon II**. When NRA processing is complete, the NRA reports to COMNAVRESFOR the activation status of the SELRES member as follows:

(1) (U) Delayed/exemption request pending.

(2) (U) Released to next enroute stop on orders (to MPS or to designated training or staging site).

(3) (U) Non-mobilized status.

c. (U) **MPS Status Update to Echelon II**. When MPS processing is complete, the MPS reports the mobilization status of SELRES to COMNAVRESFOR and PIM plus any other (i.e. civilian) members to N1 as follows:

(1) (U) Delayed/exemption requests pending.

(2) (U) Released to next enroute/gaining command on orders (member may have training enroute to gaining command).

(3) (U) Non-mobilization status.

Appendix M

REQUIREMENTS AND PROCEDURES FOR MASTER AND CHIEF ENGINEER SELECTION BOARD

DEPARTMENT OF THE NAVY
COMMANDER MILITARY SEALIFT COMMAND
WASHINGTON, D.C. 20398-5100

REFER TO
COMSCINST 12330.1A
N1
02 FEB 1990

COMSC INSTRUCTION 12330.1A

Subj: REQUIREMENTS AND PROCEDURES FOR MASTER AND CHIEF ENGINEER SELECTION BOARD

Ref: (a) Civilian Marine Personnel Instruction 340 (Position Changes)

Encl: (1) Promotion Evaluation (Civilian Marine Officers) (MSC 12330/4) (Rev 2-88)
(2) Applicant Evaluation Summary Sheet (MSC 12330/5) (Rev 1-90)
(3) Rating Sheet for Master and Chief Engineer Candidates (MSC 12330/6) (Rev 8-89)
(4) Voting Ballot (MSC 12330/7) (Rev 2-88)
(5) MSC Biographical Data (MSC 12330/8) (Rev 4-88)

1. Purpose. To establish policy and provide guidance for the program governing permanent promotions to Master and Chief Engineer positions in the Military Sealift Command (MSC) and to establish procedures for submission of biographical information for MSC Masters and Chief Engineers.

2. Cancellation. COMSCINST 12330.1.

3. Policy. It is COMSC policy, through an effective promotion program, to provide opportunity for progressive development and advancement of civilian marine personnel, in accordance with reference (a).

a. Masters and Chief Engineers hold key management positions aboard MSC ships. They must exemplify the highest standards of leadership, professionalism, and personal integrity. Mariners selected for these positions will demonstrate they are fully capable of meeting demands of assignment and willing to accept the increased responsibility and accountability associated with such positions. They are responsible for maintaining MSC ships at the highest state of operational readiness, smartness, and material condition. Their vital role in accomplishing MSC's mission cannot be overemphasized.

b. COMSC is an equal opportunity employer. All applicants meeting minimum qualifications will receive consideration without regard to age, sex, race, religion, national origin, lawful political affiliation, physical handicap, marital status, membership or non-membership in an employee organization, or any other personal condition unrelated to the applicant's basic ability to perform satisfactorily in higher positions.

4. Master/Chief Engineer Promotion Board. The board convenes at COMSC Headquarters, and is scheduled to best meet the anticipated manpower requirements of COMSCLANT and COMSCPAC.

5. Composition. The board will consist of the following members:

R) a. Deputy Commander (COMSC N02) or COMSC designee, President

b. Director for Operations, COMSC (N3) or designee

c. Director for Engineering, COMSC (N7) or designee

R) d. COMSCLANT (N00)

R) e. COMSCPAC (N00)

f. 2 Masters (COMSCLANT)

g. 2 Masters (COMSCPAC)

h. 2 Chief Engineers - 1 steam, 1 diesel (COMSCLANT)

i. 2 Chief Engineers - 1 steam, 1 diesel (COMSCPAC)

j. Administrative support will be provided by:

(1) COMSC (N12) - Recorder

(2) COMSCLANT/COMSCPAC staff members - Area Command Recorders

6. Minimum Eligibility Requirements. To meet minimum eligibility requirements, each applicant must:

a. possess a current, valid, unlimited U.S. Coast Guard License for Master, Ocean Steam and Motor Vessels or Chief Engineer, Steam Vessels or Chief Engineer, Motor Vessels;

b. have permanent status with MSC;

c. have sailed with MSC for at least one year as First Officer (for position of Master) or First Assistant Engineer (for position of Chief Engineer) and be a permanent First Officer or First Assistant Engineer; and

d. have a current physical examination, in accordance with COMSCINST 6000.1B, on record.

7. Applicant Review. Candidates will be reviewed and rated by at least two board members who will present the candidate's credentials to the board and recommend selection or non-selection.

a. Board review, rating, and recommendations will be based on Promotion Evaluations, awards, quality of experience, recency of seagoing service, judgment, technical ability, and, if appropriate, disciplinary actions. In addition, the candidates' demonstrated ability or clear potential to manage resources and supervise employees will be a factor in the decision to recommend a candidate for selection. In this instance, supervisory and managerial potential should be evidenced by sustained successful performance as First Officer, First Assistant Engineer responsible for managing department operations and personnel. (R

b. Evaluation information is a primary source of background for recommending candidates. To ensure that evaluation information is current and complete, the following policy will govern submission of promotion evaluations:

(1) Evaluations must cover all shipboard assignments of 45 days or more.

(2) Supervisors must evaluate all employees under their supervision for 45 days or more.

(3) New evaluations will be submitted for all promotion eligibles whose evaluation of record was completed more than 180 days prior to the closing date of current promotion announcement or whose level of performance has changed significantly (declined or improved) since most recent evaluation of record. Area Commanders will ensure that all information submitted by Subarea Commanders is forwarded for board review. Area Commanders will be held accountable for the validity and currency of information submitted for Board review. (R

8. Procedures for Voting. Nine members comprise the full board. Board President, Area Commanders, Director, Operations Directorate, and Director, Engineering and Ship Introduction will vote on all applicants. Fleet Masters will vote on applicants for promotion to Master, Fleet Engineers will vote on applicants for promotion to Chief Engineer. Vote is by secret ballot. (R

9. Selection for Promotion. Prior to adjourning, full board will review and certify a roster of employees recommended for promotion. Board President will send this roster, and qualification and evaluation information on recommended selectees to COMSC for approval. Board results are strictly confidential and will not be disclosed.

10. Responsibilities

a. COMSC (N12) will:

(1) Schedule and announce board. (R

(2) Provide administrative assistance. (R

R) (3) Prepare letter and qualifications documents for N00 review and approval of board selection recommendations.

R) (4) Notify Area Commanders by message of final selection decision.

(5) Prepare personal letters notifying selectees.

R) (6) Retain records, excluding working documents, of board proceedings for a two-year period following the conclusion of board.

b. Area Commanders will:

(1) Serve as board members (COMSCPAC and COMSCLANT).

(2) Appoint Fleet Masters and Chief Engineers as members.

(3) Appoint staff members to provide administrative and recorder assistance.

(4) Notify marine personnel on leave, training, etc. of promotion opportunities.

(5) Coordinate, compile, and provide applicant information packets.

R) (6) Certify that all candidates forwarded for consideration are fit for duty and have a current physical examination on record.

(7) Analyze mission requirements, ship activation/deactivation, and manning requirement information to determine manning level requirements and number of selections required to meet authorized manning levels plus pipeline R) authorization. This information must be forwarded to N1 three weeks prior to board.

(8) Submit all information pertaining to conduct or performance of promotion candidates submitted by Subarea Commanders.

(9) Notify COMSC (N12) of separation of Masters and Chief Engineers within 30 days of separation.

(10) Submit to COMSC (N12) biographical information on all employees permanently promoted to Master and Chief Engineer within 60 days of promotion action.

(11) Review biographical information annually to ensure that R) information is current. Revised biographical information (MSC 12330/8) will be forwarded to COMSC (N12) as of 1 July each year. Photographs will be updated as necessary to reflect current features.

11. Exceptions. In emergency situations when operational necessity dictates, Area Commanders may request COMSC approval of additional promotions. Requests will be considered on a case-by-case basis and must contain specific information to include: number of Masters/Chief Engineers on board, number of

ships currently operated, employee qualification information, full justification for request (i.e. retirement, long-term not-fit-for duty, etc.).

12. Master and Chief Engineer Promotion Board Forms. The following forms, with the exception of the MSC 12330/8 as noted below, are used for Master and Chief Engineer Promotion Board. (R

a. Enclosure (1) (MSC 12330/4) (Promotion Evaluation)(Civilian Marine Officers). This form is completed as required in paragraph 7 above. Area Commands will forward all promotion evaluations completed for promotion candidates.

b. Enclosure (2) (MSC 12330/5) (Applicant Evaluation Summary Sheet). This two-page form is used for reference by board members when they review an applicant's background. Page one lists the same categories as performance evaluation and summarizes ratings the mariner received in each area for each evaluation. For example, if a mariner received 4 Outstandings, 4 Excellents, and 7 Goods, on the evaluation, 4, 4 and 7 would be placed on summary sheet in appropriate column for each category, next to dates of the evaluation. Column 3 of Section 1 (Period of Evaluation) will reflect the inclusive dates of the evaluation period. For example: 11-15-86 - 3-12-87. Page 2 provides a more detailed summary of mariner's background.

c. Enclosure (3) (MSC 12330/6) (Rating Sheet for Master and Chief Engineer Candidates). This sheet is used by board members to rate an applicant in various categories.

d. Enclosure (4) (MSC 12330/7) (Voting Ballot). This ballot is used by board members to recommend a mariner for promotion. Board members vote by secret ballot using this form.

e. Enclosure (5) (MSC 12330/8) (MSC Biographical Data). This form will provide background information on Masters and Chief Engineer. It will be completed after selection. Information supplied is voluntary and will be used for purposes as described on the form. (R

13. Forms. Supplies of MSC 12330/4, 12330/5, 12330/6, 12330/7, and 12330/8 may be requisitioned from COMSC (Attn: N0021).

Distribution:
(See page 6)

Distribution:
SNDL 41B (MSC Area Commands) (LANT & PAC only) (50)
T-100 (Masters, civil service manned ships)

Copy to:
SNDL 41B (MSC Area Commands) (FE, EUR, and SWA only) (10)
41C (MSC Subarea Commands) (5)
41D3 (MSC Offices)
41J (OICMILDEPTs)
CNO
CINCLANTFLT
CINCPACFLT
CTF 73
CTF 63

Appendix N

"U.S. NAVY RATINGS CROSSOVER TO QMED RATINGS" and EXTRACT FROM U.S. COAST GUARD MARINE SAFETY MANUAL

U.S. Department of Transportation

United States Coast Guard

Memorandum

Subject: U.S. NAVY RATINGS CROSSOVER TO QMED RATINGS

Date: 11 December 1992

Reply to: G-MVP-5
Attn. of: Brandt
7-2701

From: Lee R. Brandt BTCM, USN(RET)

12/14

To: Deputy Chief, Merchant Vessel Personnel Division
Via: Chief, Merchant Vessel Personnel Examination Branch
Chief, Engineering Section

1. The following is my view on which U.S. Navy Ratings and Ranks would crossover to the maritime QMED Ratings of Wiper, Fireman/Watertender, and Oiler:

(a) A U.S. Navy Fireman, paygrade E-3 and E-2, that served in the U.S. Navy Ratings of Boiler Technician, Machinist Mate, and Engineman can qualify as a Merchant Wiper. I have picked the fireman, because just like the merchant wiper it is an entry level position.

The U.S. Navy Fireman, who has gained experience as a Boiler Technician, is trained in the operation and maintenance of various boilers types and associated equipment. As well as evaporators, and low pressure air compressors. Generally they stand watches as a fireroom messenger, burnerman, and assist the Petty Officer in equipment repairs.

The U.S. Navy Fireman, who has gained experience as a Machinist Mate, is trained in the operation and maintenance of steam engines and associated equipment. As well as evaporators, generators, high pressure air compressors, galley and laundry equipment, and auxiliary diesel engines. Generally they stand watches as an engineroom messenger, pumpman, throttleman, evaporator watch, and assist the Petty Officer in equipment repairs.

The U.S. Navy Fireman, who has gained experience as an Engineman, trained in the operation and maintenance of various diesel engine types and associated equipment. As well as evaporators, low pressure air compressors, diesel engine generators, and galley and laundry equipment. Generally they stand watches as an engineroom messenger, evaporator watch, and assist the Petty Officer in equipment repairs.

(b) U.S. Navy Boiler Technician Third Class and Boiler Technician Second Class can qualify as a Merchant Fireman/Watertender. Their training is primarily focused in fireroom operation and maintenance. Their tasks also include repairing equipment under direct supervision. Their training has also included engineroom operation. Generally they stand watches as burnerman, checkman, and pumpman. The Senior Boiler Technician Second Class will usually be the Boiler Technician of the watch, and will be the person in-charge of the watch team.

U.S. Navy Machinist Mate Second Class can qualify as a Merchant Fireman/Watertender but will require additional hands-on in boiler operation and maintenance. Their Personnel Qualification Standard(PQS) would require them to learn the theory of boiler operation and to perform different tasks in the fireroom to qualify as Machinist's Mate of the watch.

(c) U.S. Navy Machinist Mate Third Class and Machinist Mate Second Class can qualify as a Merchant Oiler on both a steam and diesel vessel. Their training is focused on both engineroom operation and maintenance, and auxiliary diesel engine operation and maintenance. Their tasks also include repairing equipment under direct supervision. Generally they stand watches as throttleman, pumpman, and generator watch. The Senior Machinist Mate Second Class will usually be the Machinist Mate of the watch. The Machinist Mate of the watch is the person in-charge of the watch team and also works closely with the Engineer Officer of the Watch.

Engineman Third Class and Engineman Second Class can qualify only as a Merchant Oiler on a diesel vessel. Their training is primarily focused in diesel engine operation and maintenance. Their tasks also include repairing equipment under direct supervision.

Boiler Technician Second Class can qualify as a Merchant Oiler on a steam vessel only and will require additional hands-on experience with purifiers and generators. Their Personnel Qualification Standard(PQS) would require them to learn the theory of engineroom operation and to perform different tasks in the engineroom to qualify as Boiler Technician of the watch.

2. In recent years the U.S. Navy has required engineering personnel to do more cross training. To provide a better trained engineer, the Navy has developed the Personnel Qualification Standards. Some ships have taken this training one step further by temporarily assigning personnel to other divisions for short periods to get actual hands-on experience in other areas.

Example 1: A BT3 is assign to the A-division for three months to learn about diesel engines, small boats, galley and laundry equipment, and refueling helicopters.

Example 2: During the ship's Propulsion Examination Board Operational Propulsion Plant Examination, the Boiler Technician of the Watch is questioned primarily on engineroom plant operation and on auxiliary diesel generators operation. The Propulsion Examination Board members will require the Boiler Technician of the watch to explain how that plant's system interfaces with the fireroom systems. The Machinist Mate of the watch would be drill on the fireroom operation.

LEE R. BRANDT
BTCM USN(RET)

SUGGESTED SEA SERVICE BY RATING

PERCENTAGE OF SEA SERVICE USED FOR LICENSE AND UNLICENSED SERVICE

NAVY AND COAST GUARD RATINGS and THEIR EQUIVALENCIES	Deck 100%	Deck 50%	QMED 100%	QMED[1]	Purser 100%	Purser[2]	Purser 50%	Jr.Asst. Purser
Aerographer's Mate (AG)								
Air Traffic Controller (AC)								
Aircraft Survival Equipmentmen (PR)								
Aviation Antisubmarine Warfare Operator (AW)								
Aviation Antisubmarine Warfare Technician (AX)								
Aviation Boatswain's Mate (AB), (ABE), (ABF), (ABH)								
Aviation Electrician's Mate (AE)								
Aviation Electronics Technician (AT)								
Aviation Fire Control Tech. (AQ)								
Aviation Machinist's Mate (AD)								
Aviation Maintenance Admin. (AZ)								
Aviation Ordnanceman (AO)								
Aviation Storekeeper (AK)								
Aviation Structural Mechanic (AM), (AME), (AMH), (AMS)								
Aviation Support Equipment Tech (AS)								
Aviation Survivalman (ASM)								
Boatswain's Mate (BM)	XXX							
Boiler Technician (BT)			XXX					
Builder (BU)								
Construction Electrician (CE)								
Construction Mechanic (CM)								
Cryptologic Technician (CT), (CTA), (CTR), (CTO), (CTI), (CTM), (CTT)								
Damage Controlman (DC)				XXX				
Data Processing Technician (DP)								XXX
Data Systems Technician (DS)								
Dental Technician (DT)								
Disbursing Clerk (DK)					XXX			
Electrician's Mate (EM)-COAST GUARD			XXX					
Electrician's Mate (EM)-NAVY				XXX				
Electronics Technician (ET)								
Electronic Warfare Technician (EW)								
Engineering Aid (EA)								

1 S T R U L E: CALCULATE 60% OF QUALIFYING TIME **T H E N** APPLY ADDITIONAL % AS SHOWN ABOVE

---

[1] QMED 100% only for standing engineroom watches: watchstanding must be documented.

[2] Purser 100%: must be a PO1 through MCPO, OR, PO2 for 5 years in supervising and ordering.

SUGGESTED SEA SERVICE BY RATING

PERCENTAGE OF SEA SERVICE USED FOR LICENSE AND UNLICENSED SERVICE

NAVY AND COAST GUARD RATINGS and THEIR EQUIVALENCIES	Deck 100%	Deck 50%	QMED 100%	QMED[3]	Purser 100%	Purser[4]	Purser 50%	Jr. Asst. Purser
Engineman (EN)			XXX					
Equipment Operator (EO)								
Fire Controlman (FC)								
Fire Control Tech. (FT) COAST GUARD								
Fire Control Tech. (FT) NAVY (FTB), (FTG)								
Fire and Safety Technician (FS)								
Gas Turbine Systems Tech. (GS), (GSE), (GSM)			XXX					
Gunner's Mate (GM)		XXX						
Health Services Tech. (HS)								XXX[5]
Hospital Corpsman (HM)								XXX[5]
Hull Maintenance Tech. (HT)				XXX				
Illustrator Draftsman (DM)								
Instrumentman (IM)								
Intelligence Specialist (IS)								
Interior Comm. Electrician (IC)								
Investigator (IV)								
Journalist (JO)								
Lecalman (LN)								
Lithographer (LI)								
Machinery Technician (MK)			XXX					
Machinery Repairman (MR)			XXX					
Machinist's Mate (MM)			XXX					
Marine Science Technician (MST)								
Master-at-Arms (MA)								
Mess Management Specialist (MS)						XXX		
Mineman (MN)								
Missile Technician (MT)								
Molder (ML)								
Musician (MU)								
Navy Counsler(CC)								
Ocean Systems Technician (OT)								
Operations Specialist (OS)	XXX							

1 S T R U L E: CALCULATE 60% OF QUALIFYING TIME
T H E N APPLY ADDITIONAL % AS SHOWN ABOVE

---

[3] QMED 100% only for standing engineroom watches; watchstanding must be documented.

[4] Purser 100%: must be a POI through MCPO, OR, POZ for 5 years in supervising and ordering.

[5] HS and HM rates, 1ST Class or higher, qualify for Hospital Corpsman endorsement with at least 1 month service in a military hospital or U.S. Public Health Service hospital (time at sea not required); must be issued Jr. Asst. Purser for this endorsement.

SUGGESTED SEA SERVICE BY RATING

PERCENTAGE OF SEA SERVICE USED FOR LICENSE AND UNLICENSED SERVICE

NAVY AND COAST GUARD RATINGS and THEIR EQUIVALENCIES	Deck 100%	Deck 50%	QMED 100%	QMED[6]	Purser 100%	Purser[7]	Purser 50%	Jr.Asst. Purser
Opticalman (OM)								
Machinery Repairman (MR)			XXX					
Machinist's Mate (MM)			XXX					
Marine Science Technician (MST)								
Master-at-Arms (MA)								
Mess Management Specialist (MS)						XXX		
Mineman (MN)								
Missile Technician (MT)								
Molder (ML)								
Musician (MU)								
Navy Counselor (NC)								
Ocean Systems Technician (OT)								
Operations Specialist (OS)	XXX							
Opticalman (OM)								
Patternmaker (PM)								
Personnelman (PN)								
Photographer's Mate (PH)								
Port Securityman (PS)								
Postal Clerk (PC)								
Public Affairs Specialist (PA)								
Quartermaster (QM)	XXX							
Radarman (RD)	XXX							
Radioman (RM)								
Religious Program Specialist (RP)							XXX	
Ship's Serviceman (SH)								
Signalman (SM)	XXX							
Sonar Technician (ST) (STS)								
Steelworker (SW)					XXX			
Storekeeper (SK)						XXX		
Subsistence Specialist (SS)				XXX				
Telephone Technician (TT)								
Torpedoman's Mate (TM)								
Utilitiesman (UT)								
Weapons Technician (WT)								
Yeoman (YN)								

1 S T R U L E: CALCULATE 60% OF QUALIFYING TIME
T H E N APPLY ADDITIONAL % AS SHOWN ABOVE

---

[6] QMED 100% only for standing engineroom watches: watchstanding must be documented.

[7] Purser 100%: must be a PO1 through MCPO, OR, PO2 for 5 years in supervising and ordering.

Appendix O

MERCHANT MARINE RESERVE STATUS/PROGRESS REPORT

MMR, USNR

MMR
STATUS / PROGRESS REPORT

MMR, USNR

READINESS

OCTOBER 1993

	P	T	R
MMROCH 0102	100	89	1
MMROCH 0206	100	89	1
MMROCH 0310	80	84	2
MMROCH 0420	80	86	1

- CHALLENGE TO TRAIN CROSS ASSIGNED IN

EDUCATION

California Maritime Academy	276	9%
Calhoun Marine Engineering school	81	3%
Great Lakes Maritime School	26	1%
Marine Maritime Academy	217	7%
Massachusetts Maritime Academy	244	8%
New York Maritime Academy	289	10%
Texas Maritime Academy	131	4%
U. S. Merchant Marine Academy	1532	50%
Other	280	10%

EMPLOYMENT

Afloat	1090	35%
Ashore Maritime	221	7%
Ashore Non-Maritime	812	26%
Unknown/Unemployed	953	31%
	3076 (See NOTE)	

AS OF: OCTOBER 1993

NOTE:
Data obtained from the Naval Reserve Merchant Marine Program Office, during September 1995, confirmed that the number of Naval Reservists has remained approximately 3000 during the period between October 1993 and September 1995.

MMR EMPLOYMENT STATISTICS

TOTAL OFFICERS: 3076

ANNUAL REPORTS:

NEW OFFICERS	=	237	= 8%
1993	=	1287	= 42%
1992	=	294	= 10%
NEW/TWO YEARS	=	1818	= 59%

****

EMPLOYED AFLOAT/ALL OFFICERS: 1189/3076 = 39%

EMPLOYED AFLOAT/DECK LICENSE: 643/1496 = 43%

EMPLOYED AFLOAT/ENG LICENSE: 391/1456 = 27%

EMPLOYED AFLOAT/DUAL LICENSE: 48/112 = 43%

EMPLOYED AFLOAT/RADIO LICENSE: 7/10 = 70%

****

EMPLOYED AFLOAT/MASTERS: 130/200 = 65%

EMPLOYED AFLOAT/FIRST MATE: 113/150 = 75%

EMPLOYED AFLOAT/SECOND MATE: 184/240 = 77%

EMPLOYED AFLOAT/THIRD MATE: 265/1017 = 26%

****

EMPLOYED AFLOAT/CHIEF ENGR: 52/75 = 68%

EMPLOYED AFLOAT/FIRST ASST: 83/104 = 80%

EMPLOYED AFLOAT/SECOND ASST: 124/162 = 76%

EMPLOYED AFLOAT/THIRD ASST: 181/1221 = 15%

AS OF: OCTOBER 1993

MERCHANT MARINE PROGRAM BY RANK, DESIGNATOR & LICENSE

DESIG & RANK	MASTER	CHIEF MATE	2ND MATE	3RD MATE	CHIEF ENGINEER	1ST ASST ENGINEER	2ND ASST ENGINEER	3RD ASST ENGINEER	RADIO OFFICER	TOTALS
1625										
CAPT	22	0	0	0						22
CDR	57	7	3	5						72
LCDR	52	19	11	14						96
LT	57	112	165	351						685
LTJG	2	8	51	300						361
ENS	0	2	2	255						259
1675										
CAPT					5	1	0	0		6
CDR					13	5	1	1		20
LCDR					19	16	7	8		50
LT					32	64	98	516		713
LTJG					1	6	38	353		398
ENS					0	2	9	255		268
1665										
CAPT	0	0	0	0	0	0	0	0		0
CDR	3	0	0	2	2	0	0	3		5
LCDR	3	0	1	1	1	0	1	3		5
LT	4	2	4	51	1	9	7	44		61
LTJG	0	0	3	27	1	1	1	27		30
ENS	0	0	0	11	0	0	0	11		11
1695										
CAPT									2	2
CDR									0	0
LCDR									3	3
LT									2	2
LTJG									1	1
ENS									2	2
TOTALS	200	150	240	1017	75	104	162	1221	10	3072

RANK	NUMBER	PERCENT	***	LICENSE LEVEL	NUMBER	PERCENT	***	DESIG	NUMBER	PERCENT
CAPT	30	1%	***	MASTER/CHENG	275	9%	***	DECK	1495	49%
CDR	97	3%	***	FIRST	254	8%	***	ENG	1455	47%
LCDR	154	5%	***	SECOND	402	13%	***	DUAL	112	4%
LT	1461	48%	***	THIRD	2238	72%	***	RADIO	10	0%
LTJG	790	26%	***				***			
ENS	540	18%	***				***			

AS OF: OCTOBER 1993

MMR STATISTICS

	1625	1665	1675	1695	TOT
SELRES	32	0	24	0	56
IRR	1484	111	1435	9	3039
S-1	8	1	8	0	17
S-2	168	16	183	0	367
	1692	112	1483	192	3479

****

MMIRRG (IRR & S-1)	1492	112	1443	9	3056

****

MARITIME ACADEMY GRADUATES NOT IN MERCHANT MARINE RESERVE

	CAPT	CDR	LCDR	LT	LTJG	ENS	TOT
1105 SELRES	7	34	125	81	0	0	247
1105 IRR	12	30	47	108	14	1	212
1105 S-1	0	0	1	0	0	0	1
1105 S-2	1	16	51	340	19	1	428
OTHER DESIG	8	26	55	118	18	10	235
	28	106	279	647	51	12	1123

****

1105 ONLY	20	80	224	529	33	2	888

****

AS OF: AUGUST 1993