The Effective U.S. Controlled Shipping Fleet: Historical and Projected Decline in Relation to U.S. Strategic Tanker Sealift Resources

by

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ABSTRACT

The U.S. military relies upon four primary sources of strategic sealift tankers in moving military fuels to theaters of war. These sources include the tankers of the Military Sealift Command, the Ready Reserve Force, the U.S. flag fleet, and the Effective U.S. Control (EUSC) fleet. The latter two sources can be called upon following the declaration of a state of national emergency by the President. The EUSC fleet consists of vessels owned by U.S. corporations that operate under the foreign flags of Panama, Honduras, Liberia, the Bahamas, and the Marshall Islands. While the U.S. flag vessels would be called upon initially, the EUSC fleet represents a significant source of tanker tonnage when U.S. flag vessels are exhausted. However, the EUSC fleet has been in a state of decline since the late 1970's in response to unfavorable U.S. tax laws, versus the tax laws of other maritime nations, regarding shipping income earned by U.S. companies through foreign subsidiaries.

This study investigates the historical decline of the EUSC tanker fleet and provides a forecast of the size of this fleet through the start of 2016. Analyses are performed to determine the ability of the fleet to deliver fuels to theaters of war under pending non-double hulled tanker phase out requirements and under various distances to theater. Throughout the study, the total tanker sealift resources available to U.S. military planners are noted, and the significance of the EUSC fleet's contribution to this pool of tankers is emphasized. Potential shortfalls in total tanker resources for military purposes are identified as early as the start of 2006. Recommendations for rebuilding the EUSC fleet and improving its military potential over the long term are provided. In addition, a near term solution to potential shortfalls in tanker tonnage is provided that calls for the use of EUSC tankers currently not considered militarily useful by the Joint Chiefs of Staff.

Thesis Supervisor: Henry S. Marcus
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CHAPTER 1

INTRODUCTION

The strategic sealift plans of the United States military rely on a variety of sources to meet the predicted requirements for marine vessels during military emergencies. The U.S. military's initial source of strategic sealift vessels comes from vessels owned or on long-term charter by the Military Sealift Command. These vessels are maintained in a constant state of readiness and serve actively in support of the U.S. military. As additional vessels are required to meet military sealift needs, the Ready Reserve Force (RRF), which is maintained by MARAD, would be activated if U.S. flag or foreign flag ships were not available for charter. Following the commitment of both the MSC vessels and the RRF, the U.S. government could declare a national military emergency and either begin the reactivation of the National Defense Reserve Fleet (NDRF) or authorize the acquisition of U.S. flag merchant ships and/or certain foreign flag vessels that are majority owned by U.S. citizens. The latter category of ships is referred to as the Effective U.S. Control fleet or the EUSC fleet. Throughout this study it should be noted that U.S. flag vessels take precedence over EUSC vessels as long as U.S. flag vessels are available.

The Effective United States Control (EUSC) Fleet is comprised of merchant vessels, registered in Liberia, Panama, Honduras, the Bahamas, and the Marshall Islands, that are owned and operated (often through foreign subsidiaries) by American companies in

international shipping, and which are available for requisition, use, or charter by the U.S. in the event of war or national emergency. Tankers represent the predominant type of vessel in the EUSC fleet.

The purpose of this research is to investigate the history and expected future of the EUSC fleet, especially the growth, decline, and military relevance of the tanker portion of this fleet. The presumed historical and future decline in the size of this fleet since the late 1970's was the impetus for this study. It is also presumed that current U.S. tax laws regarding shipping income from foreign subsidiaries of U.S. parent corporations are the primary cause of this decline. A principal concern is that the continued decline in both the U.S. flag and the EUSC fleets will result in a shortage of reliable tanker tonnage for U.S. military planners.

The first part of this report presents the size of the EUSC fleet from 1970 through 2001 utilizing publicly available sources of information. This portion also provides the Department of Defense's definition of a "military useful" tanker that will be applied throughout the remainder of the study. In addition, a legal history is included that provides some insight into the causes of the growth and decline over these three decades. The second section of this report contains an investigation of the projected future of the EUSC fleet through the start of 2016 based upon the pending application of double hulled tanker legislation and the current trends in the EUSC fleet. A comparison of this study's projected supply of sealift tankers to the projections of the most recent unclassified DoD study is a major emphasis. The final section of this study presents an option for

increasing the number of EUSC sealift tankers available in the future by expanding the definition of a militarily useful tanker.

ORGANIZATION BY CHAPTER

Chapter 2 provides the history of the U.S. owned, foreign flag fleet and the EUSC fleet using publicly available information. The EUSC fleet is a subset of the U.S. owned, foreign flag fleet and is differentiated by the possession of certain flags of convenience on its vessels. This chapter examines the historical size of both fleets, including their tanker fleet subsets, for 1970 through 2000. Although not the emphasis of this report, the strategic tanker sealift contributions of the Military Sealift Command, National Defense Reserve Fleet, Ready Reserve Fleet, and U.S. flag fleet are also discussed. An important aspect of this chapter is the introduction of the most recent Joint Chiefs of Staff definition of a militarily useful tanker. Using this definition, the size of the primary fleet of militarily useful tankers available to U.S. military planners in 2001 is identified and compared to a GAO report on the size of this fleet in 1990.

Chapter 3 provides the legal history of U.S. tax laws related to shipping income earned by U.S. corporations from foreign subsidiaries, which is the typical manner in which U.S. owned vessels are operated under flags of convenience. The text of this chapter is sourced from a report that considers the effect of U.S. tax laws on the EUSC fleet and the possible methods of reversing its decline. This information is cited in this study in order

to provide some explanation for the growth and decline of the EUSC fleet over the previous three decades.

In Chapter 4, a brief literature review is provided that supports the need for the EUSC fleet in the context of providing a source of tanker sealift vessels. The text in this chapter is an excerpt from the same report cited in Chapter 3.

The current size and future capabilities of the militarily useful, EUSC fleet are the topics of Chapter 5. In this chapter, a variety of analyses are performed to estimate the size and capacity, in terms of delivery to a theater of war, of the militarily useful, EUSC fleet for June 2002 through the start of 2016. Both Oil Pollution Act of 1990 and MARPOL 13/G (Revised) regulations concerning the phase out of non-double hulled tankers are considered. A baseline analysis considers the deliverable capacity of the fleet for a distance to theater of 3000 nautical miles. Other analyses demonstrate the effect of varying the distance to theater and of introducing replacement tonnage after 2002. In addition, the OPA 90 regulations and the current trends in the Jones Act tanker trades are considered in developing projections of the size of the U.S. flag tanker fleet for the start of 2006, 2011, and 2016. The final section of this chapter compares the total number of militarily useful tankers projected to be available for the start of 2006 to the projected requirements contained in the unclassified version of the MRS-05 Tanker Sealift Analysis report, which is the most recent publicly available study of the strategic tanker sealift needs of U.S. military planners.

A short term solution to the potential tanker shortages identified in Chapter 5 is presented in Chapter 6. When the U.S. military runs out of suitable tankers, it is forced to turn to the vessels of NATO members and other allies or to chartering foreign flag vessels owned by non-U.S. companies. An alternative to this approach is to expand the definition of militarily useful to include EUSC tankers of sizes over 100,000 dwt. The suitability and potential uses of larger EUSC tankers is the major emphasis of this chapter. The use of larger tankers is analyzed in the context of the number of Handysized, foreign owned tankers that can be replaced by the use of a single Aframax, Suezmax, or VLCC tanker.

CHAPTER 2

PUBLICLY AVAILABLE INFORMATION ON THE EUSC FLEET AND RELATED SEALIFT RESOURCES

As the MRS-05 Sealift Tanker Analysis confirms, the adequate transport of petroleum, oil, and lubricants (POLs) to a military theater is critical to the highly fuel dependent operational requirements of the Department of Defense (DoD). Therefore, one of the most important categories of military sealift vessels is tankers, a category in which the EUSC fleet traditionally has been strong. In this chapter, historical and current information on the EUSC fleet as a source of military sealift tankers will be summarized. In addition, a comparison of the total strategic sealift resources available to U.S. military planners will be presented.

U.S. OWNED, FOREIGN FLAG FLEET

It is important to differentiate between U.S. owned vessels registered in foreign countries generally and those U.S. owned, foreign flag vessels in the EUSC fleet. The latter is a subset of the former, and in terms of military sealift planning has, as will be explained herein, much greater significance.

It has been a common practice, dating back to the Nineteenth Century, for American shipowning companies to own and operate vessels under various registries for a variety of reasons: lower construction and operating costs, lower tax (certainly so in earlier

years), very attractive subsidies, marketing or natural resource extraction opportunities, national flag requirements, neutrality in time of war, etc. Particularly in earlier years, the size of the overall U. S. owned, foreign flag fleet was indeed substantial. For instance, if the U.S. owned segment of foreign flag tonnage in 1900 was deemed to be a fleet all by itself, compared to other national flag fleets it would have ranked as the fourth largest fleet in the world.

In the early years of the Twentieth Century, the European registries accounted for most of the American owned tonnage registered abroad. However, in the 1920s and increasingly so in the 1930s American shipowners registered vessels in Panama and, to a much lesser extent, Honduras. These registries, along with more recent additions, are sometimes referred to pejoratively as "flags of convenience," although the phrase "open registries" (a United Nations creation) is more commonly accepted today. As distinguished from the so-called "traditional registries" of the United States, Europe, Japan, etc., the open registries offer shipowners of other nations no restrictive shipowning nationality requirements, no national restrictions on shipbuilding or repair, no limitations on crew nationalities, less restrictive manning requirements, and more favorable tax structures. Today, open registries still account for a significant percentage of the world's merchant tonnage. U.S. shipowning companies were once the predominant nationality among owners of open registry tonnage but their share has declined sharply in more recent years. On the other hand, American shipowners, ever since the onset of World War II, have continued to favor open registries over other traditional foreign registries as well as the

"second registries" some European nations have adopted to be more competitive with open registries.

Nevertheless, there are currently a small number of vessels owned by U.S. shipowning companies and registered in several foreign nations other than Liberia, Panama, Honduras, the Bahamas and the Marshall Islands. Notably, under U.S. law (Section 902 of the Merchant Marine Act of 1936, as amended in 1939) these vessels would be subject to requisition, use or charter by the United States in the event of a national emergency. However, they cannot be deemed to be under Effective U.S. Control because they do not meet the considerations established by the Joint Chiefs of Staff following World War II, one of which is that the nation of registry must be "...willing and able to bring the vessel under control of the United States in an emergency for such use as the United States may wish to make of the vessel..." (J.L.S. 1454/11). From the standpoint of military sealift planning, the problem is that the non-EUSC flag states have not tacitly or explicitly consented in advance to making the U.S. owned ships flying their flags available in such manner because they may want the vessels to meet their own sealift needs, or because of political, sovereignty or neutrality considerations, etc. Thus, reliance on non-EUSC vessels to meet U.S. emergency sealift needs would be, at best, problematic. The problem is compounded by the rule of international law that clearly recognizes the paramount rights of the flag states to exercise control over vessels flying their flags.

On the other hand, there is some value in tracing the growth and decline of the overall U.S. owned, foreign flag fleet because there are some clearly discernible parallels with

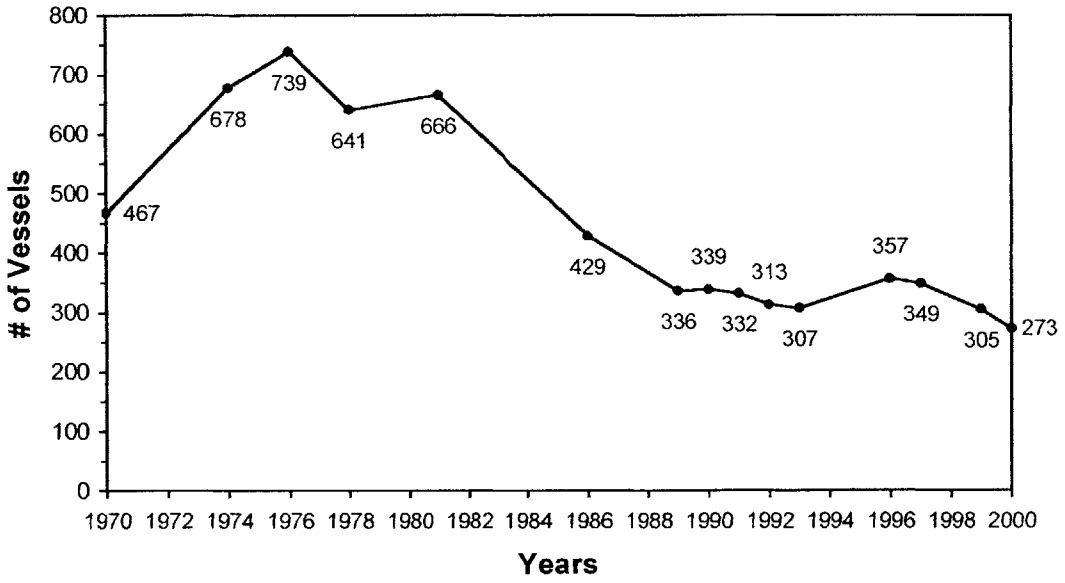
the growth and decline of its subset, the EUSC fleet. In considering these parallels it should be kept in mind that the overall U.S. owned, foreign flag fleet has been generally impacted by the 1975 and 1986 changes in U.S. tax laws to the same extent as the EUSC fleet.

The historic trends of both the U.S. owned, foreign flag and the EUSC fleets will be traced from 1970 to 2000. This period covers the growth of these fleets to their historic peaks and their subsequent decline through the year 2000 in terms of deadweight tonnage (dwt). Data for earlier years was intermittent and deemed less important with regard to the impact of the changes in U.S. tax laws in 1975 and 1986. However, it is useful to first consider the importance placed upon obtaining access to sealift vessels by military planners in the wake of World War II. The Merchant Vessel Register was a quarterly report compiled by the Merchant Vessel Section of Naval Transportation Service in the Office of the Chief of Naval Operations that tracked the inventory of U.S. controlled merchant vessels. This publication monitored government owned and privately owned vessels, including both the U.S. flag and the effectively controlled foreign flag fleets. The June 30, 1949, Register reports that the modern EUSC fleet contained 202 vessels with a combined dwt of 2,476,500, which included 140 tankers consisting of 2,063,900 dwt. Even in an era where the U.S. flag fleet of 1202 vessels dwarfed the EUSC fleet, the EUSC tankers still accounted for 22 percent of America's tanker sealift planning by dwt. In the years after 1949, the size of the U.S. owned, foreign flag fleet grew rapidly until the mid-1970's. Since its peak, this fleet has experienced a substantial decline while the total world fleet has continued to grow. It will be demonstrated in the remainder of this

chapter that the current significance of the contribution of the EUSC tanker fleet to America's sealift planning has increased despite its present state of decline.

The historic trends of the U.S. owned, foreign flag fleet in terms of number of vessels and of dwt since 1970 are contained in Figure 2.1 and Figure 2.2 respectively. From these graphs, it is apparent that the total number of vessels in the overall U.S. owned, foreign flag fleet peaked in approximately 1976 and has been in decline since that year. The sharpest period of decline in terms of total numbers occurred between 1981 and 1989. In terms of dwt, the total fleet size declined by 72 percent between 1981 and 2000. Between 1986 and 2000, the total dwt declined by 53 percent. The MARAD database of the U.S. owned, foreign flag fleet for April 2000, the last year for which a complete MARAD database of the U.S. owned, foreign flag fleet is available, is contained in Appendix A.

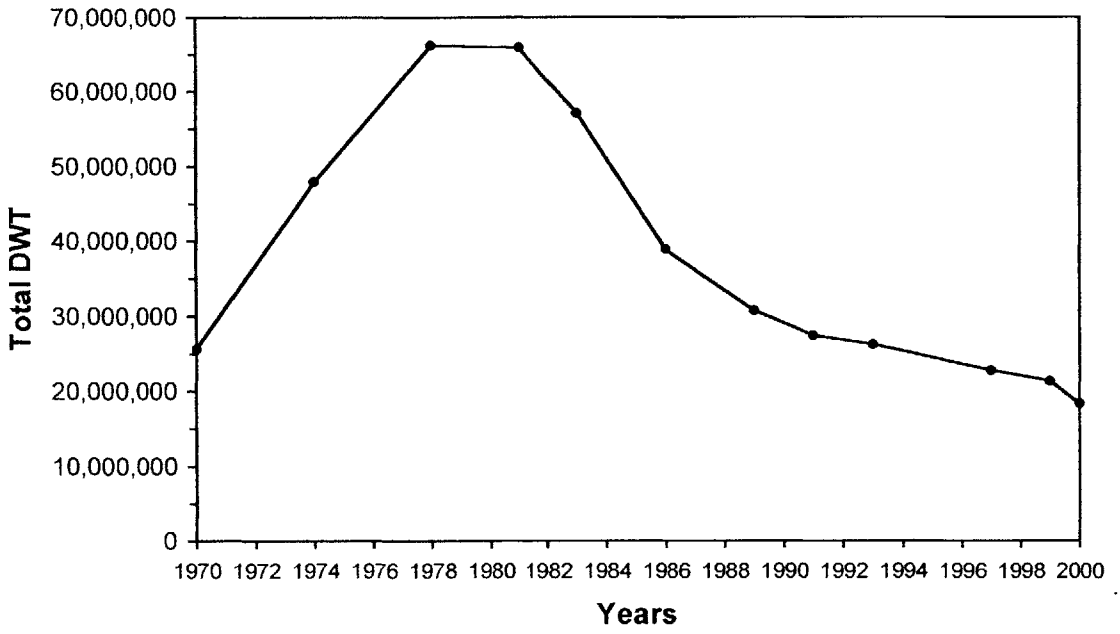
The composition of the U.S. owned, foreign flag fleet includes container vessels, breakbulk vessels, passenger vessels, bulk carriers, and tankers. The largest segment of this fleet is the tanker portion, which accounted for 82 percent of the total dwt of the fleet in 2000. The trend in tanker ownership by U.S. companies has followed the historic pattern of the combined U.S. owned, foreign flag fleet. Figure 2.3 displays the total number and total dwt of tankers within this fleet from 1970 to 2000. In 2000, there were a total of 130 tankers. The dwt of this subset of the U.S. owned, foreign flag fleet dropped by 56 percent between 1986 and 2000.



Source: 1) Marcus, Henry et. al., "U.S. Owned Merchant Fleet: The Last Wake-Up Call?", M.I.T., 1991.
2) Dean, Warren L. and Michael G. Roberts, "Shipping Income Reform Act of 1999: Background Materials Regarding Proposal to Revitalize the U.S. Controlled Fleet Through Increased Investment in International Shipping." Thomas Coburn LLP, 1999.
3) U.S. Owned, Foreign Flag Fleet Database, MARAD, January 1997.
4) U.S. Owned, Foreign Flag Fleet Database, MARAD, July 1999.
5) U.S. Owned, Foreign Flag Fleet Database, MARAD, April 2000.

Figure 2.1, Historical U.S. Owned, Foreign Flag Fleet - # of Vessels

The long term decline of the U.S. owned, foreign flag fleet reflects the selling or scrapping of vessels by their owners. It is apparent that vessels were removed from this fleet at a faster pace than owners sought to replace those ships. Figure 2.4 presents the average age of the vessels comprising the U.S. owned foreign flag fleet from 1978 to 2000. The graph reveals a steady increase in the average age of the fleet between 1978 and mid-1996, which reflects the tendency of U.S. owners to avoid replacing ageing vessels after 1978. Since 1996, the average age has stabilized at about 15 years.



Source: 1) Marcus, Henry et. al., "U.S. Owned Merchant Fleet: The Last Wake-Up Call?", M.I.T., 1991.
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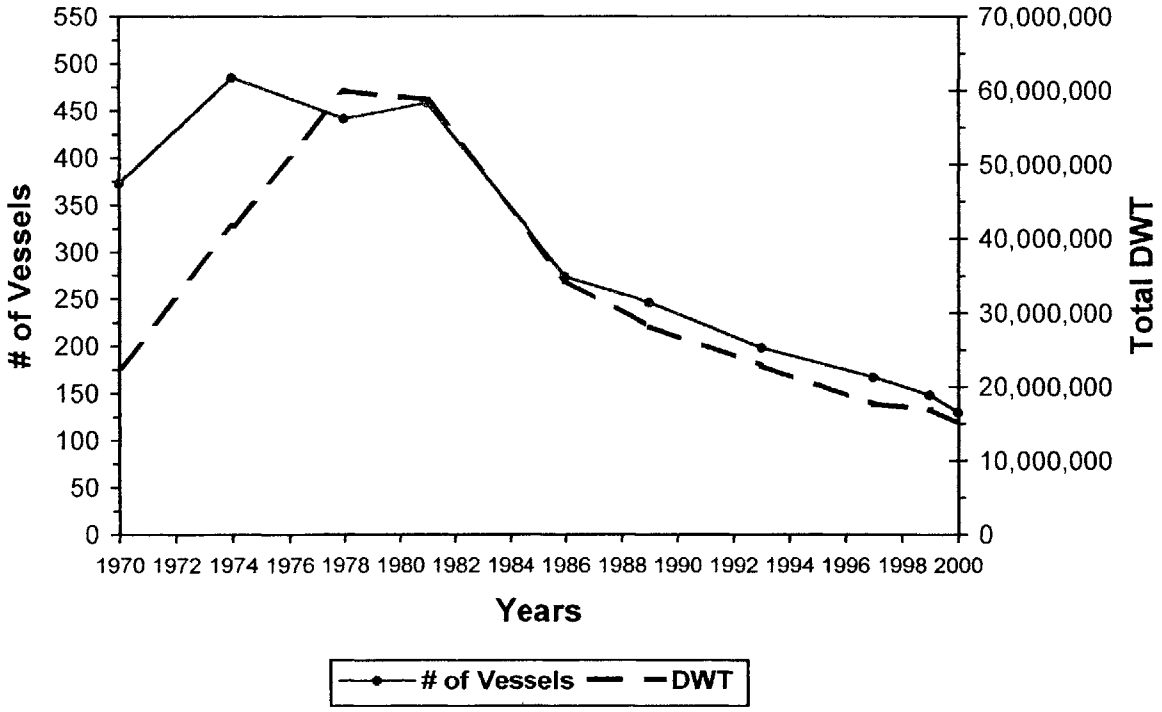
4) U.S. Owned, Foreign Flag Fleet Database, MARAD, July 1999.
5) U.S. Owned, Foreign Flag Fleet Database, MARAD, April 2000.

Figure 2.2, Historical U.S. Owned, Foreign Flag Fleet – Total DWT of Fleet

An additional measure of the decline of the U.S. owned, foreign flag fleet is the decrease in the number of U.S. companies participating in this industry. The total number of U.S. companies that owned foreign flag vessels in 1987, 1990, 1993, 1997, 1999, and 2000 is presented in Table 2.1. In 2000, seventeen American parent companies owned foreign flag tankers.



Source: 1) Marcus, Henry et. al., "U.S. Owned Merchant Fleet: The Last Wake-Up Call?", M.I.T., 1991.
2) Waters, Robert C. and Philip C. Koenig, "Decline of the U.S. Owned, Foreign Flag Merchant Fleet." 36th Annual Forum, Transportation Research Forum, 1994.
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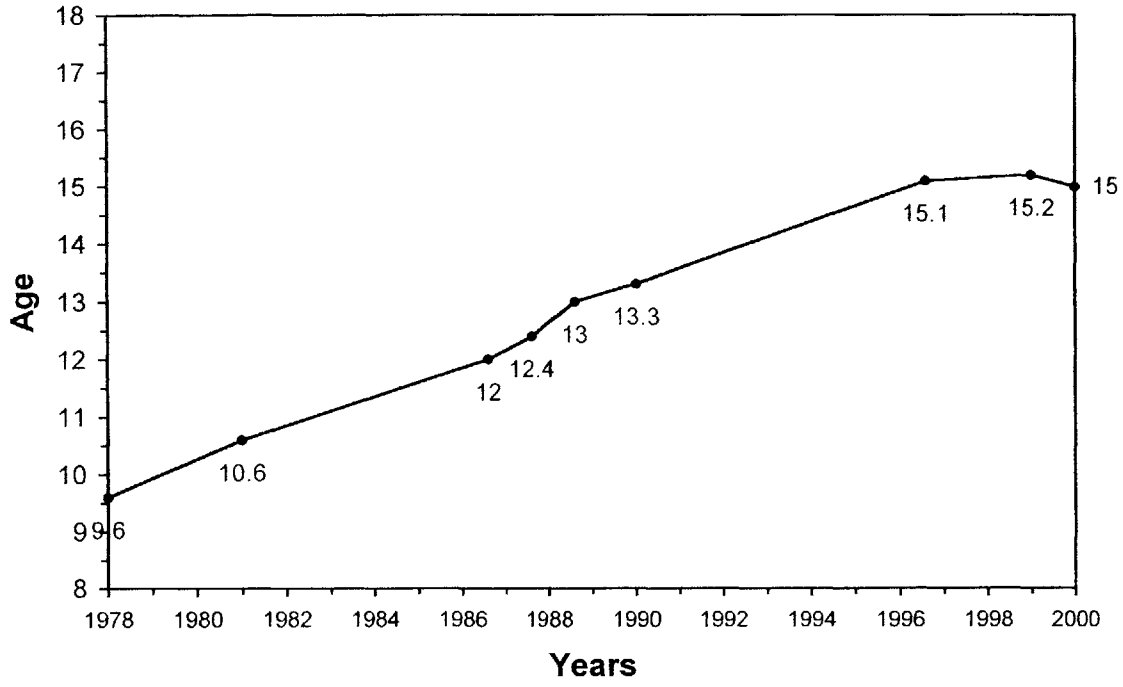
4) U.S. Owned, Foreign Flag Fleet Database, MARAD, July 1999.
5) U.S. Owned, Foreign Flag Fleet Database, MARAD, April 2000.

Figure 2.3, Historical U.S. Owned, Foreign Flag Tankers – # of Vessels & Total DWT



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2) U.S. Owned, Foreign Flag Fleet Database, MARAD, July 1999.
3) U.S. Owned, Foreign Flag Fleet Database, MARAD, April 2000.

Figure 2.4, Historical U.S. Owned, Foreign Flag Fleet – Average Age

	Years					
# of U.S. Companies w/ Foreign Flag Vessels	1987	1990	1993	1997	1999	2000
	52	43	38	48	39	35

Source: 1) Waters, Robert C. and Philip C. Koenig, "Decline of the U.S. Owned, Foreign Flag Merchant Fleet." 36th Annual Forum, Transportation Research Forum, 1994.
2) U.S. General Accounting Office, Tax Policy: "Uncertain Impact of Repealing the Deferral for Reinvested Shipping Income", (GAO/GGD-90-35), Washington, D.C., 1990.
3) U.S. Owned, Foreign Flag Fleet Database, MARAD, January 1997.
4) U.S. Owned, Foreign Flag Fleet Database, MARAD, July 1999.
5) U.S. Owned, Foreign Flag Fleet Database, MARAD, April 2000.

Table 2.1, Number of U.S. Owners of Foreign Flag Vessels

EFFECTIVE U.S. CONTROL FLEET

A. Historical Perspective

Effective U.S. Control is a long standing policy formulated by the Joint Chiefs of Staff that has its roots in the years leading up to and during the World War II. In essence, it provides that U.S. owned vessels registered under the laws of certain open registries can be deemed to be under the effective control of the United States for use in time of national emergency. It is noteworthy that not all open registries (e.g., Cyprus, Malta, Vanuatu, St. Vincent, etc.) have been deemed to be eligible EUSC registries, but that the five eligible open registries have all come into being with the strong support of American shipowning interests and, in most cases, the indirect support of the U.S. government.

The formulation of EUSC policy and the growth of open registries have run on parallel courses. Panama created the first open registry in the early years of the 1920s when two former German flag passenger vessels, having been transferred to the U.S. flag as war reparations, were transferred by Harriman Lines to the Panamanian registry in order to avoid the prohibition against sale of alcohol on U.S. flag vessels under the Volstead Act. In the years that followed another open registry came into being when the United Fruit Company began to register its ships in Honduras. The Panamanian fleet experienced a growth spurt during the mid-1930s when the Standard Oil Company of N.J. transferred its fleet of 25 tankers flying the flag of the Free City of Danzig to Panama in order to assure that the ships did not fall under Nazi control.

As originally enacted, the emergency requisitioning and use authority under Section 902 of the Merchant Marine Act of 1936 applied only to U.S. flag vessels. In the spring of 1939, however, as the likelihood of war in Europe and the Far East became increasingly apparent, Rear Admiral Emory S. Land, Chairman of the United States Maritime Commission and the official responsible for marshalling the nation's sealift assets during World II, appeared before Congress to urge enactment of certain amendments to Section 902 that the Navy and the Maritime Commission believed were "desirable, in the interest of our national defense." He told Congress that "...The power to requisition or purchase should not be confined to vessels 'documented under the laws of the United States,' because many vessels owned by our citizens are now under foreign registry. Accordingly, the authority to requisition or purchase should extend to all vessels or watercraft owned by citizens of the United States." (Hearings on H.R. 4983 Before the House Committee on Merchant Marine and Fisheries, 76th Cong., 1st Sess. (1939), p. 9) (Emphasis added.) The House Report on Section 902 repeated verbatium this portion of his testimony. The amended Section 902 was enacted into law three weeks prior to the Nazi invasion of Poland.

When the war began, the Neutrality Act of 1939 prohibited U.S. flag vessels from trading with belligerents. This caused the Roosevelt Administration, seeking to ship oil and other essential supplies to Great Britain and France, to encourage the transfers of 70 U.S. flag ships to Panama and Honduras. In 1941, before the United States entered the war, the Maritime Commission requisitioned (under a statute passed earlier that year) 40 Danish flag vessels in U.S. ports and then arranged for the transfer to Panama of 30 of the

vessels, which were then operated by U.S. shipping companies. During 1941 and 1942 the Maritime Commission also arranged for the transfer of 47 other European owned vessels (primarily Italian and Finnish) it had seized in U.S. waters. Various other European flag vessels, including Norwegian and Greek ships, were transferred to Panama by their owners in order to assure that authorities controlled by the Germans would have no legal claim over them. Throughout the war the Panamanian and Honduran flag ships sailed alongside U.S. flag ships and other allied vessels, suffering many losses in the process. For instance, the ESSO tanker fleet flying the Panamanian flag lost 20 ships to enemy action, while the United Fruit Company fleet lost 17 ships. By May of 1944 the War Shipping Administration controlled a total of 127 Panamanian flag ships, including 61 owned and under charter from American companies and 66 either confiscated or requisitioned by the United States and operated for the most part by American companies.

It was during the war that the term "effective control" was adopted by the War Shipping Administration to differentiate between U.S. flag ships and those under foreign flags, principally Panamanian. In 1945 the Joint Chiefs of Staff considered the role of merchant shipping from the standpoint of national defense and concluded that "to be effective as an instrument of national defense U.S. merchant shipping should be under U.S. flag or effective U.S. control...." It further stated that "the term 'effective United States control' as applied to shipping is considered to include all shipping which can be expected to be available for requisition by the United States Government in time of

national emergency even though such shipping may not be under the United States flag..." (J.C.S. 1454/1).

In 1947 the Joint Chiefs of Staff clarified its earlier definition, apparently seeking to resolve the problem of those flag states that would not consent to the use of the vessels in their registries by the United States, as follows:

> "The term 'effective United States control' as used [in J.C.S. 1454/1] appears to be inadequately defined. On a number of occasions doubt as to the meaning of the term has arisen. Except through agreement there are no legal means by which the United States can regain control of a United States merchant vessel the registry of which as been transferred to another country. From a legal standpoint therefore it can be considered that the only time a vessel is under absolute 'effective United States control' is when it flies the United States flag.
>
> Actually, however, there are certain countries in this hemisphere which through diplomatic or other arrangements will permit the transfer to their registry of United States ships owned by United States citizens or United States corporations and allow these citizens or corporations to retain control of these vessels. Prior to entry of the United States into World War II, United States vessels were transferred to Panamanian registry for the purpose of rendering aid to the allies. Such a case as the above can be considered to be within the meaning of the term 'effective United States control.'
>
> When the foreign authorities who are in a position to dictate to the owner, master, crew, charterer or other individual or agency having physical control of the vessel are willing and able to bring the vessel under control of the United States in an emergency for such use as the United States may wish to make of the vessel, such vessel may also be considered to be under 'effective United States control.' It can be concluded, therefore, that the

primary considerations in determining whether or not a United States merchant ship would still be under 'effective United States control' are:

a. The practice followed in the past in regard to transfer of United States merchant vessels to foreign registry.
b. The status of diplomatic relations between the United States and the foreign country concerned.
c. Its relations with countries opposed to our system of government or foreign policy.
d. Proximity of the foreign country to the United States.
e. The stability of its government." (J.C.S. 1454/11)

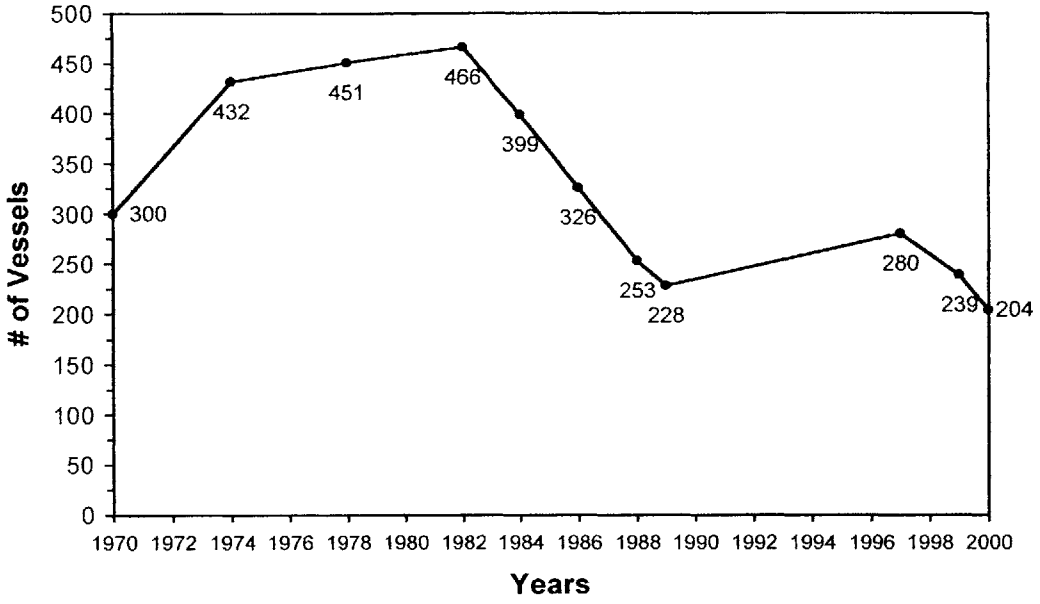
World War II had introduced many U.S. shipping companies to open registries. Following the war the Merchant Ship Sales Act of 1946 enabled the companies to acquire tankers and dry cargo vessels built during the war and transfer them to foreign registry. This growth spurt caused American shipowners to seek out another open registry more to their liking. In 1948, while preparations for a new Liberian registry were underway, the Joint Chiefs of Staff approved the status of Liberia as an EUSC registry, conditioned on the agreement by the Liberian government and shipowners that vessels would be returned to the United States in time of emergency.

For more than three decades the so-called PANLIBHON registries constituted the three eligible EUSC registries. However, in the early 1980s in the wake of political turmoil in Liberia, American shipowners undertook the search for another desirable open registry, an effort that resulted in the modernization of the almost moribund Bahamian registry, which was recognized as an eligible EUSC registry in 1983. In 1990, again with the

support of American shipping companies, the Marshall Islands also was recognized as an eligible registry.

B. Growth and Decline

Not surprisingly, the growth and decline of the EUSC fleet over the past three decades is similar to the historical pattern of the overall U.S. owned, foreign flag fleet. In addition, the patterns of an increase in average age and of a decrease in the numbers of participating U.S. companies for the U.S. owned foreign flag fleet also apply to the EUSC fleet. Figure 2.5 and Figure 2.6 provide the trends for this fleet's size for the period 1970 to 2000 and 1981 to 2000, respectively. From Figure 2.5, a reversal of the decline in the number of EUSC vessels is apparent between 1989 and 1997. This upswing corresponds to a similar trend for this period for the U.S. owned, foreign flag fleet. It is possible that the addition of the Marshall Islands to the list of eligible flag states in 1990 was a cause for this upturn as both U.S. owners using ineligible foreign flags and several U.S. flag owners switched to the Marshall Islands registry. The historical pattern for dwt in the U.S. owned, foreign flag fleet is also included in Figure 2.6. A comparison of the sizes of the EUSC and total U.S. owned, foreign flag fleets reveals that the EUSC fleet encompasses the vast majority of the total fleet, which suggests that references to these fleets have increasingly become synonymous. While the number of EUSC and U.S. owned, foreign flag vessels realized an increase between 1989 and 1997, the total dwt of both fleets has maintained its decline. The number of tankers and total dwt of this portion of the historical EUSC fleets are presented in Figure 2.7. In 2000, the tanker subset comprised 84 percent of the total dwt of the EUSC fleet.



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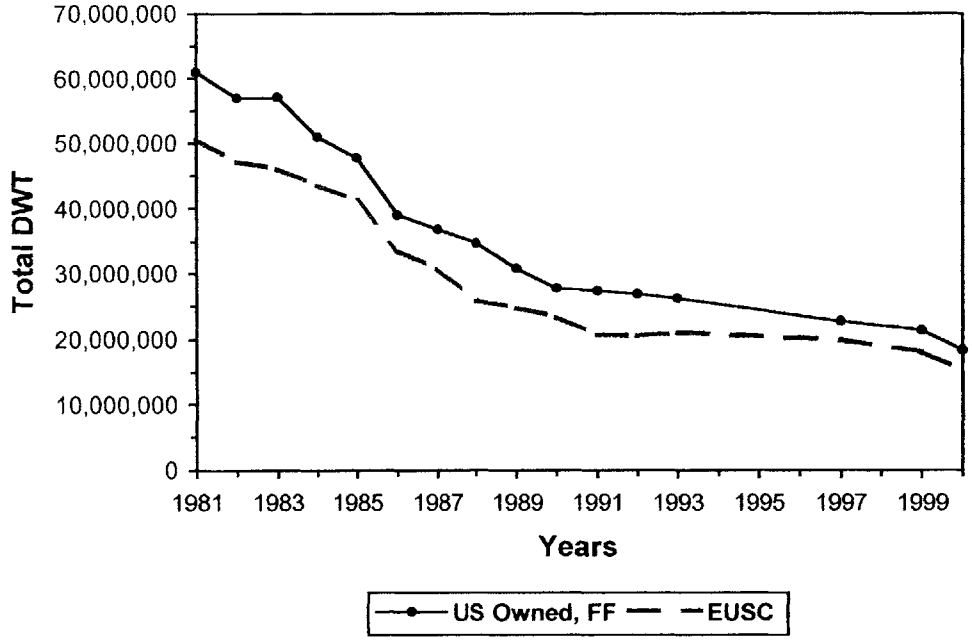
3) U.S. Owned, Foreign Flag Fleet Database, MARAD, July 1999.
4) U.S. Owned, Foreign Flag Fleet Database, MARAD, April 2000.

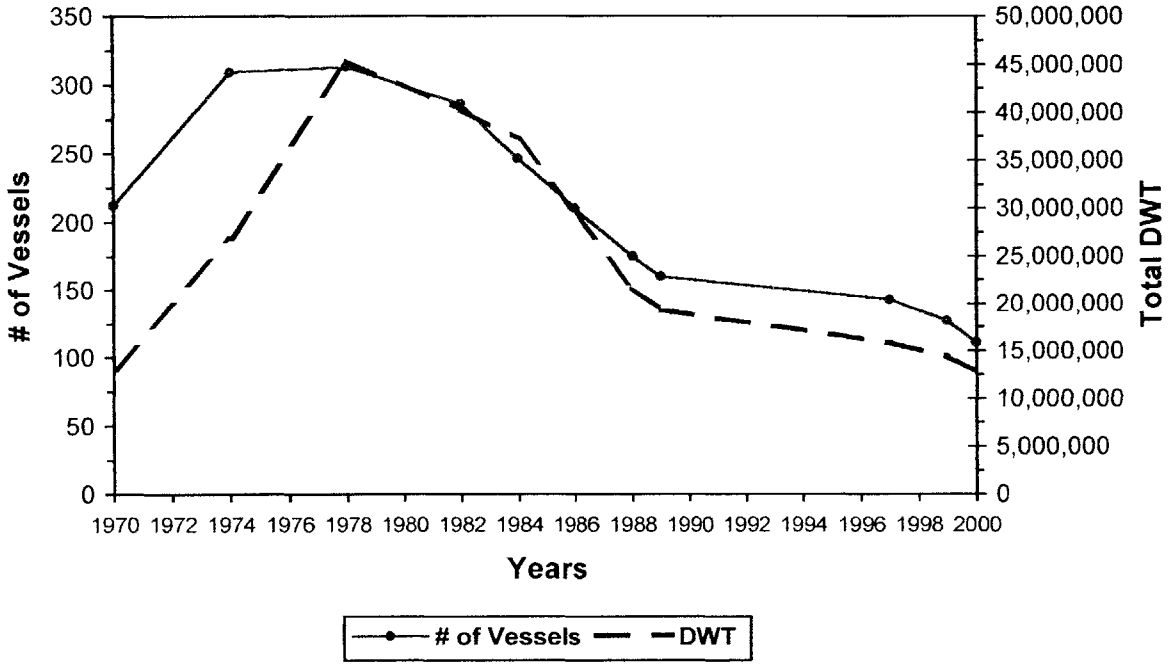
Figure 2.5, Historical EUSC Fleet - # of Vessels



Sources: 1) Waters, Robert C. and Philip C. Koenig, "Decline of the U.S. Owned, Foreign Flag Merchant Fleet." 36th Annual Forum, Transportation Research Forum, 1994.
2) U.S. Owned, Foreign Flag Fleet Database, MARAD, January 1997, July 1999, April 2000.

Figure 2.6, Total DWT of Historical Fleets: U.S. owned, foreign flag and EUSC

On a dwt or carrying capacity basis, the EUSC tanker fleet has experienced a 72 percent decline between 1978 and 2000. For the period 1986 to 2000, the dwt of the tanker portion of the EUSC fleet dropped by 57 percent.



Source: 1) Marcus, Henry et. al., "U.S. Owned Merchant Fleet: The Last Wake-Up Call?", M.I.T., 1991.
2) U.S. Owned, Foreign Flag Fleet Database, MARAD, January 1997.
3) U.S. Owned, Foreign Flag Fleet Database, MARAD, July 1999.
4) U.S. Owned, Foreign Flag Fleet Database, MARAD, April 2000.

Figure 2.7, Historical EUSC Tanker Fleet – # of Vessels & Total DWT

MILITARILY USEFUL EUSC TANKER FLEET

The numbers presented in Figure 2.7 represent the totals for all tanker vessels in the EUSC fleet. In terms of military sealift capabilities, not all of these vessels can be defined as *militarily useful*. The term *militarily useful* has different relevance in regard to dry cargo vessels and bulk liquid carriers. In addition, the Joint Chiefs of Staff has

altered the bulk liquid carrier standard over time. For example, the 1990 tanker standard was identified as:

- ✓ Sized between 6,000 and 100,000 dwt
- ✓ Possessing a beam less than 106-feet
- ✓ Capable of handling petroleum product cargos.[1]

This standard permitted the use of chemical carriers but excluded specialty tankers, such as liquefied natural gas (LNG) carriers.

For the tank vessels of concern in this study, the term refers to bulk liquid carriers, including most types of tankers and integrated tug-barges, that meet the following criteria as defined by the Joint Chiefs of Staff under CJCSI 3110.11B of January 30, 1996:

- ✓ Sized between 2,000 and 100,000 dwt
- ✓ Possess a speed greater than 12 knots.

While chemical carriers are deemed militarily useful, specialized tankers such as liquefied natural gas (LNG) and liquefied petroleum gas (LPG) are still excluded.

Most literature on the subject of the EUSC fleet does not provide information on the historical size for the militarily useful portion of this fleet. As a result of the decline in the total size of the EUSC fleet over recent decades, the remaining militarily useful portion has become an increasing concern for military sealift planners. Two sources provide a limited historical view of the militarily useful tankers within the EUSC fleet. A 1990 Government Accounting Office (GAO) report cited the U.S. Navy as identifying 92

[1] U.S. General Accounting Office, Tax Policy: "Uncertain Impact of Repealing the Deferral for Reinvested Shipping Income", (GAO/GGD-90-35), Washington, D.C., 1990.

militarily useful tankers to be drawn from the EUSC fleet. As of January 2001, the Maritime Administration's (MARAD's) database of militarily useful tankers within the total EUSC fleet identified 63 vessels. The information from these sources indicates a decline of approximately 32 percent in the number of militarily useful tankers in just over a decade. Table 2.2 provides the size and composition of the militarily useful portion of the EUSC tanker fleet as contained in the MARAD database for January 1, 2001. The 2001 MARAD database for the militarily useful EUSC fleet is contained in Appendix B. The average age of this portion of the EUSC fleet was 13.4 years in 2001.

	Characteristics		
Type	#	DWT	Barrels
Product Tanker < 80,000 DWT	28	1,281,928	9,595,005
Product Tanker > 80,000 DWT	7	609,250	4,369,410
Crude Carriers	18	1,642,623	11,702,755
Chemical Tankers	10	210,077	2,875,286
Total	63	3,743,878	18,947,451

Source: Maritime Administration, U.S. Department of Transportation, Militarily Useful, EUSC Tanker Fleet Database, January 2001.

Table 2.2, Size and Composition of the Militarily Useful, EUSC Tanker Fleet (2001)

The militarily useful standard for 1996 will be the baseline applied to all EUSC and U.S. flag tankers throughout this study. There are additional standards that can be applied to the tanker fleets. One additional requirement for modern tankers calls for the vessel to be 25 years or less in age. This condition is appropriate as many refineries and prominent oil companies are refusing to deal with tankers over this age. This standard was included by the military planners in the MRS-05 Sealift Tanker Analysis report. Another requirement, that is appropriate in light of the Oil Pollution Act of 1990 and MARPOL's Resolution 13/G, involves the phasing out of non-double hull tankers. These regulations will be discussed further in Chapter 5. As these regulations take effect, there will be few remaining trade routes where non-double hulled tankers will be permitted to trade.

Therefore, it seems reasonable to expect that these vessels will be scrapped upon reaching their respective phase out dates. Where these requirements are applied in addition to the JSC militarily useful standard, it will be noted.

OTHER SOURCES OF MILITARY SEALIFT TANKERS

There are three other primary sources of strategic sealift vessels available to U.S. military planners in addition to EUSC vessels. These sources include the Military Sealift Command, the National Defense Reserve Fleet, and the privately owned, U.S. flag merchant fleet. In addition, the MSC can charter foreign owned tankers, but these ships are not considered for planning purposes. The past and present sizes of these fleets are summarized in the following sections.

Military Sealift Command

The Military Sealift Command (MSC) operates a fleet of dry cargo ships and tankers in support of U.S. military forces. As a part of the U.S. Navy, this fleet is active in both peacetime and during military crises. These vessels are directly owned by the U.S. government, borrowed from the Ready Reserve Force (RRF) maintained by MARAD, or obtained through long-term charters of U.S. flag vessels owned by U.S. companies or citizens. According to its official website, MSC currently operates 122 active, non-combatant vessels in sealift, prepositioning, special mission, and naval fleet auxiliary force roles. MSC's operating plans call for a pool of fifteen Common User Tankers comprised of nine RRF and six long term chartered vessels. The six chartered vessels are privately owned, U.S. flag product tankers. For the purposes of this report, the chartered

vessels are considered the only MSC vessels that could be committed to supporting the transport of POLs during military emergencies. The RRF tankers are included with the National Defense Reserve Fleet discussed in the next section. It should be noted that these vessels are usually committed to on-going MSC duties, and they may not be available for sealift purposes. Table 2.3 contains the number, deadweight, and average age of the tanker sealift portion of the MSC fleet.

	Characteristics		
	#	DWT	Average Age
MSC Tanker Sealift Fleet	6	156,315	14.3

Source: 1) Military Sealift Command Website, www.msc.navy.mil, 2001.
2) Clarkson Research Studies, "Clarkson Register CD – 2001 Edition", London, January 2001.

Table 2.3, MSC Tanker Sealift Fleet Characteristics

National Defense Reserve Fleet & Ready Reserve Fleet

During World War II, a vast number of merchant vessels were constructed by the U.S. government to support the movement of supplies, military hardware, and troops from the United States to various locations around the world. Following the conclusion of World War II, the U.S. government possessed an excessive amount of tonnage for its sealift needs. To deal with the issue of these excess vessels, the NDRF was formed under the Merchant Ship Sales Act of 1946. Under this act, a portion of the excess tonnage was to be kept as an inactive fleet maintained by MARAD for use during national emergencies. During the decades following its inception, many vessels within the fleet were sold or scrapped, while naval auxiliaries and other government vessels retired from active service have been added to its total. The total number of vessels within the NDRF between 1946 and 2000 is graphed in Figure 2.8. The fleet currently encompasses 325 vessels of various types according to MARAD's Annual Report for 2000.

In terms of military sealift, the vessel totals for the NDRF are misleading. The vessels of the NDRF are maintained at a time-to-readiness of 60 days.[2] Further, as of September 2000, only 143 of these vessels were "being kept for the purposes of emergency activations, future historic display, spare parts, or congressionally legislated sale" according to the MARAD annual report for 2000. The remaining vessels are scheduled for scrapping or are being maintained by MARAD on behalf of other government agencies. For these reasons, the DoD only considers the use of a portion of this fleet in its current military sealift analyses. Within the pool of 143 "retention status" vessels is a subset of the NDRF referred to as the Ready Reserve Force (RRF), which is maintained at between 4 and 20 days of readiness.[3]

The tankers of the RRF serve as a source of additional tonnage for the DoD following the full mobilization of the MSC tanker fleet. In 1990, the RRF included 11 product tankers. The current total size and tonnage of the tanker portion of the RRF is presented in Table 2.4. All vessels within this fleet are product tankers of less than 80,000 dwt. The average age of the tanker portion of the RRF was 41 years in 2002, and the youngest vessel in this fleet was 32 years old. It should be noted that some of these vessels have limited usefulness in terms of interregional military sealift because of their small size and low speed. In addition, MSC occasionally uses RRF vessels for long term duties other than sealift, such as the current use of the Chesapeake and Petersburg in MSC's Prepositioning Program.[4]

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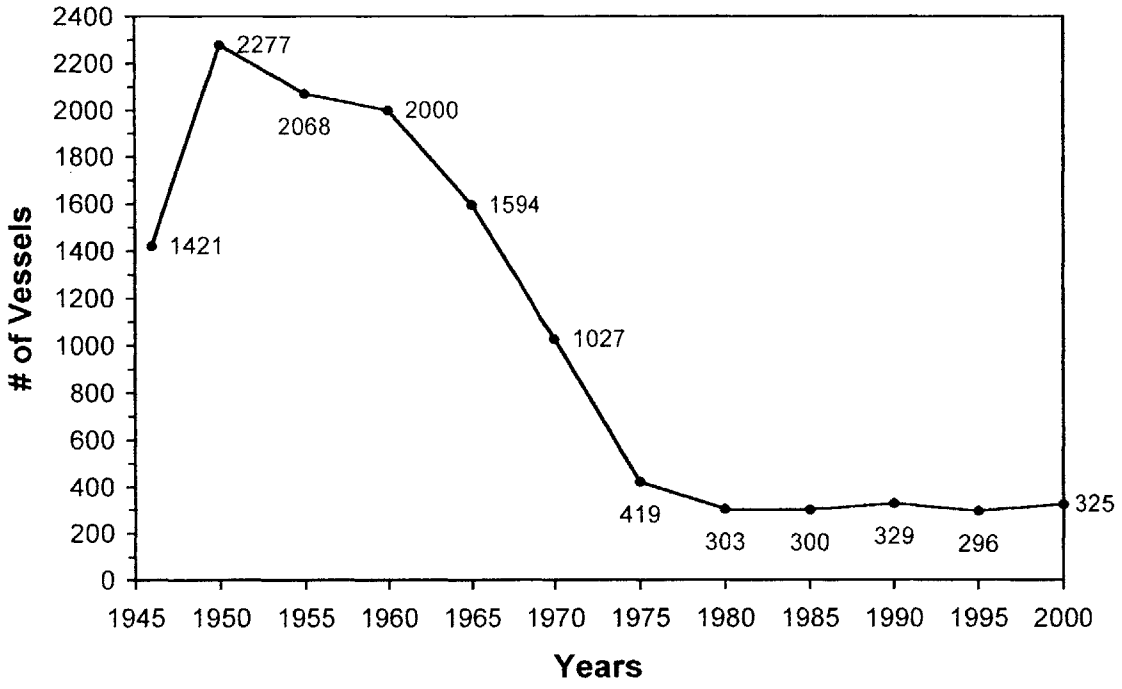
[2] Ibid.
[3] Maritime Administration, U.S. Department of Transportation, The Annual Report of the Maritime Administration for Fiscal Year 2000, July 2001.
[4] Military Sealift Command Website, www.msc.navy.mil, 2001.



Source: 1) Maritime Administration, U.S. Department of Transportation, The Annual Report of the Maritime Administration for Fiscal Year 1999, May 2000.
2) Maritime Administration, U.S. Department of Transportation, The Annual Report of the Maritime Administration for Fiscal Year 2000, July 2001.

Figure 2.8, Historical NDRF - # of Vessels

		Characteristics	
Vessel Name	DWT	Speed (knots)	Age
Alatna	7,300	10.4	46
Chattahoochee	7,300	10.4	46
Chesapeake	14,977	14.0	38
Mission Buenaventura	45,243	14.0	34
Mission Capistrano	45,877	14.0	32
Mount Washington	65,800	15.3	40
Nodaway	5,984	8.5	57
Petersburg	48,993	14.5	39
Potomac	35,330	15.7	38
Total Product Tankers	276,804		Avg. Age = 41

Source: 1) Military Sealift Command Website, www.msc.navy.mil, 2001.
2) American Bureau of Shipping, "ABS Record 2002", 134th Edition, Port City Press, Baltimore, 2002.

Table 2.4, RRF Sealift Tanker Characteristics

U.S. Flag Merchant Fleet

Private companies and citizens own the majority of the U.S. flag fleet. The U.S. flag fleet can be divided based upon the trading regions served by the vessels. The foreign trade share of the fleet sails between American ports and foreign ports or between foreign ports. The domestic portion of the privately owned, U.S. flag fleet sails between American ports. These trade routes are restricted to certain vessels under the U.S. flag through cabotage laws. These cabotage laws, in conjunction with the Merchant Marine Act of 1920, known as the Jones Act, require that vessels trading between U.S. ports meet the following requirements:

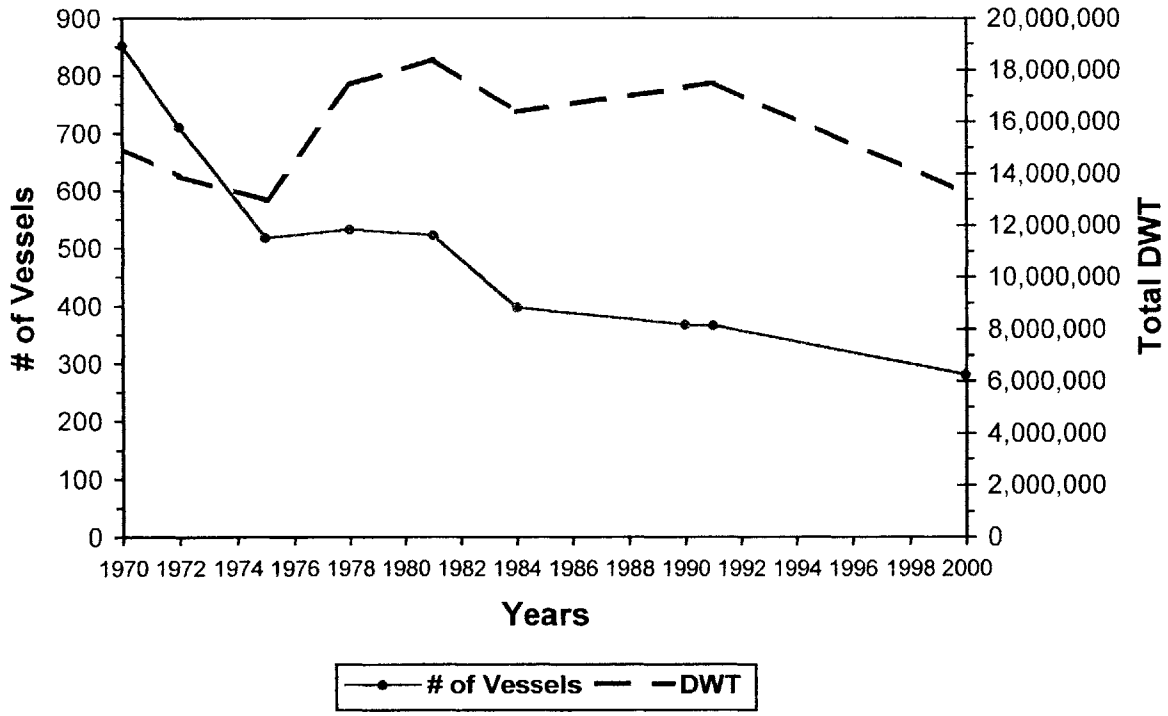
1) Vessels must be U.S. flag
2) Vessels must be owned by U.S. citizens
3) Vessels must be built and repaired in U.S. shipyards
4) Vessels must be crewed by U.S. citizens.

For privately owned, U.S. flag vessels operating on foreign trade routes, the competitiveness of the marketplace has resulted in a steady decline of this portion of the fleet over the past three decades. The higher crewing costs, higher insurance rates, more demanding regulations, and higher tax burden of vessels employing U.S. citizens and operating under the U.S. flag, as compared to most foreign flag vessels, has greatly reduced this segment. Many of the companies who owned these vessels have been forced to re-flag or sell their ships as they became uncompetitive in international trade.

A few older, U.S. flag tankers have been retained for the government-sponsored PL480 grain program. These privately owned tankers survive because U.S. flag carriers are guaranteed a portion of this trade. In 2001, there were approximately twelve U.S. flag

ex-tankers operating in this trade. A few of these tankers have not yet reached their non-double hull phase out dates under the requirements of the Oil Pollution Act of 1990 (discussed in Chapter 5), and these are included in the current figures in this report. The remaining PL480 vessels, now only capable of carrying dry bulk cargos, do not appear as tankers in any of the current figures in this document as they can no longer carry oil in U.S. waters.

With the domestic market protected from foreign competition, the cabotage fleet must compete only with land-based alternatives. This fleet has also benefited from the opening of the Alaska North Slope to oil production in the mid 1970's, which resulted in

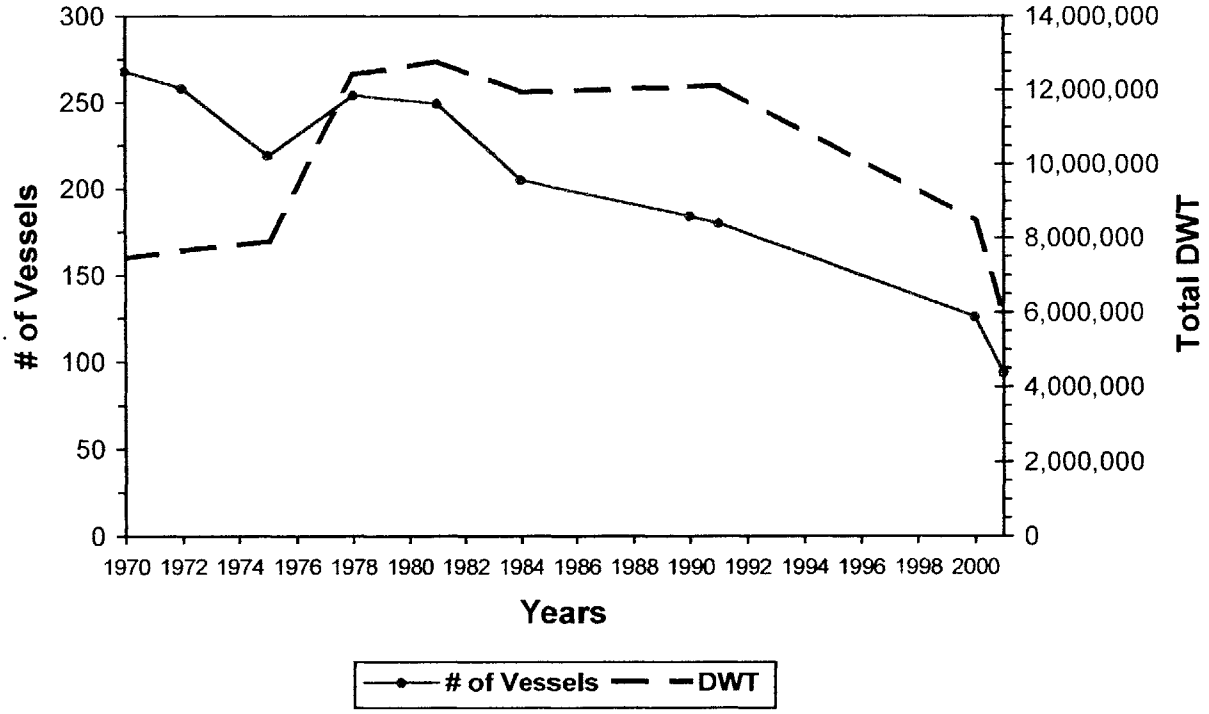


Note: Totals for 2000 include all self-propelled vessels over 1000 GRT including ITBs and ATBs.
Source: 1) MARAD Annual Reports for 1970, 1972, 1975,1978, 1981, 1984, 1990, 1991
2) Maritime Administration, "Cargo-Carrying Capacity of U.S. Flag Fleet by Area of Operation for January-June 2000", www.marad.dot.gov, 2001.

Figure 2.9, Historical Privately Owned, U.S. Flag Fleet – # of Vessels & DWT

substantial growth in the domestic crude oil trade. While the total domestic seaborne trade has grown substantially over the past thirty years, the average size and deadweight of vessels in this trade also grew. As a result, the domestic fleet has maintained a relatively stable size in terms of dwt while the number of vessels has declined steadily since 1970. The total number of ships and the deadweight tonnage of the combined domestic and foreign trades since 1970 are shown in Figure 2.9.

The U.S. flag fleet contains a significant number of tankers. The historical size, in terms of number of vessels and of capacity in barrels, of the privately owned, U.S. flag tanker



Note: DWT of tanker fleet for 2001 is estimated by dividing fleet capacity in barrels by 7.1 barrels/DWT.
Source: 1) MARAD Annual Reports for 1970, 1972, 1975,1978, 1981, 1984, 1990, 1991
2) Maritime Administration, "Cargo-Carrying Capacity of U.S. Flag Fleet by Area of Operation for January-June 2000", www.marad.dot.gov, 2001.
3) U.S. Coast Guard, U.S. Department of Transportation, "Status of the Replacement of U.S. Single Hull Tank Vessels with Double Hull Tank Vessels under OPA 90." 2001.

Figure 2.10, Historical Privately Owned, U.S. Flag Tankers – # of Vessels & DWT

fleet is shown in Figure 2.10. The U.S. flag tanker fleet, including integrated tug barges and articulating tug barges, contained a total of 94 tankers in 2001, according to a United States Coast Guard (USCG) report to Congress concerning the U.S. flag tanker fleet. The modern tanker fleet can be further separated into crude oil tankers, product carriers, chemical carriers, LNG and LPG tankers, and specialty tankers. Specialty tankers include asphalt, bitumen, and molten sulphur carriers. There are currently no LNG tankers or LPG tankers in the U.S. flag fleet. The most recent breakdown of the U.S. flag tanker fleet is presented in Table 2.5.

Type	# of Vessels	# of Double Hulls
Crude Carriers	28	4
Product Tankers	55	20
Chemical Tankers	15	3
Specialty Tankers	1	0
LNG & LPG Tankers	0	0
Fleet Total	94	27

Source: 1) U.S. Coast Guard, U.S. Department of Transportation, "Status of the Replacement of U.S. Single Hull Tank Vessels with Double Hull Tank Vessels under OPA 90." 2001.
2) Clarkson Research Studies, "Clarkson Register CD – 2001 Edition", London, January 2001.

Table 2.5, Composition of Privately Owned, U.S. Flag Tanker Fleet in 2001

As with the EUSC fleet, not all of these tank vessels are considered militarily useful by the DoD. If the same Joint Chiefs of Staff standard applied to the EUSC tanker fleet is applied to the U.S. flag tanker fleet, there is a substantial reduction in the size of this fleet. In addition, the OPA-90 phase out dates for non-double hulled tankers cited by the report are used to remove individual vessels that can no longer trade in U.S. waters after June 2001. While these retired tankers could presumably still trade in other areas of the world, the combination of similar MARPOL regulations for other trade routes and of the present inability of U.S. flag tankers to compete in the remaining markets, except in

special circumstances, justifies their elimination. After all vessels have been screened for capacity, speed, and phase out requirements, the fleet is reduced from 94 to 62 vessels as of July 1, 2001. Of these militarily useful tank vessels, only 19 are double-hulled. It should be noted that U.S. flag vessels on long term charter to MSC were removed to avoid double counting and that specialty tankers, such as asphalt carriers, have been removed. In addition, integrated and articulating tug-barges were removed because these tank vessels were excluded by the Joint Staff/OSD study approved by the Director of the Joint Staff on January 27, 2001. These tug-barge combinations may have been excluded because either their operating speeds were below 12 knots or they were deemed unsuitable for sustained transoceanic voyages. Although some of the newer tug-barge combinations may be able to travel at 12 knots, it apparently would be unsafe for the tug and barge to disconnect if the weather got too rough on a transoceanic voyage.

The total U.S. flag tanker fleet database for 2001 and the militarily useful, U.S. flag tanker fleet database for July 1, 2001, are included as Appendix C. Both databases utilize the U.S. Coast Guard database of all U.S. flag tank vessels as of February 2001 as a

Type	# of Vessels	# of Double Hulls
Crude Carriers	16	1
Product Tankers	37	15
Chemical Tankers	9	3
Fleet Total	62	19

Note: Vessels on MSC Charter, asphalt carriers, ITBs, and ATBs excluded.
The JSC 1996 militarily useful standard plus OPA-90 phase out requirements by the end of June, 2001, were applied to the remaining tankers.
Source: 1) U.S. Coast Guard, U.S. Department of Transportation, "Status of the Replacement of U.S. Single Hull Tank Vessels with Double Hull Tank Vessels under OPA 90." 2001.
2) Clarkson Research Studies, "Clarkson Register CD – 2001 Edition", London, January 2001.

Table 2.6, Militarily Useful Privately Owned, U.S. Flag Tanker Fleet in July 2001

baseline source. Table 2.6 summarizes the composition and characteristics of the militarily useful portion of the privately owned, U.S. flag tanker fleet in July 2001.

STRATEGIC SEALIFT SOURCES

The MRS-05 Sealift Tanker Analysis is the most recent tanker sealift study by the Department of Defense (DoD). According to the unclassified portion of the MRS-05 report, the Military Sealift Command's fleet, the Ready Reserve Force, the privately owned U.S. flag fleet, and the EUSC fleet comprise the primary sources of strategic sealift for U.S. military planners. In the event of a protracted conflict, the DoD would presumably call upon these sources of tankers in the following order:

1. Vessels owned or chartered by the Military Sealift Command
2. Vessels chartered from the U.S. market on a voluntary basis (required by law before other government vessels may be activated)[5]
3. Ready Reserve Force vessels from the NDRF
4. Requisitioned U.S. Flag vessels (requisitioning enabled after Presidential declaration of a national emergency)
5. Requisitioned EUSC vessels (requisitioning enabled after Presidential declaration of a national emergency)

While there are a few tankers within the NDRF not used by the RRF, the remaining tankers of the NDRF are presumably excluded as a result of the age of these vessels and the extended period of time required to reactivate these vessels.

In certain wartime scenarios, the U.S. military could gain access to tankers promised by NATO and/or South Korea.[6] However, as will be discussed in the later chapters, the

[5] Military Sealift Command Website, www.msc.navy.mil, 2001.

most pressing war scenarios in terms of POL sealift are expected to involve regions that do not require participation by our NATO or South Korean allies. In addition, the South Korean's had pledged no tankers as part of their sealift contribution according to the GAO report of 1990. The MSC is also able to charter vessels on the world markets to meet sealift requirements. This method was utilized during the Gulf War after MSC and RRF sources were exhausted. This conflict was of short duration and did not involve an opponent capable of attacking this chartered shipping. This approach may not be feasible in all scenarios, and it is outlined as a last resort by military planners in the unclassified version of the MRS-05 study.

Table 2.7 summarizes the total strategic tanker sealift sources available to U.S. military planners in 1990 and in July 2001. As previously mentioned, the EUSC fleet provided 22 percent of America's controlled tanker sealift capacity in June 1949. The EUSC fleet

	Militarily Useful Tankers		
	1990	2001	Change
Military Sealift Command[1,2]	24	6	- 75%
Ready Reserve Fleet[1,2]	11	9	- 18%
U.S. Flag Merchant Vessels[1,4]	134	62	- 54%
Effective U.S. Control Fleet[1,3]	92	63	- 32%
Total	261	140	- 46%

Note: The most recent JCS standard for militarily useful tankers was applied to vessels of the EUSC and U.S. flag fleets for 2001. An earlier standard was applied to these fleets in the 1990 GAO report.

Source: 1) U.S. General Accounting Office, Tax Policy: "Uncertain Impact of Repealing the Deferral for Reinvested Shipping Income", (GAO/GGD-90-35), Washington, D.C., 1990.
2) Military Sealift Command Website, www.msc.navy.mil, 2001.
3) Appendix B for Militarily Useful, EUSC Tanker Fleet
4) Appendix C for Militarily Useful, U.S. Flag Tanker Fleet

Table 2.7, U.S. Strategic Tanker Sealift Sources for 1990 and 2001

[6] U.S. General Accounting Office, Tax Policy: "Uncertain Impact of Repealing the Deferral for Reinvested Shipping Income", (GAO/GGD-90-35), Washington, D.C., 1990.

provided 35 percent of the DoD's primary tanker sealift vessels in 1990. As of 2001, the EUSC fleet's contribution had reached 45 percent of the total vessels in the primary strategic sealift pool. The total estimated dwt of the primary fleet of militarily useful tankers was 7,261,252 in 2001. See Appendix B, Appendix C, Table 2.3, and Table 2.4. Of this total dwt, the EUSC tanker fleet contribution was 52 percent.

CONCLUSIONS

Several conclusions can be drawn about the primary sources of strategic sealift vessels available to U.S. military planners from the information presented in the previous sections. These conclusions can be summarized as follows:

1) The U.S. owned, foreign flag fleet has been declining in terms of total vessels and total dwt since 1976 and 1978, respectively. Between 1986 and 2000, the total carrying capacity of the fleet fell by 53 percent. The increase in the average age of this fleet after 1978 and the decrease in the number of U.S. companies participating in this industry after 1987 are also indicators of a decline within this fleet.
2) The size of the EUSC fleet is nearly synonymous with the size of the U.S. owned, foreign flag fleet, and it has followed the latter fleet's historical decline. Tankers comprised 84 percent of the total deadweight of the EUSC fleet in 2000. The EUSC tanker fleet experienced a 57 percent decline in DWT between 1986 and 2000. The number of militarily useful tankers within the EUSC fleet has fallen nearly 32 percent in the past 11 years.

3) The Military Sealift Command has exclusive access to just 6 tank vessels to commit to strategic sealift efforts as of 2001. These tankers are key contributors to daily MSC duties and may not be available for tanker sealift needs because of other commitments.

4) Many of the vessels of the NDRF are no longer included as strategic sealift assets by the Department of Defense. The tankers in the Ready Reserve Force portion of this fleet, which is still included in U.S. strategic sealift planning, has shrunk 18 percent, to 9 vessels, since 1990, and it has an average age of 40.1 years. Several vessels lack the speed and capacity to serve in a significant interregional sealift role. These vessels may be unavailable at times as they can also called upon by MSC for extended support roles, such as the Prepositioning Program.

5) The privately owned, U.S. flag fleet has witnessed a steady decline in terms of total fleet size and of total tankers over the past 30 years. The militarily useful portion of the U.S. flag tanker fleet has fallen by 54 percent since 1990. This sharp decline is the result of the application of more recent Joint Chief of Staff bulk liquid carrier standards, reflagging, non-double hulled tanker phase out requirements, the scrapping of vessels, and the replacement of product tankers with combination tug-barges.

6) Between 1990 and 2001, the total pool of strategic sealift vessels available to the Department of Defense fell from 261 to 140 vessels, or 46 percent. The EUSC fleet's contribution, in terms of number of militarily useful tankers, to this pool has risen from 35 to 45 percent despite its own decline during this

period. In June of 1949, the EUSC militarily useful tankers made up 22 percent of the military's combined tanker sealift resources by dwt. The EUSC militarily useful tankers comprised 52 percent of the total primary tanker sealift resources in terms of dwt for 2001. As such, the remaining EUSC militarily useful tanker fleet provides a larger portion of the dwt to America's strategic tanker sealift resources than it did in June of 1949, which was only a few years after the inception of the U.S. effective controlled concept created during World War II.

7) This chapter has relied on MARAD databases and on other sources referencing MARAD databases to establish the historical EUSC fleet. In Chapter 5, we will analyze the accuracy of the most recent databases in more depth when describing the current EUSC militarily useful tanker fleet.

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CHAPTER 3

LEGAL HISTORY

In Chapter 2, the decline in the EUSC fleet was shown over the past quarter century. In this chapter, the changes in U.S. tax laws concerning shipping income earned by U.S. corporations through foreign subsidiaries are presented. The effect of these changes lags the introduction of the new tax law; however, the effect on the U.S. owned, foreign flag fleet and the EUSC fleet can be discerned by reexamining the figures in Chapter 2. The remainder of the text in this chapter is sourced from the master's thesis of Timothy Glinatsis of M.I.T.

"REVENUE ACT OF 1962

At the time that the Revenue Act of 1962 was under consideration by Congress, U.S. shipowners of foreign flag vessels operated under the general rule that U.S. taxpayers operating abroad are not subject to U.S. taxation on the income of their foreign subsidiaries so long as the foreign earnings were not paid upstream and the foreign subsidiaries were not operating in U.S. business. This rule, which still applies today to most U.S. companies operating abroad, allowed for the deferment of U.S. tax on foreign shipping income pending its payment or "repatriation," usually in the form of dividends, to U.S. taxpayers. In effect, tax deferral provided U.S. shipowners with options for reinvestment and capitalization.

The 1962 tax bill was aimed at certain types of income (e.g., "tax haven" income) earned by a "controlled foreign corporation" or "CFC" by subjecting those types of income to U.S. taxation irrespective of repatriation to U.S. taxpayers. Of most importance in the income classes established by the 1962 Act is "Subpart F" income which can occur in the case of a CFC in which the value or voting power is more than 50% controlled (directly, indirectly or constructively) by U.S. taxpayers, accounting for only those with stakes exceeding 10% of the vote. The 1962 Act imposed U.S. tax on the shareholders of the CFC – not on the foreign entity itself – based on the shareholders' appropriable portions of the Subpart F income. All income that falls under this category is treated as a paid dividend, whether a dividend is paid or not.

During the congressional deliberations on the 1962 Act the Senate Finance Committee gave specific attention to shipping income earned by foreign subsidiaries of U.S. shipowning companies. The result was the Finance Committee voted to exclude such shipping income from the reach of Subpart F and in its Report explained that "this exception was provided by your committee primarily in the interests of national defense." The 1962 Act that was ultimately passed by Congress contained this specific exclusion.

Consequently, the Revenue Act of 1962 continued tax deferral for shipping income of U.S. owned foreign shipping companies, but it laid the foundation for CFC taxation to come.

TAX REDUCTION ACT OF 1975

Prior to 1976, a blanket exemption existed for companies engaged in international shipping, absolving their profits from CFC tax obligations. The Tax Reduction Act of 1975, effective in 1976, eliminated the previous exemption for the shipping industry. As a result, all income from international shipping became taxable; full-scale shipping operations, bareboat chartering, ship sales, and unrelated party income were all included in taxable income. Regardless, Congress was aware of the potential impacts such taxation had on an American-controlled merchant fleet in times of war or national emergency. As such, in H. Rep't No. 93-1502, 93d Cong., 2d Sess. (1974) accompanying H.R. 17488, at p. 106 (H.R. Committee Report accompanying a bill to repeal the shipping exemption of subpart F) it was noted:

> "...the interests of the United States are best served if we have a significant U.S. owned maritime fleet. To assume and maintain this status, large amounts of capital are necessary. Further, many U.S. investors in foreign shipping corporations find their investments in such corporations "locked in" by the corporations' financing arrangements and its [sic] need to retain amounts for repairs and maintenance. If the present exclusions for shipping income were simply terminated and such income treated as constructively distributed to U.S. Shareholders, the foreign corporation's ability to meet these obligations would be jeopardized."

In response, Congress excluded from subpart F any international shipping income that was timely reinvested in specified foreign shipping investments. Included in "shipping income" were such items as dividends and interest from other related foreign corporations, gains from the sale of stock in such entities, the corporation's distributive share of a partnership's foreign shipping income, and of course income generated by a

corporation's own international shipping activities. A provision of these rules permitted CFCs to combine foreign shipping incomes and qualified investments to determine to what extent subpart F income would be offset. Though reinvestment was an option, it often proved to be of little value. Restrictions of the deferral required that reinvestment totals not be exceeded by depreciation or sold assets in any given year; any reinvestment made under those circumstances would result in the taxation of the corresponding income. Similarly, income retained for future long-term investment was not protected. Thus, any excessive qualified investment in a given year could not be exempted in future years.

TAX REFORM ACT OF 1986

The Tax Reform Act of 1986 further influenced the shipping industry by eliminating the last vestiges of tax deferral available to U.S. controlled foreign shipping companies, while leaving existing tax burdens. First, the reinvestment exemption was repealed, meaning that capital must be obtained from earnings after tax. Secondly, the ability to carry-over E&P (earnings and profits) deficits from pre-1987 years was eliminated, and subsequently such deficits could not be used to discount subpart F income. Lastly, the recapture provision which applied to prior year deferrals and reinvestment in international shipping businesses was continued, limiting companies' ability to make investments when needed.

Additional changes were made regarding a CFC's ability to offset E&P deficits of a related CFC's subpart F income. As required, only CFCs in the same chain of ownership, which are 100% owned by other members of the chain, and are formed in the same

jurisdiction, may offset each other's subpart F income. This stipulation holds many impracticalities, in that the complexity of foreign registries alone does not lend itself to alignment under a single jurisdiction. The result is a disallowance of risk distribution both in jurisdiction and ownership - as joint ventures and financing options are eliminated through the 100% ownership requirement.

The U.S. controlled foreign fleet is now responsible for taxes on its offshore earnings without any avenue for exemption by reinvestment. Similarly, U.S. shipowners are subject to taxation without the option of offsetting for economic operating losses generated in years before 1987."[7]

[7] Glinatsis, Timothy W., "The Effective U.S. Controlled Shipping Fleet: Causes of Decline and Proposed Remedies", Master's Thesis at Massachusetts Institute of Technology, September 2002.

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CHAPTER 4

LITERATURE REVIEW

This chapter provides support for the need for the EUSC fleet in terms of its military relevance through a review of literature on the subject. The remainder of this chapter is an excerpt from the master's thesis of Timothy Glinatsis of M.I.T.

"INTRODUCTION

The discussion surrounding the size of the Effective United States Controlled fleet is one that has been ongoing for many decades, particularly since the revocation of the income deferral clause by the Tax Reform Act of 1986. As such, literature is available on this very subject, and much can be learned through a review of this literature. This section of the report summarizes and discusses key points presented in representative pieces of literature. We wish to learn to what extent this literature can explain the decline in the size of the EUSC fleet. We have separated the documents into the following categories: Justification for the EUSC Fleet, Questioning the Impact of the Tax Reform Act of 1986, Current Issues, and Attempts at Improving the Competitiveness of U.S. Shipowners.

JUSTIFICATION FOR THE EUSC FLEET

Introduction

This research is based on the premise that the EUSC fleet can be of military value in time of need. We start the literature review with two documents that explain the justification

for the EUSC fleet.

Boleslaw Adam Boczek - Flags of Convenience - An International Legal Study

Mr. Boczek's book, published in 1962, presents a very detailed analysis of the definition and justifications for using flags of convenience in international shipping. Offered in the book is an excellent presentation on the history and predicted future of the Effective U.S. Controlled fleet.

Of most importance in this book is the discussion of the military usefulness of American-owned, foreign flag ships. Despite being written in 1962, the discussion clearly shows America's dependence on foreign flag ships during times of emergency. Having access to these ships is an advantage that is clear enough to see. Yet, the primary importance of these ships, according to Mr. Boczek, is that the U.S. military includes these vessels in its count of ships available for transporting military cargo. Were these ships removed from the count, or were the EUSC to dwindle from existence entirely, would the U.S. retain the ability to successfully execute a multiple theater war? The answer, according to Boczek (and the Navy spokesmen cited in the book), is no.

Federation of American Controlled Shipping – "The EUSC Fleet – Trends Relating to Present and Future Availability"

On January 13, 1986, The Federation of American Controlled Shipping (FACS) published an organized discussion of Effective U.S. Controlled shipping issues. A very thorough review of the definition of EUSC vessels is included, and is accompanied by statistical analysis of the fleet's decline. However, of particular import to our discussion

is the collection of quotes regarding EUSC. These statements show the supporting opinions of assorted officials throughout the 20th century.

The Joint Chiefs of Staff, in 1945, included EUSC ships in its strategic outline:

> "To be effective as an instrument of national defense U.S. merchant shipping should be under U.S. flag or effective U.S. control and should be of such capacity that it is able to absorb substantial initial losses which may be occasioned by either a surprise attack or an efficient submarine and air interdiction of sea lanes, or both, and still perform the following services. . ."

The National Academy of Sciences-National Research Council completed a study in 1959 entitled "The Role of the U.S. Merchant Marine in National Security." The report included the following comments on EUSC:

> "For purposes of indisputable control, it would be preferable that all U.S. owned merchant shipping be documented under U.S. flag. Such an ideal situation does not exist. At the same time, U.S. flag merchant tonnage is not adequate to meet our total wartime needs. This is particularly true with tankers . . . In the event of war it will be necessary to augment U.S. flag shipping. The Maritime Administration and the Navy Department have determined jointly that it will be practicable to bring a portion of the U.S. owned foreign flag shipping under direct U.S. control in the event of a national emergency. This effective U.S. control concept is a matter of expediency, rather than choice, and applies essentially to designated shipping under the 'flags of convenience.'"

Then Under Secretary of State C. Douglas Dillon also stated, in 1959, his support for the EUSC:

> "My final thought on this subject is that, until such time as it may be feasible for these American shipowners to operate competitively under the United States flag, my Government retains its interest in the continued operation of ships under foreign flags, including the PANLIBHON (Panama, Liberia and Honduras) registries. From our viewpoint there are important and valid defense requirements which support this position."

Attesting to the historical success of EUSC inclusion, the Office of Civil and Defense Mobilization reported in 1960:

> ". . .in practice during World War II and Korea, when the United States called on privately-owned tonnage to meet defense needs, PANLIBHON vessels subject to emergency utilization by the United States were immediately made available. In neither case did serious problems develop because of the foreign nationality of the crews."

In 1966, Maritime Administrator Nicholas Johnson confirmed the reliability of EUSC ships:

> "Certainly if the history of Second World War and Korea is valid for purposes of future planning, history is on the side of this judgment. As a practical matter these ships have been available to the United States when needed. . .We are not now talking about ships owned by foreign citizens and

> registered in foreign countries – which have in a small number of cases refused to carry our defense cargoes – but ships owned by American citizens. We are talking of plans that, by and large, those ships will continue to serve the raw materials import trades that they now serve – although some of them would be directly involved in the defense effort (and are today)."

Secretary of Defense, Robert S. McNamara, said in 1967:

> "In a full scale national emergency, we believe 'effective U.S. controlled ships' will be as available to DoD as U.S. flag ships."

Admiral James L. Holloway III, Chief of Naval Operations, said in his policy statement on March 1, 1978, the following things about EUSC:

> "The United States has plans for the utilization of foreign flag ships of the Effective U.S. Control Fleet. These are U.S. owned or U.S. controlled ships of foreign registry of 1,000 gross tons or more, which are under contract to the Maritime Administration. These can be reasonably expected to be made available for U.S. use in time of emergency."

On June 8, 1981, Secretary of Defense Caspar W. Weinberger told the National Maritime Council the following things regarding EUSC ships:

> "The EUSC fleet is composed of some 465 ships primarily under Liberian registry with a few under Panamanian and Honduran flags. These ships, owned or controlled by U.S.

citizens, are considered in contingency plans for sealift requirements primarily as a source of ships to move essential oil and bulk cargoes in support of the national economy. The majority of those vessels are not considered militarily useful...

The EUSC countries of registry have stated that they will assert no control over the employment of ships on their registries, and that they will not interfere with the exercise of emergency authority by the governments of shipowners. They have indicated, with varying degrees of formality, that they would not interpose any objections to the exercise of U.S. requisitioning authority over U.S. owned ships ...the real basis for the effective U.S. control concept is the authority provided by Section 902(a) of the Merchant Marine Act of 1936 which authorizes the Secretary of Commerce to requisition ships in time of war or national emergency regardless of registry. . . Although we do not consider [foreign] crews as reliable as U.S. crews, we have no basis to believe that most of the ships in question would not be made available when needed."

"National Security Sealift Policy", National Security Directive #28, October 5, 1989

President George Bush signed this national security sealift policy directive on October 5, 1989. Key portions of the document of interest to us are:

"...in addition to the U.S. flag fleet we will continue to rely on the U.S. owned and allied shipping resources to meet strategic commitments to our established alliances. The Department of Transportation is responsible for ensuring that the appropriate legal and procedural mechanisms for exerting effective control over "effective U.S. control" ships are in place.

> ...development and implementation of specific sealift and supporting programs will be made with full consideration of the costs and benefits involved. New programs to enhance our ability to meet national security sealift requirements shall compete for resources with other national security programs."

Authors' Comments

What we hoped to demonstrate by including this first portion of Chapter 4 was the acknowledged importance of the EUSC fleet. Mr. Boczek's observations, coupled with the numerous government quotes that follow, show that the greatest value in maintaining an EUSC fleet is not commercial, but military in nature. The practice of using U.S. owned, foreign flag ships for the transport of commercial American cargo (and military cargo, in few instances) during times of national emergency is "tried and true," and presents a viable means of closing the capacity gap created by the decrease in U.S. flag ships."[8]

[8] Glinatsis, Timothy W., "The Effective U.S. Controlled Shipping Fleet: Causes of Decline and Proposed Remedies", Master's Thesis at Massachusetts Institute of Technology, September 2002.

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Glinatsis, Timothy W., "The Effective U.S. Controlled Shipping Fleet: Causes of Decline and Proposed Remedies", Master's Thesis at Massachusetts Institute of Technology, September 2002.

CHAPTER 5

ANALYSIS OF THE EUSC FLEET: MILITARY RELEVANCE & FLEET PROJECTIONS

In Chapter 2 of this study, the role of the EUSC fleet in providing the U.S. military with a significant source of sealift vessels was discussed. In terms of the transport of POLs, the 2001 EUSC fleet was shown to offer 63 militarily useful tankers, or 45% of the total pool of available tankers for military sealift. In this chapter, the current EUSC fleet for 2002 will be examined by investigating the parent companies found in MARAD's databases. The militarily useful tankers of the EUSC fleet will be discussed in the context of current and future military sealift analyses. These projections will take into account the effects of the Oil Pollution Act of 1990 and of the MARPOL 13/G regulations on the size of the EUSC fleet through 2015. In addition, a limited forecast of the militarily useful, U.S. flag tanker fleet will included. Finally, the effects of uncertainty concerning the replacement of scrapped non-double hull tonnage by current U.S. foreign flag vessel owners will be presented.

MRS-05: UNCLASSIFIED PORTIONS OF A MILITARY ANALYSIS

In 2001, we received an unclassified version of the U.S. military's latest sealift tanker analysis. This Joint Staff/OSD study centers around the transport of the primary fuel products used by the military to specific theaters of operation. The sealift analysis is defined by the following major assumptions:

- ✓ Sufficient tanker sealift resources must be available to U.S. military planners to support dual, simultaneous theater wars or conflicts as defined by the National Military Strategy.
- ✓ Tanker requirements are based upon meeting the shortfalls in military fuel product needs after sources within the theater are depleted.
- ✓ Only tankers meeting the Joint Chiefs of Staff standard for militarily useful tankers were utilized. Qualifying vessels that possess coated cargo tanks are the most desirable vessels.
- ✓ The tanker fleet used in this study is based upon a forecast for the year 2005 of available vessels from the MSC, the RRF, U.S. flag merchant fleet, and the EUSC.
- ✓ No vessels were set aside to support the economy of the United States.

Although many of the details were removed in the unclassified version of the analysis, the report does provide useful information about the needs of U.S. military planners. The scenarios involving U.S. military operations in Southwest Asia and the Far East, especially Korea, required the largest amount of tanker sealift support. The fuel products, which include JP-8, JP-5, and F-76, requiring transport would be sourced under all scenarios primarily from the United States, Europe, or Singapore.

This POL sealift would be shipped using a forecasted pool of strategic sealift sources as determined by MARAD and MSC for the year 2005. Their forecasts estimated a pool of 127 militarily useful, bulk liquid carriers available to the Department of Defense in 2005. These forecasts took into consideration the decline in the production of the Alaskan North Slope oil fields and the current rate of decline in the coastwise petroleum product trades of the U.S. In addition, their forecasts accounted for the phaseout of single hull, commercial tankers in the U.S. flag and EUSC fleets under OPA 90 and MARPOL 13/G regulations. The breakdown of this fleet by source is contained in Table 5.1. The planners creating this study separated seventeen shallow draft vessels from the original

pool of 127 vessels for use as intra-regional supply vessels. In this study, shallow draft RRF, Offshore Petroleum Discharge System (OPDS) tankers, and other commercial vessels of less than 20,000 dwt and 150,000 barrel capacity comprised the intra-theater fleet. The OPDS tankers are all drawn from the RRF, and the fleet included the SS Potomac, SS Petersburg, SS Mount Washington, and SS Chesapeake in 2000.[9]

The remaining 110 vessels are employed as inter-regional sealift tankers. As previously mentioned, the planners preferred vessels with coated tanks for this inter-regional sealift. The use of coated tanks is preferred because it improves the flexibility of the vessel by allowing it to carry all of the primary fuel products. Vessels with uncoated tanks are generally permitted to carry only one type of fuel product, F-76, following extensive cleaning of the cargo tanks. The 87 inter-regional sealift tankers with coated tanks form the fleet used in the analysis of possible military sealift scenarios. Within this fleet, 37 of the tankers would come from the EUSC fleet.

Tanker Fleets	# of Vessels	Inter-regional Sealift Tankers	
		All vessels	Vessels w/ Coated Tanks
Military Sealift Command	5	5	5
Ready Reserve Fleet	10	3	3
U.S. Flag Merchant Fleet	55	51	42
EUSC Fleet	57	51	37
Totals	127	110	87

Source: Joint Staff/OSD, Department of Defense, "MRS-05 Tanker Sealift Analysis" (Unclassified Version), U.S. Department of Defense, 2001.

Table 5.1, DoD Forecast of Sealift Tanker Fleet in 2005

[9] Maritime Administration, U.S. Department of Transportation, The Annual Report of the Maritime Administration for Fiscal Year 2000, July 2001.

The analyses of the various scenarios covered by the MRS-05 study were performed using the Model for Inter-Theater Deployment by the Air and Sea, or MIDAS. The ability of available U.S. strategic sealift tanker sources to meet the sealift requirements of each scenario was evaluated based upon three Measures of Effectiveness (MOE). Only the description of MOE-1, which refers to the ability of the sealift fleet to avoid military fuel shortfalls during the early stages of a conflict, is pertinent to the current discussion. However, the results of the study indicate that the MRS-05 fleet of 87 tankers with coated tanks is insufficient to meet the standards of these MOEs in all scenarios. One solution, which is referred to as the Added Ship case, calls for the use of 20 of the 23 available uncoated tankers. When the additional tankers are employed, all evaluated scenarios achieve acceptable MOEs for 2005 except for MOE-1 in the Southwest Asia eastern region scenario. An alternative to adding uncoated tankers is also cited. Defense Energy Support Center (DESC) requirements and projections call for the assumption of minimal Host Nation Support (HNS) in performing these tanker sealift analyses. If additional in-theater sources of fuel products are assumed, which is referred to as the Added HNS case, then 78 tankers from the baseline MRS-05 fleet of 87 tankers are sufficient to achieve all applicable MOEs in all scenarios.

CAPACITY ANALYSIS OF THE EUSC TANKER FLEET

The MRS-05 study does not provide fleet projections after 2005 when the OPA 90 and MARPOL 13/G regulations will begin to have a more pronounced effect. Our research develops projections of the capacity of the militarily useful, EUSC tanker fleet through 2015. The decline of the EUSC fleet over the past three decades and the looming

enforcement of OPA 90 and MARPOL 13/G regulations make projections beyond 2005 an important subject. The first step in forecasting the future of this fleet is the construction of a capacity analysis for the fleet in 2002. The recreation of the MRS-05 analysis was considered as a possible way to evaluate the EUSC fleet through 2015. However, the amount of classified information required to achieve the level of detail involved in the MRS-05 study proved prohibitive. Instead, an analysis was generated that would provide the capacity of the militarily useful, EUSC tanker fleet in a given year based upon voyages to an unspecified destination 3,000 nautical miles from an unnamed loading port. The value of 3,000 nautical miles was determined by reviewing the unclassified portions of the MRS-05 study. In this report, it appeared that the most pressing scenarios, in terms of fuel deliveries, involved conflicts in Southwest Asia, on the Korean Peninsula, and in mainland Japan. We concluded that Singapore and Europe would be the closest reliable supplier regions for most scenarios under consideration in MRS-05. The approximate distances from Singapore to South Korea, Singapore to Southwest Asia, and Europe's Mediterranean coast to Southwest Asia (via the Suez Canal) averaged on the order of 3,000 nautical miles.

For this analysis, the term *capacity* refers to the barrels delivered per month and to the ton-miles attained per month. While this steady state analysis is more limited than the MRS-05 study, the projections generated are sufficient to demonstrate the estimated rate of decline in the capabilities of the pertinent EUSC tanker fleet.

EUSC, Militarily Useful Fleet as of June 2002

In Chapter 2, the latest strategic sealift capacity available to U.S. military planners as of 2001 is presented. The EUSC contribution is provided based upon a MARAD database of EUSC militarily useful tankers for January 2001 with 63 vessels and a total dwt of 3,743,878. We also obtained a MARAD database for militarily useful tankers for January 2002, which contained 63 vessels with a combined dwt of 2,996,856. Before determining the capabilities of the current EUSC, militarily useful fleet, the size and composition of the EUSC fleet as of June 2002 would need to be determined. Creating an independent, current database was undertaken in order to confirm MARAD's information. We felt this investigation was important given the increasingly global shareholder base of publicly traded shipping companies, the rise in joint ventures, and the restructuring of the world's fleet as a result of double hull tanker legislation and mergers.

The determination of a vessel's qualifications as an EUSC candidate can be complicated. The greatest concern is the issue of the nationality of the majority ownership of the vessel. For a vessel to qualify for the EUSC fleet, it must be more than 50 percent owned by a U.S. citizen or corporation (that could be the parent of a foreign subsidiary), and it must meet the requirements that force the owners to pay U.S. taxes on the income from these ships. An additional complicating factor that we took into account is that ships on capital leases are treated as wholly owned vessels of the leasee for tax purposes by the U.S.

There is historical precedence for joint ventures with foreign firms by U.S. based shipping companies. Following the passage of the Tax Reform Act of 1986, the percentage of foreign ownership in the U.S. controlled fleet began to increase. A 1990 study found that this percentage had become particularly high among newer vessels.[10] By 1989, while older vessels in the U.S. owned, foreign flag fleet involved nearly no foreign investment, the pool of vessels built in the previous five years were 33.6 percent foreign owned. This survey also found that 31 of the 374 vessels assumed to be a part of the U.S. owned, foreign flag fleet, according to the 1988 MARAD database, were actually majority owned by foreign interests. Thus, these vessels would qualify neither as U.S. owned, foreign flag vessels nor as EUSC ships.

The January 2001 and January 2002 MARAD databases are the starting point for constructing a M.I.T. database of militarily useful, EUSC tankers for June 2002. We first reviewed the database for January 2001 for comparison to 2002. The operating companies in the 2001 MARAD database were:

- ✓ OMI Marine Services LLC
- ✓ OMI Bulk Management Co.
- ✓ Exxon Corporation
- ✓ OSG Corporation
- ✓ Mobil Shipping Co. Ltd.
- ✓ Fairfield-Maxwell Ltd.
- ✓ Fairfield-Maxwell Services
- ✓ General Maritime
- ✓ Conoco, Inc. (TX)
- ✓ Conoco Shipping

[10] Price Waterhouse, Survey of American Controlled Shipping, Prepared for Federation of American Controlled Shipping, January 25, 1990.

- ✓ Chevron
- ✓ Dorval Kaiun
- ✓ Hiltveit Associates.

Next, we investigated the operating companies and associated parent companies in the January 2002 database to confirm the EUSC status of each vessel. The list of operating companies found in the MARAD database for January 2002 is:

- ✓ Alcoa Steamship Co., Inc.
- ✓ ChevronTexaco Shipping Co.
- ✓ Conoco Shipping Co.
- ✓ El Paso Marine Co.
- ✓ ESSO SAPA
- ✓ International Marine Transportation
- ✓ OMI Corporation
- ✓ OMI Marine Services LLC
- ✓ OSG Ship Management, Inc.
- ✓ PCS Phosphate
- ✓ Pertamina
- ✓ Ravenscroft Shipping Inc.
- ✓ Seaarland Shipping Management
- ✓ Y Ships USA, Inc. (Florida).

For each of these 2002 companies, a current or former employee was contacted to discuss the company, its current fleet, the types of vessel leases involved, and the nationality of the majority ownership of each vessel. In addition, each vessel's hull type and cargo tank coating information were collected. The results of this research have been compiled into the M.I.T. database of militarily useful, EUSC tankers for June 2002 as shown in Table 5.2. Appendix D contains the January 2002 MARAD database for EUSC, militarily useful tankers and the explanation of how the current database was derived from the

M.I.T. EUSC, Militarily Useful Tankers – Listing by Operator					
Ship Name	Vessel Owner/Operator	Built	DWT (LT)	Speed (knots)	Hull
Alcoa Steamship Co. Inc.					
MARLIN	Alcoa Steamship Co. Inc.	1977	15,000	13	DB
TARPON	Alcoa Steamship Co. Inc.	1977	15,000	13.5	DB
ChevronTexaco Shipping Co.					
CHARLES B. RENFREW	Chevron Transportation Corp.	1988	78,656	14	SH
R. HAL DEAN	Chevron Transportation Corp.	1988	78,656	14.8	SH
KENNETH E. HILL	Chevron Corp.	1979	81,273	15.1	SH
CHEVRON ZENITH	Chevron International Ltd.	1972	96,716	15.5	SH
Conoco Shipping Co.					
CONTINENTAL	Conoco Shipping Co.	1993	98,231	14.9	DH
GUARDIAN	Conoco Shipping Co.	1992	96,920	14.8	DH
PATRIOT	Conoco Shipping Co.	1992	96,920	14.9	DH
PIONEER	Conoco Shipping Co.	1993	96,724	14.9	DH
ExxonMobil Corporation					
PALM BEACH	Esso Petrolera Argentina SRL	1978	50,801	16.3	SH
RIO GRANDE	Esso Petrolera Argentina SRL	1982	15,450	12.5	SH
BAYWAY	Esso Petrolera Argentina SRL	1978	50,915	16.2	SH
El Paso Marine Co.					
ARUBA	El Paso Corporation	1980	69,118	15	DS
OSG Ship Management, Inc.					
DELPHINA	Overseas Shipholding Group	1989	39,674	14	DS
DIANE	Overseas Shipholding Group	1987	64,140	14	DS
LUCY	Overseas Shipholding Group	1986	64,000	14	DS
MARY ANN	Overseas Shipholding Group	1986	64,239	14	DS
NEPTUNE	Overseas Shipholding Group	1989	39,800	14	DS
SUZANNE	Overseas Shipholding Group	1986	64,000	14	DS
URANUS	Overseas Shipholding Group	1988	39,171	14	DS
VEGA	Overseas Shipholding Group	1989	39,674	14	DS
ANIA	Overseas Shipholding Group	1994	94,847	14.5	DH
BERYL	Overseas Shipholding Group	1994	94,799	14	DH
ELIANE	Overseas Shipholding Group	1994	94,813	14.5	DH
PACIFIC RUBY	Overseas Shipholding Group	1994	84,999	15.5	DH
PACIFIC SAPPHIRE	Overseas Shipholding Group	1994	96,173	15.5	DH
REBECCA	Overseas Shipholding Group	1994	94,872	14.5	DH
VENUS V	Overseas Shipholding Group	1981	79,999	14.7	SH/SBT
VESTA	Overseas Shipholding Group	1980	81,278	14.7	SH/SBT
COMPASS 1	Overseas Shipholding Group	1992	95,544	14	DS
V Ships USA, Inc. (Florida)					
CLEMENT	PLM International	1976	59,650	16	SH

Note: 1. DS – Double Sided; DB – Double Bottomed; DH – Double Hulled; SH – Single Hulled; SBT – Segregated Ballast Tanks

2. Esso Petrolera Argentina SRL (Sociedad de Responsabilidad Limitada) new name for Esso SAPA (Sociedad Anonima Petrolera Argentin)

Source: Appendix E

Table 5.2, M.I.T. EUSC, Militarily Useful Tanker Fleet for June 2002

MARAD Database. Appendix E contains a more detailed version of the M.I.T. database summarized in Table 5.2. The breakdown by vessel type for the June 2002, EUSC fleet is presented in Table 5.3.

	Vessel Type					
	CPP < 80,000 dwt	CPP > 80,000 dwt	Crude Carriers	Chemical Carriers	OBOs	Total Fleet
Number	15	4	11	0	2	32
Coated Tanks	9	1	5	0	0	15
Double Hull	0	4	6	0	0	10

Note: CPP = Clean Petroleum Product Carriers; OBO = Oil/Bulk/Ore Carriers
Source: Appendix E

Table 5.3, Breakdown of the M.I.T. EUSC, MU Tanker Fleet for June 2002

The M.I.T. database of June 2002 contains a total of 32 vessels with a combined dwt of 2,264,078 as described in Appendix E. MARAD is in agreement with this M.I.T. database. Of the vessels in the M.I.T. database, fifteen had fully coated tanks and ten had double hulls. The most valuable vessels according to the MRS-05 study are smaller product tankers with fully coated cargo tanks because of their greater operational flexibility and their ability to carry all fuel products. In the current fleet, the category for clean petroleum product carriers under 80,000 dwt included only fifteen vessels of which nine had fully coated tanks. None of the vessels in this category had double hulls.

The effort to compile this database has resulted in some other important characteristics regarding the EUSC, militarily useful tanker fleet. The MARAD databases for 2001 and 2002 listed thirteen and fourteen operating companies, respectively. The M.I.T. database for June 2002 contains only seven operating companies. Within this militarily useful database, one owner/operator, Overseas Shipholding Group, provides 56% of the fleet by

dwt. The three largest owner/operators in our database, OSG, ChevronTexaco, and Conoco, Inc., provide 88% of the EUSC, militarily useful tanker fleet for 2002 by dwt.

The initial analysis is based upon the M.I.T. database of militarily useful, EUSC tankers for June 2002 presented in Table 5.2. This analysis was done to show the available capacity of this fleet for June 2002 under the most optimistic circumstances. In this phase, all vessels in the database were used regardless of the presence of coated or uncoated tanks. In addition, all vessels are employed in the inter-regional tanker sealift role. This decision was based upon the standards for intra-regional tankers found in the MRS-05 study. Three vessels, the Alcoa Steamship OBOs and the Esso Petrolera Argentina SRL product carrier, *Rio Grande*, in the database have a dwt less than 20,000. However, the Alcoa vessels are primarily ore carriers and all three vessels have ageing, uncoated cargo tanks. It is assumed that these vessels would not be selected for this role. The final simplification is the assumption that all tankers carry the same type of fuel. No distinction is made between vessels carrying JP-8, JP-5 or F-76.

In order to determine the capacity of the fleet on a monthly basis, the number of voyages per month completed by each vessel within the fleet had to be calculated using a spreadsheet model. Calculating the voyages per month required the speed, the loading rate, and pump out rate of each vessel. The loading and pump out rates for these vessels were obtained from the 2001 version of the Clarkson Registry. When these rates were unavailable for certain vessels, this information was estimated using the data for similarly sized vessels of the same type.

In practice, cleaning time may be required to prepare a ship for the carriage of military fuel products. This period can range from 0 to 18 days depending upon the type of cargo carried on the previous voyage according to the MRS-05 study. For the present analysis, initial delays were deemed extraneous, and all cleaning times were set to zero days. These assumptions will result in underestimating the number of vessels needed. With the information cited above, the total time required per voyage and the voyages completed per month for each vessel could be calculated. Using the voyages per month and cargo capacity of each vessel, the total amount of fuel delivered by the fleet in a given month was determined. The capacity, for a distance to theater of 3,000 miles, of the militarily useful, EUSC tanker fleet on both a barrels delivered per month and a ton-miles achieved per month basis is presented in Table 5.4.

	Characteristics & Capacities			
	# of Vessels	Total DWT	Mbbls/month	Ton-miles/month
Militarily Useful, EUSC Tanker Fleet	32	2,264,078	24,695	10,434,602

Source: Appendix F

Table 5.4, Size & Capacity of the M.I.T. Militarily Useful, EUSC Tanker Fleet for June 2002

The capacity analysis used for the applicable EUSC fleet in June 2002 forms the basic model for generating forecasts of this fleet for years beyond 2002. In the next phase of this analysis, some tankers within the EUSC fleet were removed from the database under both the OPA 90 and MARPOL 13/G standards for the phasing out of single-hull tankers. Where information is available, vessels on order by companies that currently possess vessels within the EUSC fleet were added to the database. Following the incorporation

of these additions and deductions into the database, the fleet's capacity was determined for January 1, 2006, January 1, 2011, and January 1, 2016. These dates correspond to important deadlines within the phase out regulations.

Double Hull Legislation

There are two forms of double hull tanker regulations that are beginning to affect the global tanker industry. These new regulations are the Oil Pollution Act of 1990 (OPA 90) enacted by the U.S. Congress and MARPOL Regulation 13/G (Revised) approved by the International Maritime Organization in April 2001. Both forms of the double hull legislation restrict all single hulled, double sided, and double bottom tankers from trading past certain deadlines. After these deadlines, only double-hulled tankers will be allowed to operate in the ports of nations that have adopted these regulations. Although similar in intent, the phase out schedules of non-double hulled vessels under these acts do differ.

Year of Double Hull Compliance	Size of Vessel					
	5,000 to 14,999 GT		15,000 to 29,999 GT		30,000 GT or more	
	Single Hull	DS or DB	Single Hull	DS or DB	Single Hull	DS or DB
2001	35	40	29	34	23	28
2002	35	40	28	33	23	28
2003	35	40	27	32	23	28
2004	35	40	26	31	23	28
2005	35	40	25	30	23	28
2006	25	30	25	30	23	28
2007	25	30	25	30	23	28
2008	25	30	25	30	23	28
2009	25	30	25	30	23	28
2010	25	30	25	30	23	28
2011		30		30		28
2012		30		30		28
2013		30		30		28
2014		30		30		28
2015		30		30		28
Note: Vessels of ages shown or older must be phased out.						

Source: National Research Council, Double-Hull Tanker Legislation: An Assessment of the Oil Pollution Act of 1990, National Academy Press, Washington, D.C., 1998.

Table 5.5, OPA 90 Phase Out Schedule for 2001 through 2015

OPA 90 began to affect vessels trading in U.S. waters starting in 1995. Table 5.5 presents the phase out schedule for all vessels to be removed under OPA 90 for 2001 through 2015. After 2010, all single hulled vessels must be phased out regardless of vessel age. After 2015, all single hull, double sided, or double bottomed vessels are prohibited from the carriage of all petroleum products within U.S. waters regardless of vessel age.

The MARPOL 13/G (Revised) regulation does not begin to affect vessels operating outside of U.S. waters until 2003. The phase out schedule of this regulation is divided into three categories. These categories are further divided based upon the deadweight of the vessel and the type of petroleum product carried. Table 5.6 presents the phase out schedule under MARPOL 13/G (Revised). For Category 1 through 3, a vessel must be removed from service by the start of its 26th year of operation. All Category 2 and 3

Category	Type	DWT	Cargo	Phase Out
1	Pre PL/SBT Pre-1981	> 20k	Crude and Dirty Oil	2003 – 2007
		> 30k	Other than Crude/Dirty	
2	PL/SBT Pre-1996	> 20k	Crude and Dirty Oil	2003 – 2015
		> 30k	Other than Crude/Dirty	
3	Oil Tanker	5k < dwt < 20k	Crude and Dirty Oil	2003 - 2015
		5k < dwt < 30k	Other than Crude/Dirty	

Note: PL/SBT refers to Protectively Loaded Segregated Ballast Tank regulations.
Source: National Research Council, Double-Hull Tanker Legislation: An Assessment of the Oil Pollution Act of 1990, National Academy Press, Washington, D.C., 1998.

Table 5.6, MARPOL 13/G (Revised) Phase Out Schedule

vessels must be removed from service by 2015 regardless of vessel age. Unlike the OPA-90 legislation, the MARPOL 13/G (Revised) regulation does not affect any chemical carrier involved exclusively in the carriage of chemicals. It should be noted that none ofthe vessels in M.I.T.'s EUSC, militarily useful database for June 2002 operate exclusively as chemical carriers. Category 1 and 2 vessels are also subject to a Condition Assessment Scheme (CAS), which is performed in 2005 for Category 1 vessels and in 2010 for Category 2 vessels. The failure of a CAS results in the early retirement of a subject vessel. In the present analyses, all Category 1 and 2 vessels were assumed to pass the CAS.

EUSC Fleet Projections

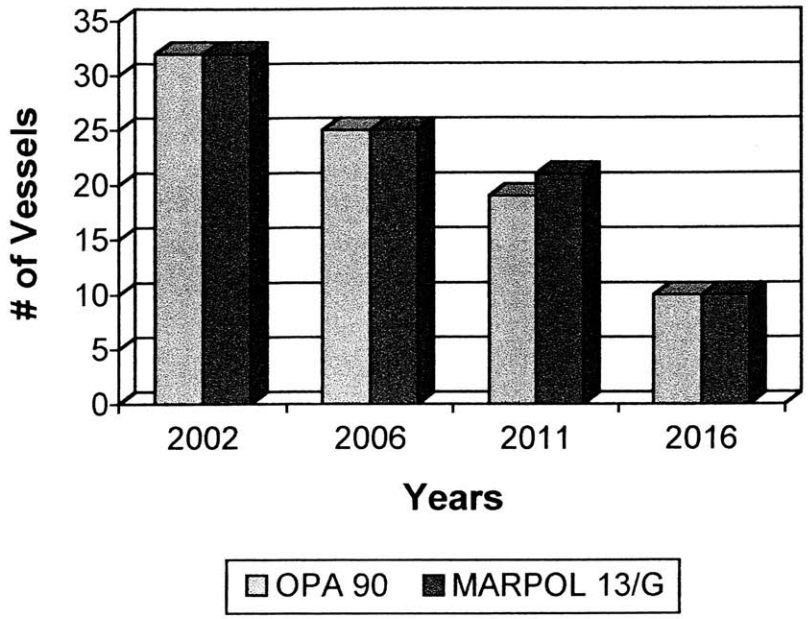
Based upon the phase out schedules described in the previous section, the M.I.T. database used in the analysis of the applicable EUSC fleet in 2002 was modified to indicate the availability of each vessel at the start of 2006, 2011, and 2016. The modified database was then duplicated for each single-hulled tanker phase out schedule and for each year under consideration to form a total of six separate databases (three for OPA 90 and three for MARPOL 13/G). Within each database, vessels that were unavailable for the year of the database using the applicable phase out schedule were removed.

New vessels under construction for companies currently operating vessels within the EUSC fleet were investigated using Fairplay Solutions for April 2002 and through discussions with current owners and operators within this fleet. Currently, none of these companies have militarily useful tankers on order. The uncertainty surrounding

newbuildings over the next thirteen years will be dealt with in a later section. With each database corrected for pending additions and deletions, the projected fleet size and capacity could be determined for the start of 2006, 2011, and 2016 under both phase out schedules. The results are included as Appendix F. The projections for number of vessels, total deadweight of the fleet, barrels delivered per month delivered, and ton-miles achieved per month are displayed in Figure 5.1, Figure 5.2, Figure 5.3, and Figure 5.4, respectively, for 2002 through the end of 2015. It is important to note that only vessels affected by single-hulled tanker phase out schedules have been removed from the database. Projected sales or scrappings as a result of vessel age have not been included. The oldest double-hulled EUSC, militarily useful tanker in the database would be 19 years old in 2011 and 24 years of age in 2016.

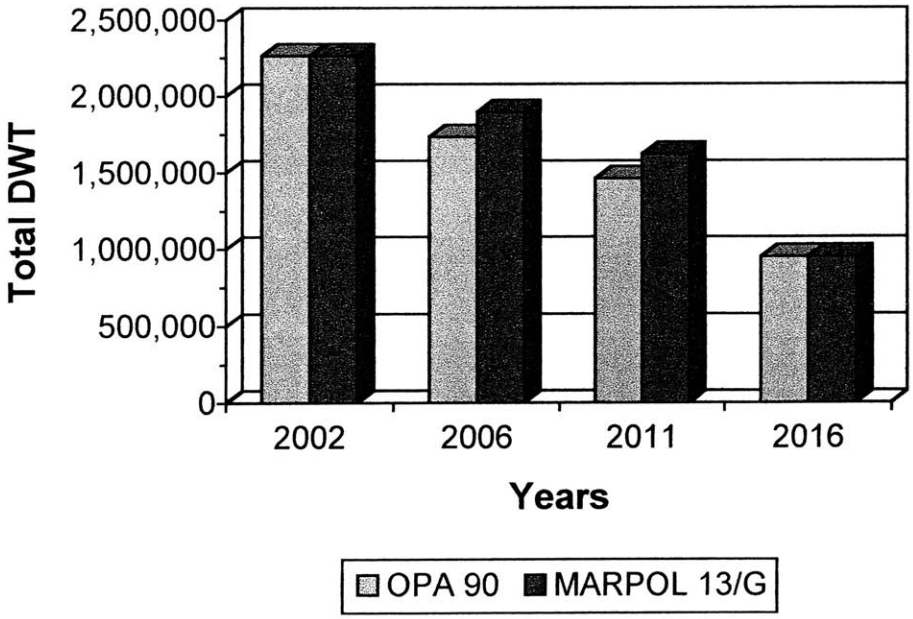
The results presented in Figure 5.1 through 5.4 indicate that the OPA 90 regulations impose a more accelerated phase out schedule on the militarily useful, EUSC tanker fleet than the MARPOL 13/G schedule.[11] By 2016, the fleet projections are identical. This result holds only for the vessel database under consideration because vessels exclusively utilized as chemical carriers do not require phase out under MARPOL 13/G. As the June 2002 database contains no pure chemical carriers, the results are identical for January 1, 2016. Both phase out methods result in a 69 percent reduction in the total number of tankers and a 56 percent drop in delivered capacity by the start of 2016. As the applications of the OPA-90 and MARPOL 13/G (Revised) regulations result in roughly the same rate of decline in the size of the EUSC, militarily useful tanker fleet, the OPA-

[11] Note that identical fleet sizes in 2006 do not result in identical capacities for that year. While the fleet sizes match, the list of remaining vessels differ because of differences in the OPA-90 and MARPOL 13/G (Revised) regulations.



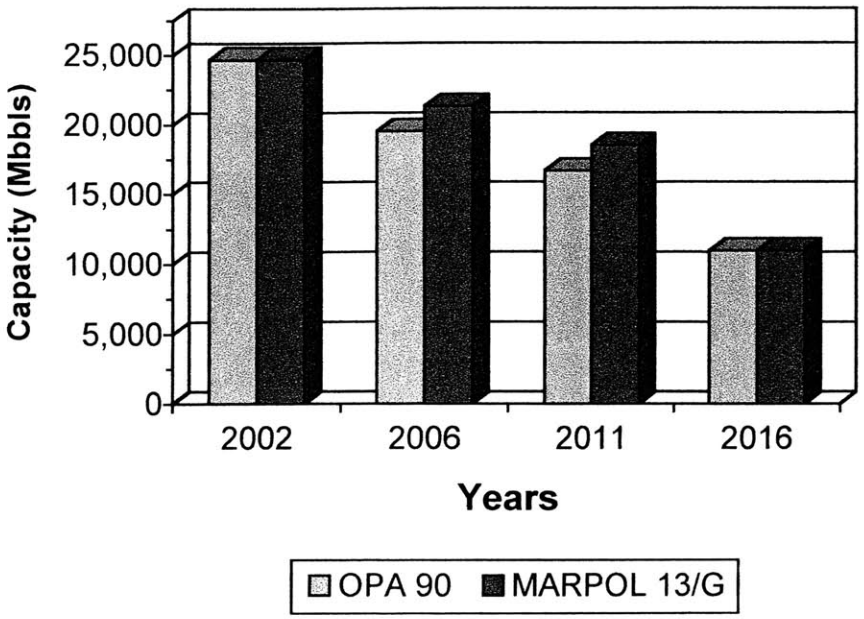
Source: Appendix F

Figure 5.1, Forecast of # of Vessels in Militarily Useful, EUSC Tanker Fleet



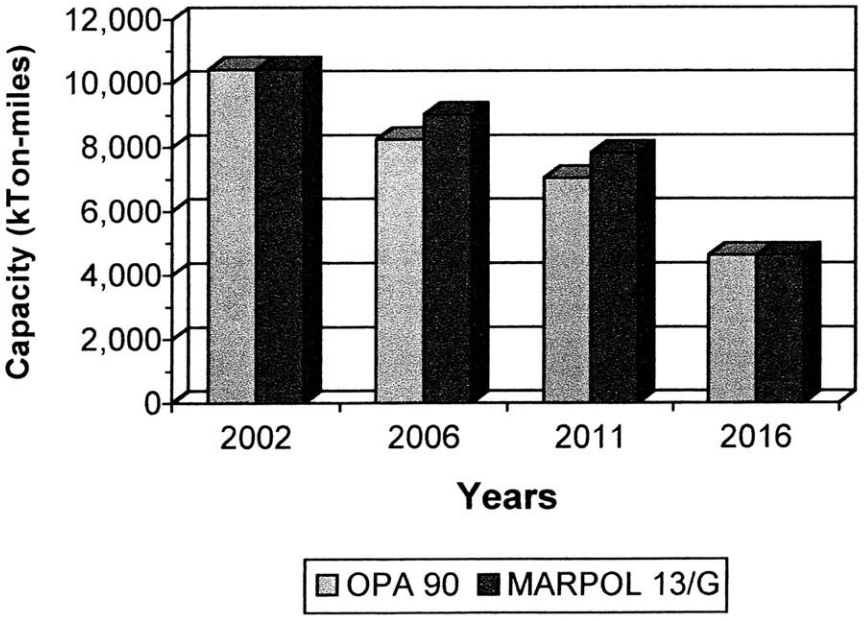
Source: Appendix F

Figure 5.2, Forecast of Total DWT of Militarily Useful, EUSC Tanker Fleet



Source: Appendix F

Figure 5.3, Forecast of Barrels Delivered per Month by Militarily Useful, EUSC Tanker Fleet



Source: Appendix F

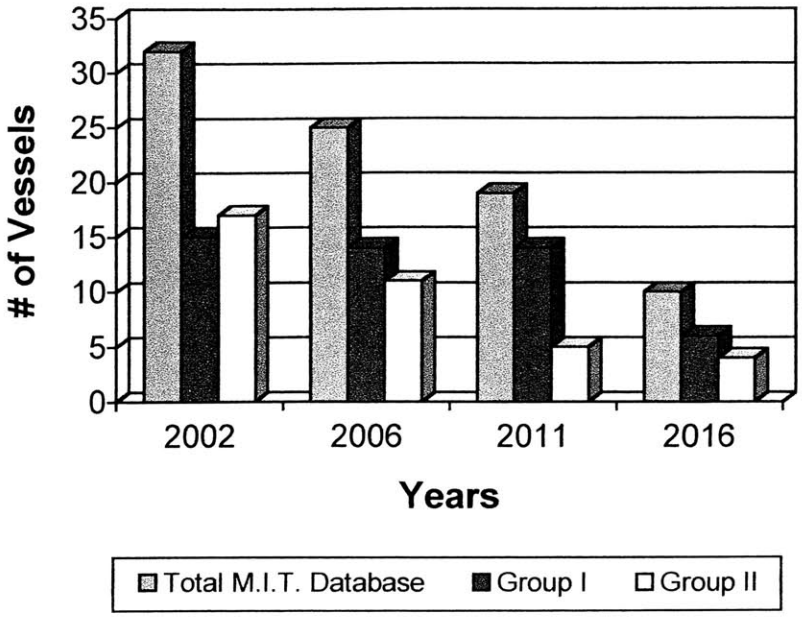
Figure 5.4, Forecast of Ton-miles Attained per Month by Militarily Useful, EUSC Tanker Fleet

90 regulations will be used to establish the availability of tankers in future years for all remaining fleet size projections in this report.

EUSC Fleet Projections - Cargo Tank Coatings

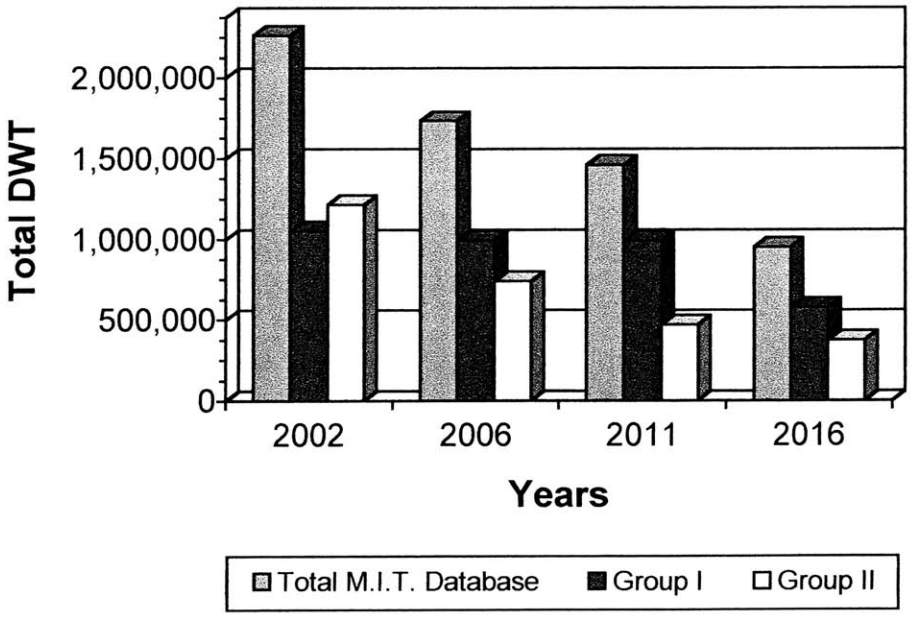
The importance of tank coatings was established in the discussion of the MRS-05 report. Military planners prefer vessels with fully coated tanks because these vessels are able to carry all fuel products without the danger of contamination. The time required to clean coated cargo tanks when switching from crude oil to petroleum products is also reduced. The MRS-05 study considers uncoated tankers a backup source in the event that coated tankers are inadequate to meet sealift needs. The use of uncoated tankers and cleaning requirements are discussed more in Chapter 6.

In this section, the fleet information obtained from the previous EUSC fleet projections will be broken down into groups based upon a vessel's cargo tank coatings. Group I will include only vessels with fully coated tanks. Group II will include vessels with partially coated or uncoated tanks. The breakdown of the projections for the EUSC, militarily useful fleet for 2002 through 2016 are presented in Figures 5.5, 5.6, 5.7, and 5.8. See Appendix F. It is quickly apparent that less than half of the available EUSC militarily useful tankers possess coated tanks. The figures also indicate that the Group I portion of the fleet will remain stable until after 2010. The large drop in Group I tankers between the end of 2010 and the end of 2015 is the result of the phase out of eight of OSG's double-sided product tankers. The Group II fleet demonstrates steady decline over the next thirteen years. While the fleet will contain ten double hull tankers in 2016, only six



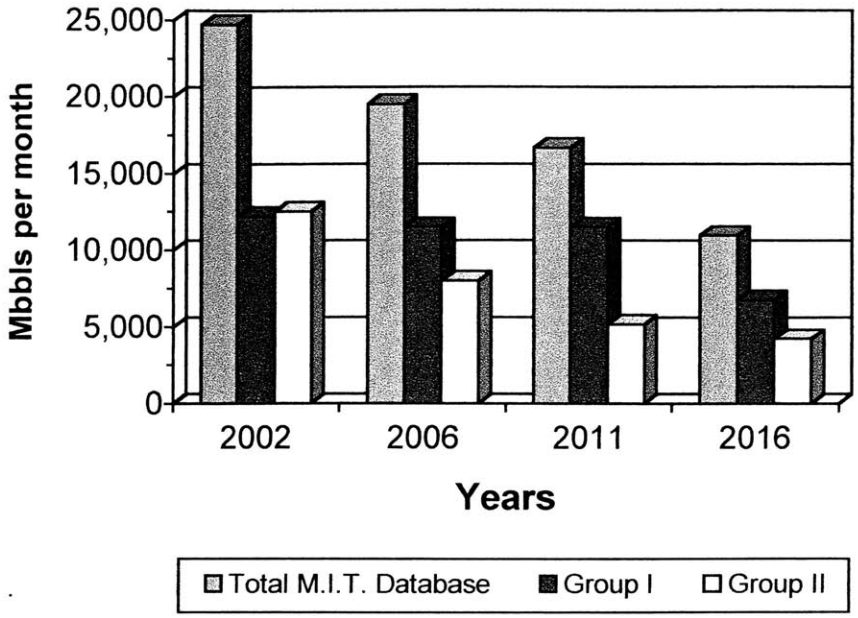
Source: Appendix F

Figure 5.5, Breakdown of Forecast of Militarily Useful, EUSC Tanker Fleet by Tank Coatings - # of Vessels



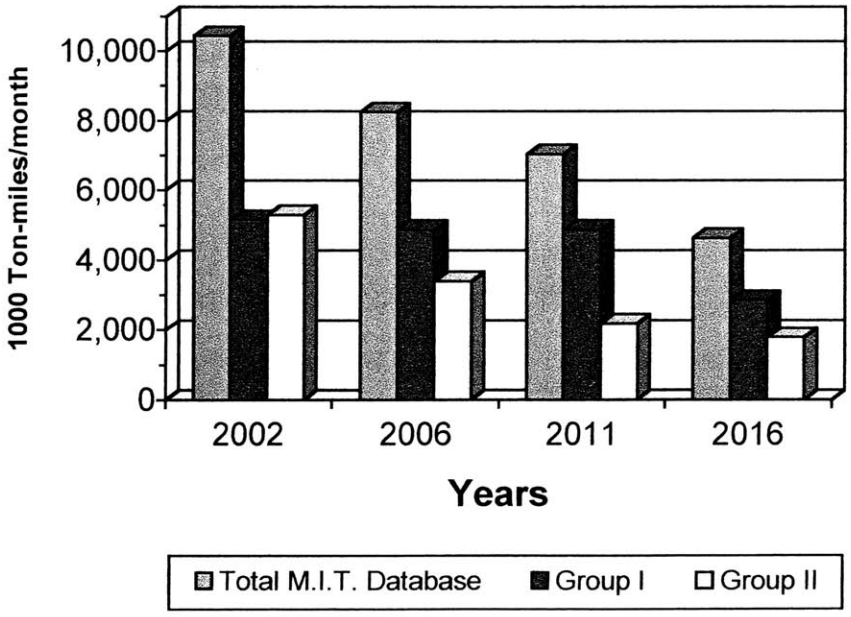
Source: Appendix F

Figure 5.6, Breakdown of Forecast of Militarily Useful, EUSC Tanker Fleet by Tank Coatings – Total DWT



Source: Appendix F

Figure 5.7, Breakdown of Forecast of Militarily Useful, EUSC Tanker Fleet by Tank Coatings – Barrels Delivered per Month



Source: Appendix F

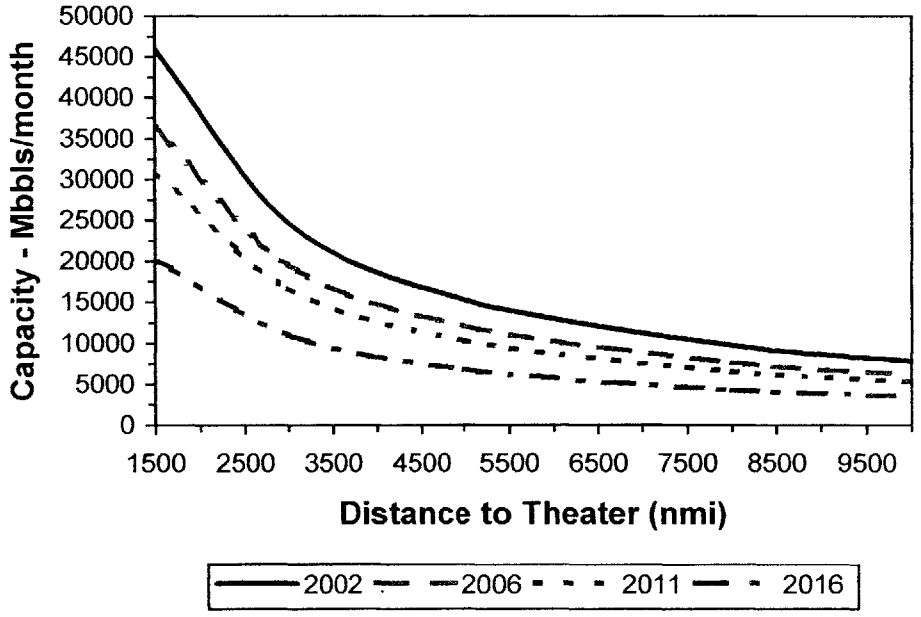
Figure 5.8, Breakdown of Forecast of Militarily Useful, EUSC Tanker Fleet by Tank Coatings – Ton-miles Achieved per Month

of these will have the coated cargo tanks most desired by military planners. In addition, these remaining tankers with coated cargo tanks will all possess a dwt between 85,000 and 98,200, which is approaching the upper limits of military usefulness.

EUSC Fleet Projections – Distance to Theater

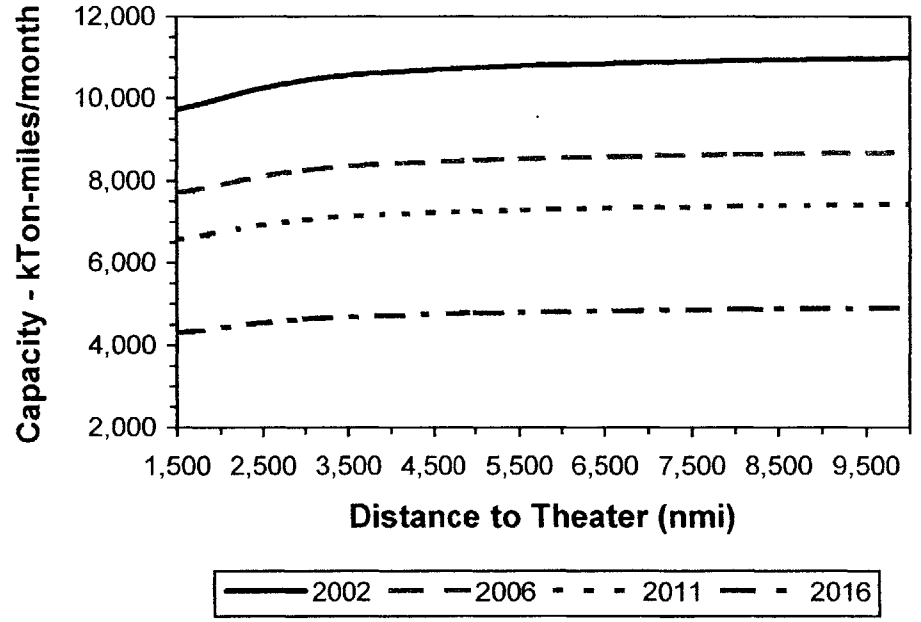
In the previous analyses, the distance from the fuel supplier regions to the theater of war was assumed to be 3,000 miles, or a 6,000-mile roundtrip. The 3,000-mile assumption was an average value suitable when using supply regions outside the U.S. However, there may be war situations where the fuel products must be obtained from the mainland U.S. This consideration prompted the following investigation of the effect of varying the distance to theater on the capabilities of the EUSC, militarily useful tanker fleet. Varying the distance to theater will have no effect on the size of the EUSC fleet. However, it will affect the delivered capacity on both a barrels per month and ton-miles per month bases. This analysis will use the same database and methodology used in the previous cases. It should be noted that all EUSC, militarily useful tankers are used regardless of the presence of cargo tank coatings.

In this analysis, the distance to theater was varied between 1,500 miles and 10,000 miles. These extreme values are simply used as the upper and lower bounds of this analysis. All likely distances between military fuel supplier and consumer regions should fall between these bounds. In a scenario where the U.S. West Coast is used as a supplier region for a conflict on the Korean Peninsula, the distance to theater is approximately 5,000 miles. In the case that the U.S. Gulf Coast supplies the fuel for a conflict in Southwest Asia, the



Source: Appendix G

Figure 5.9, Effect of Varying Distance to Theater on Capacity of Militarily Useful, EUSC Tanker Fleet – Barrels Delivered per Month



Source: Appendix G

Figure 5.10, Effect of Varying Distance to Theater on Capacity of Militarily Useful, EUSC Tanker Fleet – Ton-miles Achieved per Month

distance to theater is around 8,000 miles, assuming the Florida Straits and the Suez Canal are used. The results of this investigation are contained in Appendix G. Figures 5.9 and 5.10 display the effects of varying the distance to theater on the capacity of the EUSC, militarily useful fleet. Figure 5.9 can be used to find the fleet's delivered barrels per month for all forecast years at any distance to theater. Figure 5.10 provides the fleet's capacity on a ton-miles achieved per month basis for all forecast years and at any distance to theater.

Altering the distance to theater was found to have a significant, non-linear effect on the barrels of fuel delivered per month for all years. The effect of varying distance was most pronounced between 1,500 and 5,000 nautical miles. For the 2002 fleet, increasing the distance from 3,000 to 5,000 nautical miles reduced the delivered barrels per month by 38 percent. For this same year, increasing the distance from 3,000 to 8,000 miles results in a 61 percent reduction in delivered barrels per month. For all forecast years, an identical increase in the mileage resulted in the same percentage reduction in delivered capacity per month.

The results for ton-miles achieved per month also require some consideration. As the distance to theater increases, the ton-miles achieved also rises, especially between 1,500 miles and 3,500 nautical miles. This trend is the result of the vessels spending proportionally more time at sea and less time in port as the distance to theater rises. While the fleet's efficiency may rise as the distance is increased, the more significant

result for military planners is the substantial decrease in the amount of fuel delivered per month as distance to theater increases.

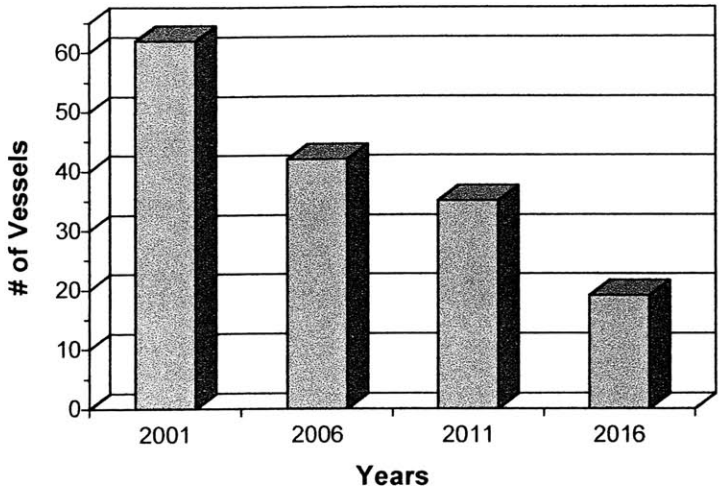
CAPACITY OF THE PRIVATELY OWNED, U.S. FLAG TANKER FLEET

As the vast majority of U.S. flag tankers trade between American ports only or between foreign ports and the United States, only the OPA 90 regulations were used in projecting the militarily useful, U.S. flag tanker fleet after 2001. Projections of the future fleet size and capacity were made based upon the U.S. flag tanker fleet database for 2001 created from a U.S. Coast Guard database in Chapter 2. Unlike the EUSC projections, these forecasts do not provide a delivered capacity for a given distance to a theater of war. Projection databases were created for 1/2006, 1/2011, and 1/2016 using the phaseout date for each tank vessel provided by the U.S. Coast Guard.

Many current owners of single hulled tank vessels in the U.S. flag fleet have been slow to replace vessels scheduled for phasing out by OPA 90. Uncertainty about the volume of seaborne trade in the future domestic market, the high costs of building new vessels in U.S. shipyards, the strength of competitors, such as pipelines and direct foreign imports, and the future price levels of crude oil and petroleum products are the major concerns of domestic owners of tank vessels. Information on new, militarily useful tonnage to be built for the U.S. flag tanker fleet was obtained from Marine Log for November 2001, from Marine Log for April 2002, and from the OPA 90 listing by the USCG. As of

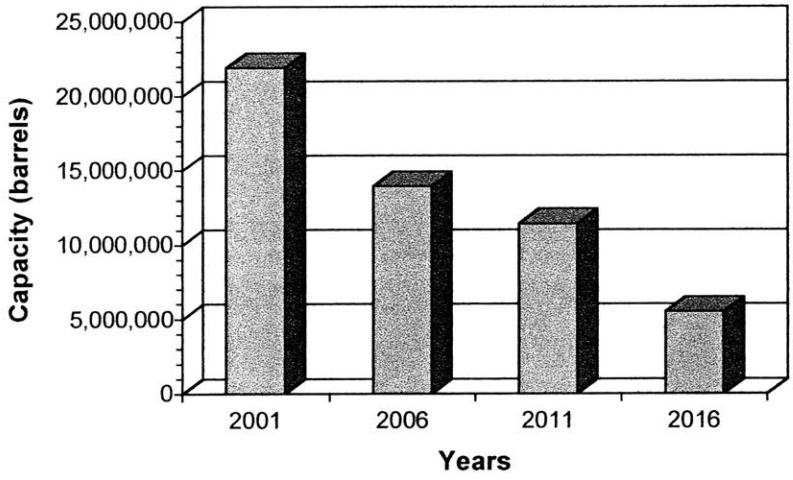
April 2002, there were pending orders for ten 40,000 dwt product tankers and one chemical tanker in U.S. shipyards. However, all of these pending contracts were dependent on receiving Title XI loan guarantees from MARAD. The current Title XI funding levels have resulted in a significant waiting list of owners. In fact, the letter of intent for four of these product tankers has expired. While there are currently no confirmed orders for double hulled product tankers, several double hulled tank-barge combination vessels are on order. Other Jones Act operators are bringing their fleets into compliance by converting single hull barges into double hulled barges. If present newbuilding and conversion trends hold over the next few years, then product tankers scheduled for phase out will be replaced with double-hulled combination tug-barges. As discussed in Chapter 2, combination tug-barges are not considered militarily useful for inter-regional sealift because of their slow speed and their reduced seakeeping ability. Therefore, no new vessels were added to the databases for 2006, 2011, and 2016.

With the projection databases updated for additions and deletions, the forecasts of the number of vessels and of the capacity of the military useful, U.S. flag tanker fleet could be generated. The results are included in Appendix H. These forecasts for 2001 through the end of 2015 are presented in Figure 5.11 and Figure 5.12. It should be noted that the



Source: Appendix H

Figure 5.11, Projected Militarily Useful, U.S. Flag Tank Vessel Fleet - # of Vessels



Source: Appendix H

Figure 5.12, Projected Militarily Useful U.S. Flag Tank Vessel Fleet– Total Capacity

decline shown in fleet capacity in Figures 5.11 and 5.12 over the next 13 years is a projection of the available militarily useful tankers based upon current trends. It is not a forecast of the decline of the U.S. flag tank vessel fleet as a whole.

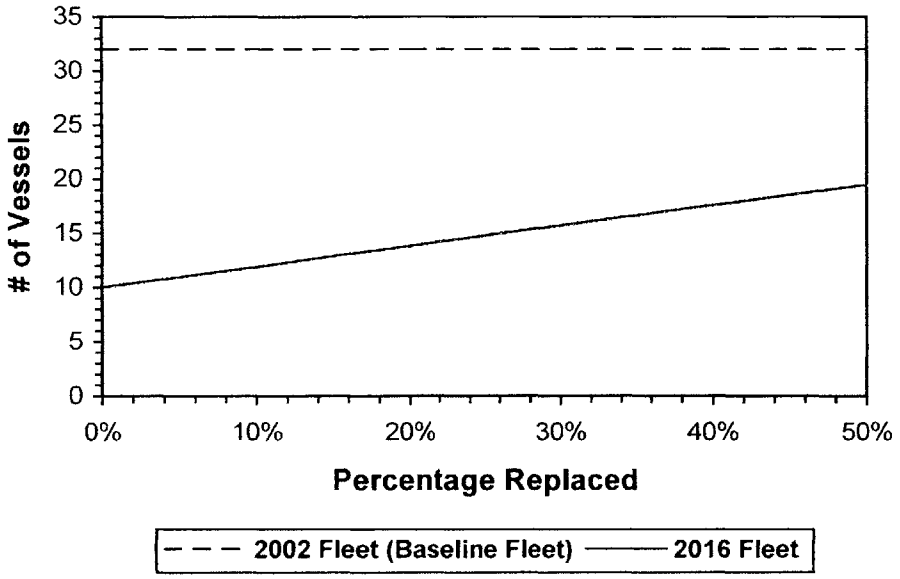
These forecasts provide useful insight into the future makeup of the U.S. flag, militarily useful tanker fleet. A comparison of Figures 5.11 and 5.12 reveals that both the total number of vessels and the fleet's capacity are expected to decline in two stages. The periods of greatest decline should take place between 2001 and 2006 and between 2011 and 2016. It is possible that total fleet capacity will decline by as much as 36 percent by 2006. By the start of 2011, the fleet's capacity could drop by as much as 48 percent compared to 2001.

UNCERTAINTY IN THE FORECASTS OF THE EUSC FLEET

The previous sections provided projections for both the militarily useful, EUSC tanker fleet and the militarily useful, U.S. flag tanker fleet through the end of 2015. A degree of uncertainty surrounds both forecasts. It was previously mentioned that there were presently no militarily useful newbuildings planned by U.S. owners in the current EUSC tanker database. Therefore, no newbuildings were presumed to enter the fleet over the next thirteen years. Although the general prediction of a reduction in the size and capacity of both fleets is reinforced by a history of decline and by the current rates of newbuildings, changes in government policies or in market conditions could greatly affect the status of these fleets in future years. Such changes are difficult to predict and would produce additional uncertainty in the present analyses. However, the effect of adding in new tonnage between 2002 and January 2016 can be examined.

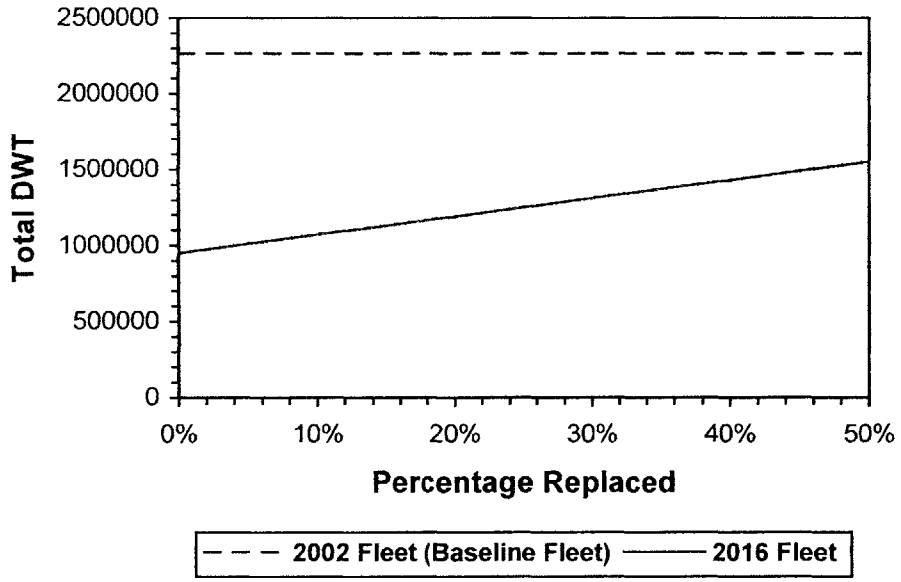
If the OPA-90 and MARPOl 13/G regulations were not in place, some vessels in the EUSC military useful tanker fleet would still be scrapped or sold to other companies over the next thirteen years. It is unreasonable in the face of the steady decline of the U.S. owned, foreign flag fleet since the 1970's to expect that the remaining companies with EUSC tankers will add to their fleets beyond their 2002 total. It is reasonable to assume, however, that some phased out vessels will be replaced. In all of the previous analyses, no vessels were added over the next thirteen years because there are currently no EUSC, militarily useful tankers on order. So, the lower bound of this analysis is the assumption that no phased out tonnage may be replaced between 2002 and 2016. The upper bound on this analysis will be assumed to be 50% of phased out tankers and 50% of the retired tonnage. The actual value of tonnage and vessel replacement can reasonably be expected to lie between these limits.

For this analysis, all tankers, regardless of tank coating type, were used. The distance to theater was assumed to be 3,000 miles. For the year 2016, the percentage of the total retired vessels over the past thirteen years that is added back in 2016 was varied from 0% to 50%. The average dwt of these new vessels is found by dividing the total retired dwt for 2002 to 2016 by the number of retired vessels. The pump out rate is assumed to be 6000-metric tons/hr, and the oil capacity is approximated as 7.1 barrels per LT of deadweight. The results are included in Appendix I. Figure 5.13 displays the effect of altering the percentage of replaced vessels on the number of vessels in the fleet. Figure 5.14 and 5.15 demonstrate the effect of varying the percentage of vessels replaced after



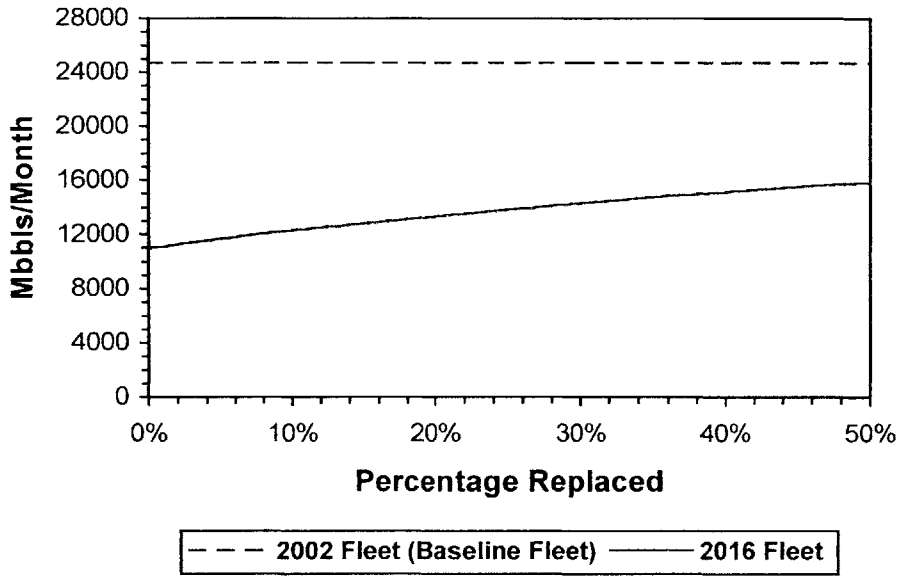
Source: Appendix I

Figure 5.13, Effect of Replacing Phased Out Tankers on the Militarily Useful, EUSC Tanker Fleet - # of Vessels



Source: Appendix I

Figure 5.14, Effect of Replacing Phased Out Tankers on the Militarily Useful, EUSC Tanker Fleet – Total DWT of Fleet



Source: Appendix I

Figure 5.15, Effect of Replacing Phased Out Tankers on the Militarily Useful, EUSC Tanker Fleet – Barrels Delivered per Month

phase out on the total dwt of the fleet and on the delivered capacity in barrels per month, respectively. The horizontal line, labeled "2002 Fleet (Baseline Fleet)", in these figures provides the value for the fleet in June 2002 for comparison purposes.

The linear effect of altering the percentage of retired vessels that are replaced is expected. These figures provide a way of approximately adjusting the forecasts provided in this report for any reasonable level of vessel replacement within the next thirteen years. The important insight gained from these figures is that, even under the most optimistic expectations of EUSC, militarily useful tanker replacement for 2002 to 2016, the number of vessels, the total dwt, and the deliverable capacity of the fleet will still fall by around 39%, 32%, and 36%, respectively.

A LINK BETWEEN THE EUSC & U.S. FLAG FLEETS

One additional point should be made regarding the companies that currently own EUSC, militarily useful tankers vessels in M.I.T.'s database for June 2002. A majority of these companies, including Overseas Shipholding Group, ChevronTexaco, ExxonMobil, and Conoco (pending a successful proposed merger of Conoco and Phillips), own vessels in both the EUSC fleet and the U.S. flag merchant fleet. This group of companies also represents some of the largest owners of vessels in both fleets. Therefore, the futures of the militarily useful portions of the EUSC tanker fleet and the U.S. flag merchant fleet are linked. As such, favorable alterations in U.S. tax policy regarding the income from foreign flag vessels received by U.S. owners would also benefit many of the companies that sustain the U.S. flag merchant fleet.

PROJECTED STRATEGIC SEALIFT SOURCES

In Chapter 2, Table 2.7, the total strategic sealift sources available to the Department of Defense in 1990 and 2001 were compared. Using a 2005 projection for the MSC fleet and RRF from the MRS-05 study and the forecasts for the EUSC and U.S. flag fleets generated in our report, the projected total strategic sealift sources of the DoD can be estimated through the end of 2015. The projections included for the EUSC fleet used the OPA 90 phase out schedule. Table 5.7 summarizes the pool of vessels by source for June 2002, 2006, 2011, and 2016.

The numbers behind these projections require some consideration. For instance, the MSC fleet and RRF are assumed to remain constant after 2006. The average age of the vessels in the RRF was 40.1 years in 2001. Many of these vessels could be scrapped

	Militarily Useful Tankers			
	2002	1/2006	1/2011	1/2016
Military Sealift Command[1]	6	5	5	5
Ready Reserve Force[1]	9	10	10	10
U.S. Flag Merchant Vessels[3]	61	42	35	19
Effective U.S. Control Fleet[2]	32	25	19	10
Total	108	82	69	44

Source: 1) Joint Staff/OSD, Department of Defense, "MRS-05 Tanker Sealift Analysis" (Unclassified Version), U.S. Department of Defense, 2001.
2) Appendix F
3) Appendix H

Table 5.7, Projections of U.S. Strategic Tanker Sealift Resources, 2001 - 2016

during the next 15 years. In addition, it should be noted that vessels on MSC charter may be committed to other daily duties that preclude them from participating in a continuous tanker sealift role. For some RRF vessels, other commitments, such as to the OPDS fleet, may prevent them from working as inter-regional sealift vessels.

For 2005, the MRS-05 study identified 110 tankers with coated and uncoated tanks for inter-regional tanker sealift from a total pool of 127 tankers. The remaining 17 tankers were utilized for intra-regional sealift. From the pool of inter-regional tankers, the 87 tankers with coated cargo tanks were considered the baseline fleet for all scenarios using the limited HNS assumption discussed in an earlier section. This fleet was inadequate, in terms of MOEs, for a few high demand sealift scenarios. One option used to meet the

terms of the MOEs was the Added Ship case where 107 tankers, including 20 tankers with uncoated tanks, were used. These 107 tankers were adequate for all scenarios except for the Southwest Asia eastern region scenario where the MOE for avoiding fuel shortfalls during the early stages in this scenario was not met. Another option, defined as Added HNS case, required heavier reliance on Host Nation Support for fuel needs. For this case, the MOEs for all scenarios were met with 78 tankers.

The January 1, 2006 projections in our study identified a total pool of 82 tankers available for all inter-regional and intra-regional needs. The MRS-05 study assumes the withdrawal of seven RRF tankers for use as intra-regional and OPDS tankers, which reduces the available inter-regional tankers to 75 vessels. The potential for a shortfall in available tankers is compounded when the issue of coated versus uncoated tanks is considered. As stated previously, military planners prefer vessels with coated cargo tanks. While the coating status for the vessels in the U.S. flag, RRF, and MSC fleets were not investigated in this study, the coatings of all EUSC, military useful tankers have been investigated. Of the 25 EUSC tankers available in 2006, only fourteen have fully coated cargo tanks. Assuming that inter-regional tankers from all other sources have coated tanks, the coating requirements reduce the pool of the most desirable sealift tankers available to U.S. military planners from 75 to 64 vessels. The assumption that all other sealift tankers have coated tanks results in substantially overestimating the supply of sealift tankers with coated tanks. Table 5.8 compares the total tankers projected by this study to be available in January 2006 to the tanker requirements found by the MRS-05 study.

	M.I.T. Projections of Available Inter-regional Tankers in 1/2006	MRS-05: Sealift Tanker Analysis		
		Preferred Fleet w/ Coated Tanks in 2005	Requirements for Added Ship Case	Requirements for Added HNS Case
# of Militarily Useful Tankers	75 (64)	87	107	78

Note: Value in parentheses indicates the maximum possible number of tankers with coated cargo tanks.

Table 5.8, Comparison of M.I.T. Projections to MRS-05 Study

Even with access to all 75 tankers, U.S. military planners would not have enough vessels to meet the inter-regional tanker sealift requirements of the Added HNS case identified in the MRS-05 study. In addition to the shortfall in the inter-regional tanker sealift effort, using all of these tankers for inter-regional sealift leaves no extra vessels for intra-regional sealift. Therefore, it appears that a shortfall in tanker sealift capacity is likely by January 2006 under the requirements of the MRS-05 report. The shortfall situation is expected to grow even worse by 2011 and 2016.

A final consideration is that withdrawing all available U.S. flag and EUSC militarily useful tankers from commercial service would leave no U.S. controlled tankers under 100,000 dwt to serve the U.S. economy. While the shortfall in supply for the U.S. economy could theoretically be overcome through the chartering of foreign owned tonnage, this approach places U.S. security at greater risk. Therefore, it is a reasonable conclusion to suggest that the sealift and security requirements of the United States are best served by an available pool of U.S. flag and EUSC tankers under 100,000 dwt to serve both needs in time of war.

SUMMARY

1) The most recent study of the tanker sealift needs of U.S. military planners is found in the MRS-05 Sealift Tanker Analysis report. This study used a forecasted fleet of military useful tankers sourced from the Military Sealift Command, the Ready Reserve Fleet, the U.S. flag commercial tanker fleet, and the EUSC fleet to analyze a variety of sealift scenarios. Based on this fleet in 2005, the study concluded that the expected available resources (110 militarily useful tankers) for inter-regional tanker sealift would be adequate to meet a dual theater war situation for all scenarios assuming that tankers with coated and uncoated cargo tanks were utilized and that no vessels were withheld to support the U.S. economy. U.S. military logistics planners would prefer to avoid the use of the 23 tankers with uncoated tanks in all scenarios.
2) The MARAD database for the militarily useful, EUSC tanker fleet in January 2002 was used as the basis for constructing an M.I.T. database for June 2002. The vessels owned by the U.S. companies in this database were investigated in order to confirm their EUSC qualifications and availability as a part of this study. The M.I.T. database contains 32 tankers with a combined dwt of 2,264,078 as opposed to the 63 vessels and 2,996,856 total dwt found in the MARAD database for January 2002. Within the M.I.T. database, Overseas Shipholding Group provides 56 percent of the fleet by dwt. The three largest owner/operators in the M.I.T. database, OSG, ChevronTexaco, and Conoco, Inc., provide 88 percent of the EUSC, militarily useful tanker fleet for 2002 by dwt.
3) The M.I.T. database was used in generating projections of the EUSC militarily useful tanker fleet through the start of 2016. These projections provide estimates of the number of vessels, total DWT, barrels of fuel products delivered per month to a military theater, and the ton-miles of fuel products transported per month of the fleet for 2006, 2011, and 2016. Vessels were removed from the fleet using either the OPA 90 or MARPOL 13/G phase out schedules for single hulled, double sided, and double bottomed vessels. No militarily useful newbuildings were on order by current owners of EUSC

tankers in the M.I.T. database as of June 2002. The EUSC, militarily useful tanker fleet is forecasted to decline by 69 percent, in terms of number of vessels, and by 56 percent, in terms of delivered capacity, between June 2002 and January 2016.

4) The OPA 90 phase out schedule produced a more accelerated decline in the capabilities of the militarily useful, EUSC tanker fleet than the MARPOL 13/G regulations. Figures 5.1 through 5.4 presented the forecasts for the applicable EUSC fleet for 2001 through 2016. Because there are no chemical carriers in the M.I.T. database, the OPA 90 and MARPOL 13/G (revised) regulations result in the same remaining fleet for 2016. Based on this observation, the OPA 90 phase out approach was used throughout the remainder of the chapter.
5) Military planners prefer tankers with coated cargo tanks. A breakdown of the EUSC, militarily useful tanker fleet for 2002 through 2016 is found in Figures 5.5, 5.6, 5.7, and 5.8. Group I tankers have coated cargo tanks while Group II tankers have partially coated or uncoated tanks. In 2006, only fourteen of the 25 remaining tankers have coated tanks. By 2016, only six Group I tankers remain.
6) The distance to theater was estimated to average around 3,000 nautical miles based upon expected supply regions and the most demanding war scenarios. The effect of varying the distance to theater was investigated for a range of 1,500 to 10,000 nautical miles. All possible sealift scenarios should fall within this range. Increasing the distance from 3,000 to 5,000 nautical miles resulted in a reduction in the EUSC fleet's delivered capacity of 38 percent. The delivered capacity was reduced by 61 percent when the distance is increased from 3,000 to 8,000 nautical miles.
7) A limited analysis of the future capacity of the militarily useful, U.S. flag tanker fleet was performed. Based upon the OPA 90 phase out schedule and the current orders of new tank vessels, the capacity of the fleet is expected to decline by 36 percent through 2006 and by 48 percent through 2011. A trend of replacing phased out product tankers with smaller combination tug-barges

for coastwise trading has been observed. Tug-barge combinations have not been considered militarily useful in this study. The same assumption was used in the MRS-05 study.

8) A source of uncertainty in the forecasts of the EUSC tanker fleet was the amount of phased out tonnage that would be replaced with EUSC eligible, militarily useful tonnage. Currently, no replacement or additional tonnage is on order. Based upon the historical decline of the total EUSC fleet, it was decided that the rate of replacement would lie between zero and 50 percent. The effect of changing the percentage of replacement is displayed in Figures 5.13, 5.14, and 5.15. Even if 50 percent of phased out tonnage is replaced, the number of vessels, the total dwt, and the deliverable capacity of the fleet will still fall by around 39 percent, 32 percent, and 36 percent, respectively.
9) The great majority of vessels in the M.I.T. database for June 2002 are owned by U.S. companies that also operate vessels in the U.S. flag merchant fleet. This situation indicates that the futures of both fleets are linked. Favorable alterations in current U.S. tax policy concerning income from U.S. owned, foreign flag vessels would benefit many of the companies that operate vessels under the U.S. flag.
10) The strategic tanker sealift sources available to U.S. military planners dropped from 140 tankers in 2001 to 108 ships for 2002 (largely due to changes in the database of militarily useful, EUSC tankers). The total pool of vessels drawn from all tanker sealift sources available to the DoD is projected to fall to 82 vessels by 2006 and to only 44 vessels by 2016. A pool of 78 or 107 tankers for inter-regional sealift was deemed sufficient for U.S. military needs in 2005 according to the MRS-05 study. The lower number corresponds to the use of additional Host Nation Support while the higher number assumes the use of 20 uncoated tankers under the limited HNS requirement of the Defense Energy Support Center (DESC). However, our study estimated a maximum of 75 suitable tankers to be available to U.S. military planners for inter-regional sealift at the start of 2006. Some of these 75 tankers may only be suited for intra-regional sealift service or may be committed to on-going MSC

duties. Of these tankers, a maximum of 64 tankers have coated cargo tanks. We expect that this value significantly overestimates the available tankers with coated cargo tanks as only the coatings of EUSC tankers have been confirmed. Based on the MRS-05 study's conclusions, the projections generated by our study indicate that a shortfall in sealift tankers is expected to exist in 2006. This situation is forecasted to deteriorate further by 2011 and 2016.

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CHAPTER 6

ALTERNATIVE SOURCES OF SEALIFT TANKERS

In Chapter 5, a potential shortfall in the number of available tankers for military sealift needs was identified for the beginning of 2006. This chapter will explore several possible approaches to alleviating this looming shortfall. The options will be discussed in the context of alternative sources to be utilized once U.S. controlled sources of militarily useful tankers have been exhausted. The U.S. controlled sources include the Military Sealift Command, the Ready Reserve Force, the U.S. flag fleet, and the EUSC fleet. Major alternatives include the chartering of foreign owned tonnage and the use of U.S. owned tankers of a size greater than 100,000 dwt. Primarily, this chapter will focus on the potential for using EUSC tankers over 100,000 dwt.

FOREIGN OWNED TANKER CHARTERS

In the event that the available pool of U.S. controlled, militarily useful tankers is insufficient to meet the needs of the U.S. military, military planners could attempt to charter foreign owned tonnage on the world market or possibly from NATO member nations and other allies. The MSC utilizes the world market for moving military fuels to destinations around the world when suitable U.S. flag tankers are unavailable. MSC is required by U.S. law to exhaust U.S. flag sources before utilizing the open market. This approach is also considered in the MRS-05 study when all U.S. controlled tonnage, including tankers with coated and uncoated cargo tanks, has been employed. The MRS-

05 study identifies a Handysize, militarily useful tanker for chartering as needed to augment the available U.S. controlled fleet. These tankers, referred to as Handysized Tanker Equivalents (HSTEs), have a length overall (LOA) of 625 feet, a 235,000 barrel capacity, a maximum beam of 100-feet, and a loaded draft of 36 feet. In the MRS-05 study, no foreign owned HSTEs are required under any scenario considered.

In accordance with current U.S. military requirements, foreign owned HSTEs would only be called upon in the event that the use of all available U.S. controlled tankers does not meet emergency sealift needs. The reason that the U.S. military would call upon these vessels only as a last resort involves the issue of the reliability of foreign owned tonnage during a conflict. Current U.S. military planning requires the consideration of various dual Major Theater War scenarios. One of the main advantages of using U.S. flag and EUSC tonnage is the authority of the president to requisition these vessels during a national emergency. Foreign owners may be unwilling to undertake U.S. charters because of the scope and scale of these potential conflicts. It is also difficult to foresee which nations and owners would remain strictly neutral partners with the U.S. or serve as allies of the U.S. during these diverse scenarios. The reliability concerns during these large-scale conflicts make reliance on non-U.S. companies a last resort for planning purposes.

Another concern with foreign owned vessels is the issue of crew nationality. In a conflict involving the United States, nationals unquestionably would be considered to be the most reliable officers and crew members. The law requires U.S. flag vessels to be manned by

American citizens, so the nationality of the crew is not an issue with respect to those vessels. However, with both EUSC and foreign owned vessels, the DoD has made no arrangements to pre-screen their crews. Cooperative agreements with the owners of EUSC vessels could lead to an opportunity for the DoD to vet potential sealift tankers and their crews before requisitioning or chartering these ships. For instance, the four companies that currently own EUSC tankers over 100,000 dwt have been contacted to discuss the nationality of their seafarers. The breakdown of their crews by nationality is as follows:

- ✓ ExxonMobil – Predominately citizens of the United Kingdom, India, and the Philippines, to a lesser degree citizens of Greece.
- ✓ ChevronTexaco – Predominately citizens of Northern European countries, Italy, India, and the Philippines.
- ✓ Overseas Shipholding Group – Predominately citizens of South Korea, the Philippines, and Croatia.
- ✓ Conoco – Predominately citizens of India and Honduras, to a lesser extent citizens of Norway.

This information combined with a frequently updated database of available EUSC tankers would permit the MSC to make decisions about individual EUSC tankers. A similar vetting system would be impractical, if not impossible, to develop for foreign owned vessels in the worldwide charter market.

U.S. OWNED TONNAGE OVER 100,000 DWT

As discussed in Chapter 2, the current definition of *military useful* includes only tankers under 100,000 dwt. An expansion of this definition to include tankers over 100,000 dwt can be considered for both the EUSC and the U.S. flag tanker fleets. This section will

examine the benefits and obstacles to utilizing tankers over 100,000 dwt, including Aframax tankers, Suezmax tankers, and VLCCs.

Canal and Port Restrictions

The current exclusion of tankers over 100,000 dwt from military useful status involves concerns over the ability to make use of these tankers in the maximum number of scenarios. The major concerns are the length, beam, and draft restrictions of loading and discharge ports and of canals. For certain trade routes, canal restrictions define the major dimensions and the maximum capacity of the vessels. The pertinent canals for inter-regional tanker sealift include the Panama Canal and the Suez Canal.

The Panama Canal has length, beam, and draft restrictions for transiting vessels. While the length restriction of 965 feet and the beam restriction of 106-feet cannot be circumvented, the draft restriction of 39' 6" for Tropical Fresh Water can be accommodated through the light loading of the vessel.[12] The maximum tanker size that can transit the Panama Canal is referred to as Panamax. Generally, the maximum size of Panamax tankers is 80,000 dwt. This upper limit on capacity explains division of product tankers into separate categories for ships over and under 80,000 dwt in the MARAD militarily useful databases. However, many tankers classified as Panamax because of their dwt are still unable to use the Panama Canal because of the beam restriction. In the MRS-05 study, only six of the 87 tankers in the baseline fleet can transit this canal without light loading while seven ships still cannot use the canal because of excessive beams. In the M.I.T. database of EUSC, militarily useful tankers for June 2002,

[12] Panama Canal Commission Website, www.orbi.net/pancanal/pcc.htm, June 2002.

seventeen of the 29 tankers in the database cannot transit the Panama Canal because of the beam restriction. At least five of the twelve tankers that can transit the Panama Canal must employ light loading to avoid the draft restriction. Fortunately for military planners, the use of the Panama Canal appears to be avoidable for all scenarios considered by the MRS-05 study.

The Suez Canal has no length restriction. It does have a beam restriction of 245-feet and a maximum permissible loaded draft of 58'-0".[13] Tankers of the maximum size that can transit this canal are referred to as Suezmax. Suezmax vessels encompass the size range between 115,000 to 200,000 dwt. Because of their size, no Suezmax vessels are currently considered militarily useful. The ability to transit the Suez Canal is an important attribute of militarily useful tankers as it facilitates the transfer of military fuels between Europe or the U.S. and the regions where conflicts are expected to result in the highest fuel requirements.

While the ability to transit canals is a significant consideration for defining a militarily useful tanker, a more important requirement for these tankers is the ability to access the available regional berthing for loading and unloading their cargos. The regional POL berths used in the MIDAS modeling of the MRS-05 study entail length and draft restrictions. While several berths have deepwater available, it is important to consider that the berth on the other end of the supply chain may be the limiting factor. Given the draft restrictions outlined in the MRS-05 study, it appears that many of the EUSC, militarily useful tankers in the M.I.T. database for June 2002 will be forced to employ

[13] Leth Suez Transit Ltd AS Website, www.lethsuez.com/suezcana.htm, June 2002.

light loading in order to access these berths. Length restrictions will also be an issue for the berths modeled in the MRS-05 study because nearly all of these tankers have lengths in excess of 750-feet. The MRS-05 study acknowledges that many of the tankers considered cannot be used efficiently in all scenarios and that the use of larger militarily useful tankers, between roughly 60,000 and 100,000 dwt, requires the use of light loading and lightering techniques.

U.S. Flag Tankers over 100,000 dwt for June 2002

From the database of U.S. flag tankers contained in Appendix B, it was found that there were twelve tankers with over 100,000 dwt available from the U.S. flag tanker fleet as of February 2001. All of these tankers operate as crude oil carriers on the West Coast of the United States, especially between Alaska and the West Coast refineries. Their sizes range from Aframax to smaller VLCCs. The importance of these vessels to the functioning of U.S. economy, especially during national emergencies when foreign supplies may be disrupted, should be noted. The crude oil transported from Alaska's oil fields to the West Coast makes up a large percentage of the oil supply for the western states. If these tankers were removed from their current service for use in a military sealift role, they would have to be replaced, as there is no other method of moving crude oil from Alaska to the lower 48 states. If these vessels were to be called upon, the most viable source for replacement vessels, while maintaining the security of American ports, would be similar tankers from the EUSC fleet.

EUSC Fleet over 100,000 dwt for June 2002

In the course of compiling the M.I.T. database for militarily useful tankers, a separate database of EUSC tankers over 100,000 dwt was investigated. Through our investigation, several companies with EUSC tankers over 100,000 dwt were discovered. These companies were contacted regarding the current size, the planned newbuildings, the cargo tank coatings, and the nationality of the crews of their EUSC qualified tankers. The M.I.T. database of EUSC tankers over 100,000 dwt for June 2002 was constructed as shown in Table 6.1. See Appendix J for more complete information.

The EUSC tanker fleet over 100,000 dwt contains 36 tankers with a combined dwt of 7,860,870. In April 2000, according to the MARAD EUSC database, this fleet included 42 vessels with a total dwt of 8,945,810, which indicates a 12 percent decline. The currently existing fleet is relatively new with an average age of 4.6 years. With the exception of the two Conoco tankers of roughly 105,000 dwt, the rest of these tankers have uncoated or partially coated tanks (Group II). Only five of these vessels will be phased out by the end of 2015 as they are non-double hull tankers.

Total EUSC Fleet for June 2002

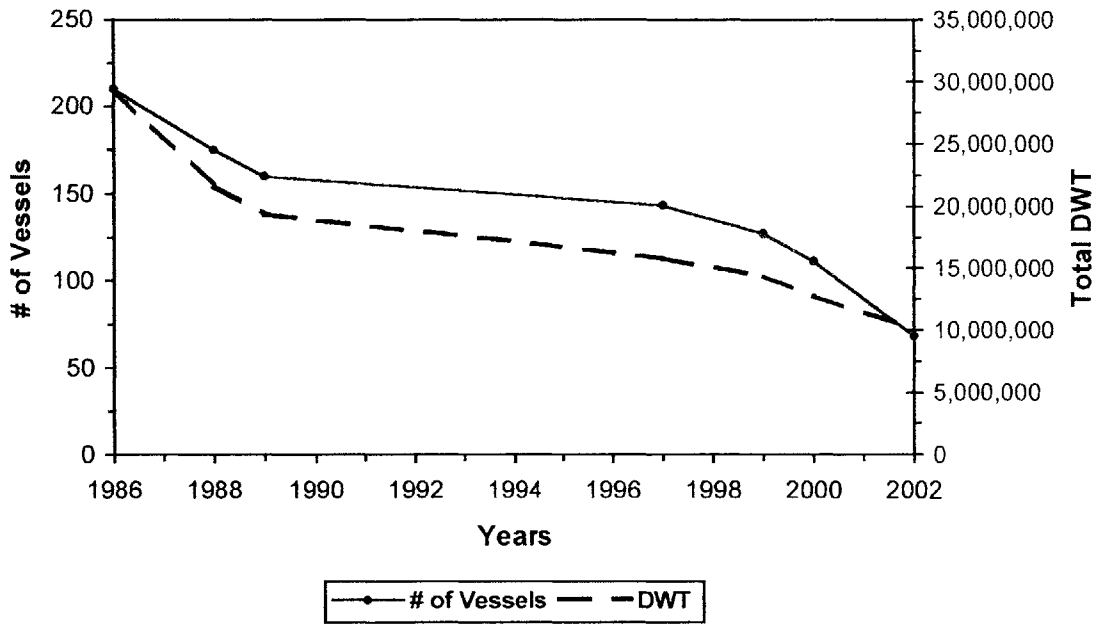
With a confirmed database for EUSC tankers over 100,000 dwt for 2002, the size of the entire EUSC tanker fleet for June 2002 can be constructed. In June 2002, this M.I.T.-developed fleet has 68 vessels and a combined dwt of 10,090,756. The complete EUSC tanker fleet is shown for the years 1986 through 2002 in Figure 6.1. The total fleet is shown to have declined by 68 percent in terms of number of vessels and by 66 percent in terms of dwt between 1986 and 2002. Between just 2000 and 2002, the total fleet

dropped by 39 percent and 21 percent in terms of number of vessels and dwt,

M.I.T. EUSC, Tankers over 100,000 DWT – Listing by Parent Company					
Ship Name	Vessel Owner	Built	DWT (LT)	Hull	Group
Chevron Texaco Shipping Co.					
CHEVRON EMPLOYEE PRIDE	CM Pacific Maritime Corp.	1994	156,447	DH	II
CHEVRON MARINER	Chevron Transportation Corp.	1994	156,382	DH	II
CONDOLEEZZA RICE	Chevron Transportation Corp.	1993	135,829	DH	II
GEORGE SHULTZ	Chevron Transportation Corp.	1993	136,055	DH	II
CHEVRON PERTH	Chevron Transportation Corp.	1975	276,838	SH/NBT	II
JAMES N. SULLIVAN	Chevron Transportation Corp.	1992	135,915	DH	II
SAMUEL GINN	Chevron Transportation Corp.	1993	156,835	DH	II
WILLIAM E. CRAIN	Chevron Transportation Corp.	1992	155,127	SH/SBT	II
Conoco Inc.					
SENTINEL	Conoco Shipping Co.	1999	104,700	DH	I
CONSTITUTION	Conoco Shipping Co.	1999	104,623	DH	I
ExxonMobil Corporation					
EAGLE	Mobil Shipping Co. Ltd.	1993	301,691	DH	II
RAVEN	Int'l Marine Transportation	1996	301,658	DH	II
ALREHAB	Int'l Marine Transportation	1999	301,620	DH	II
KESTREL	Int'l Marine Transportation	2000	307,000	DH	II
HAWK	Int'l Marine Transportation	2000	307,000	DH	II
FLINDERS	Mobil Shipping & Trans.	1982	149,000	SH/SBT	II
ECLIPSE	Mobil Shipping & Trans.	1989	135,000	SH/SBT	II
OSPREY	Int'l Marine Transportation	1999	301,000	DH	II
RAS LAFFAN	Int'l Marine Transportation	1999	105,424	DH	II
VALIANT	Int'l Marine Transportation	1999	105,476	DH	II
Overseas Shipholding Group					
EQUATORIAL LION	First Union Tanker Corp.	1997	273,539	DH	II
MERIDIAN LION	Second Union Tanker Corp.	1997	300,578	DH	II
REGAL UNITY	Regency Tankers Corp.	1997	309,966	DH	II
CROWN UNITY	Imperial Tankers Corp.	1996	300,482	DH	II
MAJESTIC UNITY	Royal Tankers Corp.	1996	300,549	DH	II
OLYMPIA	Olympia Tanker Corp.	1990	258,076	SH/SBT	II
SOVREIGN UNITY	Majestic Tankers Corp.	1996	309,892	DH	II
OVERSEAS CHRIS	OSG Affiliate/Subsidiary	2001	304,401	DH	II
OVERSEAS ANN	OSG Affiliate/Subsidiary	2001	304,494	DH	II
OVERSEAS DONNA	OSG Affiliate/Subsidiary	2000	304,608	DH	II
RAPHAEL	OSG Affiliate/Subsidiary	2000	304,722	DH	II
HULL 1372	OSG Affiliate/Subsidiary	2002	313,963	DH	II
OVERSEAS FRAN	OSG Affiliate/Subsidiary	2001	110,347	DH	II
OVERSEAS JOSEFA	OSG Affiliate/Subsidiary	2001	110,427	DH	II
OVERSEAS SHIRLEY	OSG Affiliate/Subsidiary	2001	110,286	DH	II
HULL 1286	OSG Affiliate/Subsidiary	2002	110,920	DH	II

Note: DH – Double Hulled; SBT – Segregated Ballast Tanks; NBT – No Segregated Ballast Tanks
Source: Appendix J

Table 6.1, M.I.T. EUSC, Fleet of Tankers over 100,000 dwt for June 2002



Source: 1) Marcus, Henry et. al., "U.S. Owned Merchant Fleet: The Last Wake-Up Call?", M.I.T., 1991.
2) U.S. Owned, Foreign Flag Fleet Database, MARAD, January 1997.
3) U.S. Owned, Foreign Flag Fleet Database, MARAD, July 1999.
4) U.S. Owned, Foreign Flag Fleet Database, MARAD, April 2000.
5) Appendix J

Figure 6.1, Total EUSC Tanker Fleet – # of Vessels & Total DWT

respectively. The average tanker size in the MARAD database for January 1997 was 110,506 dwt while the average tanker size in 2002 is 148,393 dwt.

A projection of the current EUSC tanker fleet over 100,000 dwt to the start of 2006 requires the removal of single hull tankers that will pass their phase out dates and the addition of newbuildings to the list. EUSC newbuilding information was acquired from the owners in the database for June 2002. For the start of 2006, the EUSC tanker fleet over 100,000 dwt is expected to possess 37 vessels with a combined dwt of 7,970,835.

See Appendix J. The projected totals for the entire EUSC tanker fleet for January 2006 are 62 vessels and 9,703,562 dwt. All replacement tonnage presently on order by companies with EUSC vessels possesses a dwt greater than 100,000 dwt.

Tanker Categories above 100,000 DWT

Most modern tankers can be categorized according to size as one of the five following types:

- ✓ Handysize/Handymax – 35,000 to 45,000 dwt
- ✓ Panamax – 45,000 to 80,000 dwt
- ✓ Aframax – 80,001 to 114,999 dwt
- ✓ Suezmax – 115,000 to 200,000 dwt
- ✓ VLCC/ULCC – over 200,000 dwt

Handysized tankers provide the most utility to military planners in terms of flexibility and access to ports and canals. These tankers and the Panamax vessels, which were described in an earlier section, meet the current dwt standards for militarily useful tankers. Aframax tankers encompass a dwt range that places some tankers within the militarily useful standard while others are disallowed. None of the Suezmax tankers, VLCCs, and ULCCs meet the current militarily useful standard. In this section, the general dimensions and potential applications of Aframax, Suezmax, and VLCCs in the tanker sealift service of the U.S. military will be discussed.

Aframax Tankers

There are fourteen Aframax size tankers in the June 2002 database for EUSC, militarily useful tankers. This group of tankers has the following approximate dimensions:

- ✓ Length Overall (LOA) of 805 feet
- ✓ Beam of 138 feet
- ✓ Draft of 44.5 feet.

Examining the June 2002 database for EUSC tankers over 100,000 dwt reveals a total of eight Aframax tankers in this fleet. The approximate dimensions of these vessels are as follows:[14]

- ✓ LOA of 800 feet
- ✓ Beam of 138 feet
- ✓ Draft of 49 feet

A comparison of the dimensions of militarily useful, Aframax tankers to non-useful Aframax tankers reveals that the only noteworthy difference is the larger draft of the latter group, which amounts to a difference of less than five feet.

Tankers exceeding Panamax size are approaching the limits of militarily usefulness because light loading is required to allow these vessels to enter the envisioned regional berths. In addition, some of these tankers are too long to use the proposed berths in the MRS-05 study. However, the limited differences between Aframax tankers below 100,000 dwt and those above 100,000 dwt makes the 100,000 dwt cutoff for military usefulness appear too low. It seems that all tankers up to about 115,000 dwt would be useful in a tanker sealift effort. The light loading requirements make these vessels less

[14] Clarkson Research Studies, "Clarkson Register CD – 2001 Edition", London, January 2001.

efficient in this role; however, these vessels can still access most of the same ports as tankers between 80,000 and 100,000 dwt. Thus, they can provide an additional source of inter-regional sealift vessel. Considering the expected decline in EUSC, militarily useful tanker tonnage over the next thirteen years, an increase in the dwt cutoff to include these Aframax tankers would provide eight additional tankers in June 2002 and ten more tankers in 2006. The inclusion of all Aframax tankers is further justifed when it is considered that by 2016 all remaining EUSC, militarily useful tankers will possess a size greater than 93,000 dwt.

Suezmax Tankers

The nine Suezmax tankers in M.I.T.'s 2002 database of EUSC, militarily useful tankers over 100,000 dwt range between 135,000 and 157,000 dwt. While the dimensions of Suezmax class tankers vary more than Aframax tankers, the average dimensions of this portion of the fleet are as follows:[15]

- ✓ LOA of 887 feet
- ✓ Beam of 159 feet
- ✓ Draft of 55 feet.

Even lightly loaded, Suezmax tankers are too large to use most of the berths proposed by military planners. Assuming that these tankers can operate in the same capacity as tankers under 115,000 dwt would result in overestimating the fleet's delivered capacity. However, these vessels could be used effectively as "motherships" in an inter-regional sealift role. The mothership would transfer its cargo to a fleet of smaller intra-regional tankers closer to the war zone. The major benefit of using a large tanker for the long-haul

[15] Ibid.

portion of the POL supply chain is that it can replace several smaller vessels. For example, a 140,000 dwt Suezmax tanker is roughly the equivalent of 3.5 handysized tankers of 40,000 dwt each. Such a strategy is especially useful when there is a shortage of available, militarily useful tonnage. Further, as shown in Figure 5.9 of Chapter 5, shorter routes for a fleet of militarily useful tankers result in a higher amount of delivered capacity per month. If large capacity tankers are used on the long haul routes, then the available shallow draft tankers working in a lightering/transfer role within the region will be capable of delivering more fuel per month. Employing Suezmax tankers in an inter-regional sealift role is also a viable option because these vessels can transit the Suez Canal.

VLCCs and ULCCs

The category for VLCCs and ULCCs encompasses all tankers above 200,000 dwt. These massive tankers have been built to sizes of more than 550,000 dwt. The dimensions of VLCCs and ULCCs vary widely with dwt. These vessels are incapable of transiting any canal and are substantially limited in the number of ports they can access, especially without lightering. A major drawback to using these tankers for military purposes is their extreme draft, which is upwards of 65 feet. However, these vessels could be employed in a mothership role similar to the Suezmax tankers.

Obstacles to Military Usefulness for Tankers over 100,000 dwt

The major problems with using Aframax and larger tankers for the carriage of fuel products are the lack of full coatings for the cargo tanks as most of these ships are

employed as crude oil carriers. U.S. military planners prefer tankers with coated cargo tanks because the tanks are easier to clean and the risk of cross-contamination is reduced. They can be used to carry all military fuel products. However, there are procedures and standards for employing tankers with uncoated tanks during emergencies.

The military standards for tank cleaning procedures are outlined in the Defense Energy Support Center's MIL-STD-3004.[16] In Chapter 5.11.4 of this document, reference is made to Table XXIV, where the minimum requirements for the preparation of tanker cargo tanks are presented. In this table, the process for switching a tanker with uncoated tanks from carrying crude oil to all military fuels can be found. It makes reference to the Naval Sea Systems Command's MIL-HDBK-291(SH)[17], where the exact procedures for cleaning an uncoated cargo tank that previously carried crude oil are found. The first step in this process requires the mucking out the tanks, the cleaning the tanks with a hot water wash, the hand hosing of the tank bottom, and the flushing of cargo lines. After the first cleaning, a Quality Assurance Representative of the MSC inspects the vessel, and it is permitted to carry F-76 diesel fuel if it passes inspection. After successfully carrying the first load of F-76, the vessel's uncoated tanks can be switched to carrying the more sensitive jet fuels, JP-5 and JP-8, by another round of hot water machine-washing of the tanks and cargo lines. Gaining MSC permission to carry the jet fuels necessitates another thorough inspection.

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[16] Defense Energy Support Center, MIL-STD-3004, Department of Defense Standard Practice: Quality Surveillance for Fuels, Lubricants, and Related Products, Department of Defense, November 1, 1999.
[17] Naval Sea Systems Command, MIL-HDBK-291(SH), Military Handbook: Cargo Tank Cleaning, Department of Defense, September 26, 1986.

The switching of Suezmax tankers and VLCCs from crude oil to JP-8, the fuel generating the greatest sealift demand for the scenarios envisioned in the MRS-05 analysis, would require a great deal of cleaning and inspection time. However, these large crude carriers with uncoated tanks do have the potential to carry huge amounts of military fuels once the cleaning process is completed, especially during an emergency. Extensive reliance on these tankers in the early stages of a conflict, though, could lead to shortfalls because of the lengthy cleaning period.

It should also be considered that during a multiple war scenario, the value of U.S. controlled tonnage surpasses its potential for alleviating an undersupply of militarily useful tankers to meet the military's sealift needs. EUSC VLCCs and Suezmax tankers could also be called upon to supply the U.S. economy with crude oil from friendly foreign suppliers or to replace U.S. flag vessels in the domestic trade. In these ways, EUSC vessels are used to improve the security of the U.S. during war. Maintaining the EUSC fleet and reversing its decline would help protect more than just the military's supply of sealift vessels.

Substitution for Handysized Tanker Equivalents

The previous sections presented a conceptual approach to investigating the expansion of the DoD's interest in U.S. controlled tankers to include ships larger than 100,000 dwt. In this section, the possibility of including a broader size range under the militarily useful concept will be further explored by calculating the number of smaller vessels that can be

replaced through the use of larger EUSC tankers and the potential cost savings of this approach.

The EUSC tanker fleet of vessels over 100,000 dwt includes Aframax tankers, Suezmax tankers, and VLCCs. Using the general methodology and the spreadsheet model outlined in Chapter 5, the delivered capacity of these larger tankers was calculated for a distance to theater of 3000 nautical miles. Using this delivered capacity per ship, the number of Handysized Equivalent Tankers (HSTEs) that an average vessel from each size category in the current EUSC tanker fleet over 100,000 dwt for June 2002 could replace was determined. HSTEs are discussed in more detail in a previous section of this chapter. The vessel characteristics used for each category of large tanker are based upon the average vessel in that category in the current EUSC tanker fleet over 100,000 dwt. The characteristics are summarized in Table 6.2.

Category	Vessel Characteristics			
	DWT[1,2] (long tons)	Speed[3] (knots)	Capacity[1,2] (barrels)	Daily Cost at Sea[3] (dollars/day)
Aframax Tanker	107,775	15	765,205	26,680
Suezmax Tanker	147,513	15	1,072,889	31,142
VLCC	299,057	15	2,127,397	47,643
HSTE	40,000	14	235,000	18,645

Notes: Aframax Tanker includes only ships over 100,000 dwt
Source: 1) Appendix J
2) USTRANSCOM, Department of Defense, "MRS-05 Tanker Sealift Analysis" (Unclassified Version), U.S. Department of Defense, 2001.
3) Army Corp of Engineers, "Data for FY2000: Foreign Flag Tanker Costs: Double Hull (1999 Price Levels)", 2000.

Table 6.2, Vessel Characteristics of Average EUSC, Large Tankers and HSTEs

The daily cost information was obtained from the Army Corp of Engineers data for Fiscal Year 2000 Foreign Flag Tanker Costs[18]. The "Daily Total Cost at Sea" operating cost information is provided for 7-year old, double hull tankers for a size range from 20,000 dwt to 325,000 dwt. Where necessary, interpolation was used to obtain the cost information for the average tanker in each size category. This information is used to calculate the potential savings of using tankers over 100,000 dwt in the long-haul portion of the supply chain in lieu of the equivalent number of HSTEs. In an actual conflict, market conditions would set the charter rates of all vessels.

Information on the EUSC fleet of tankers greater than 100,000 dwt was taken from the M.I.T. database for this portion of the EUSC fleet for June 2002. A breakdown of the total fleet is presented in Table 6.3.

Category	Vessel Characteristics			
	DWT[1]	Avg. Speed[2]	Capacity[1] (barrels)	# of Avg. Sized Tankers[1]
Aframax Tankers	862,203	14.9	6,121,641	8
Suezmax Tankers	1,316,590	15.2	9,656,000	9
VLCCs	5,682,077	15.1	40,420,535	19
Total Fleet	7,860,870	15.1	56,198,176	36

Notes: Aframax Tanker includes only ships over 100,000 dwt
Source: 1) Appendix J
2) Clarkson Register

Table 6.3, Characteristics and Size of the EUSC Fleet of Tankers over 100,000 dwt

In addition to a vessel's physical characteristics, there are efficiency constraints tied to the vessel's performance. Efficiency in this context is a measure of the achieved

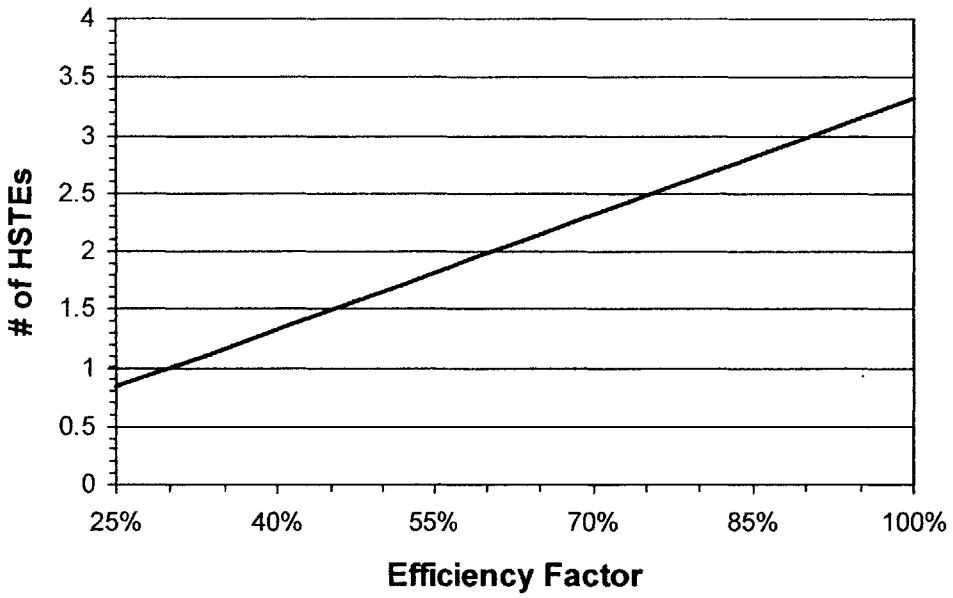
[18] Army Corp of Engineers, "Data for FY2000: Foreign Flag Tanker Costs: Double Hull (1999 Price Levels)", 2000.

delivered capacity versus the maximum possible delivered capacity. The handysized vessels are assumed to achieve 100 percent efficiency in a tanker sealift role. For the larger tankers in this application, the need to light load, lighter, or transfer military fuels to and from these vessels is the primary factor that reduces the effectiveness of these vessels. Rough weather might delay lightering operations. In addition, there is the possibility that the Suezmax tankers and the VLCCs will have to remain in theater as floating storage vessels for a period of time until their entire cargo is required. For the VLCCs, certain routes may require additional trip time not included in the distance to theater value. All of these hindrances to top performance by larger EUSC tankers in the inter-regional sealift role can be compiled into one efficiency factor. The actual efficiency factor that occurs would depend on the specific situation involved. The efficiency was varied between 25 percent and 100 percent for each analysis to demonstrate the effect of this factor on performance.

The results of this analysis have been collected into a series of figures. Figure 6.2, 6.3, and 6.4 display the number of HSTEs that can be replaced for each Aframax tanker, Suezmax tanker, and VLCC, respectively, while varying the efficiency factor. Figures 6.5, 6.6, and 6.7 provide the potential cost savings of using larger tankers versus HSTEs for each category of EUSC tanker over 100,000 dwt. See Appendix K.

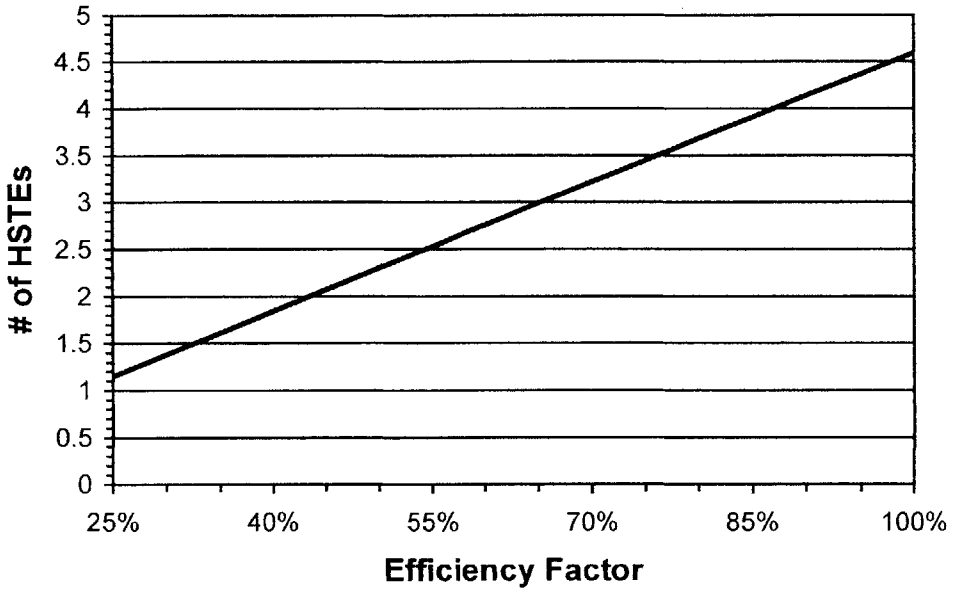
As shown in these graphs, in an emergency where tankers under 100,000 dwt are in short supply, larger EUSC tankers can substitute for militarily useful tankers, as currently defined, even at efficiency factors as low as 25 percent. The number of replaced HSTEs

for a selected efficiency factor can be scaled up to reflect all EUSC tankers of that size category by using the "# of Avg. Sized Tankers" for that category presented in Table 6.3. For instance, if the efficiency factor for Aframax tankers is assumed to be 80 percent, then the total number of HSTEs substituted by the Aframax portion of the EUSC fleet over 100,000 dwt is 21.3 ships. Similarly, for the same efficiency factor, the potential savings of using the Aframax portion of the EUSC fleet over 100,000 dwt are 5.5 million dollars per month.



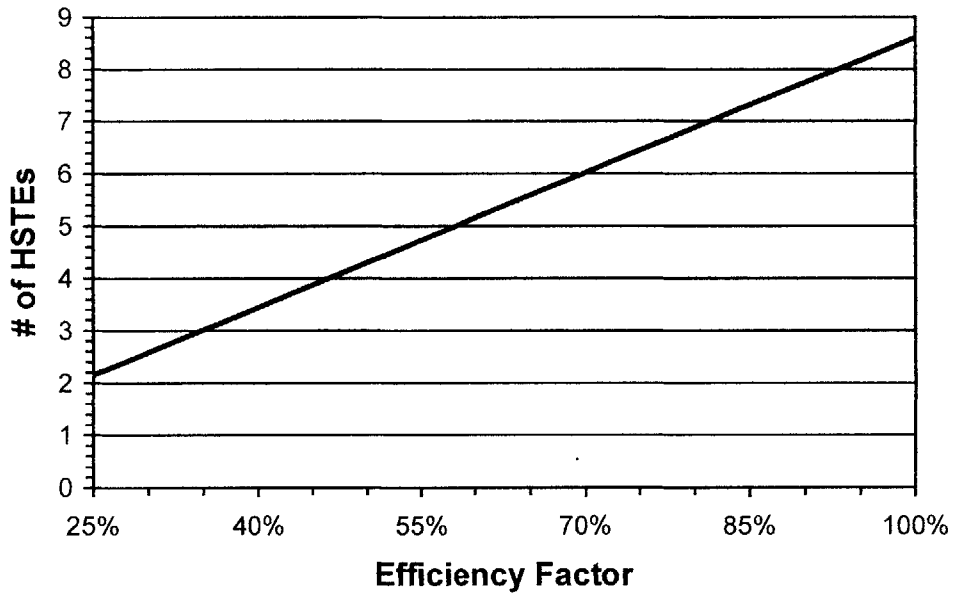
Source: Appendix K

Figure 6.2, # of HSTEs Replaced by an Average EUSC, Aframax Tanker



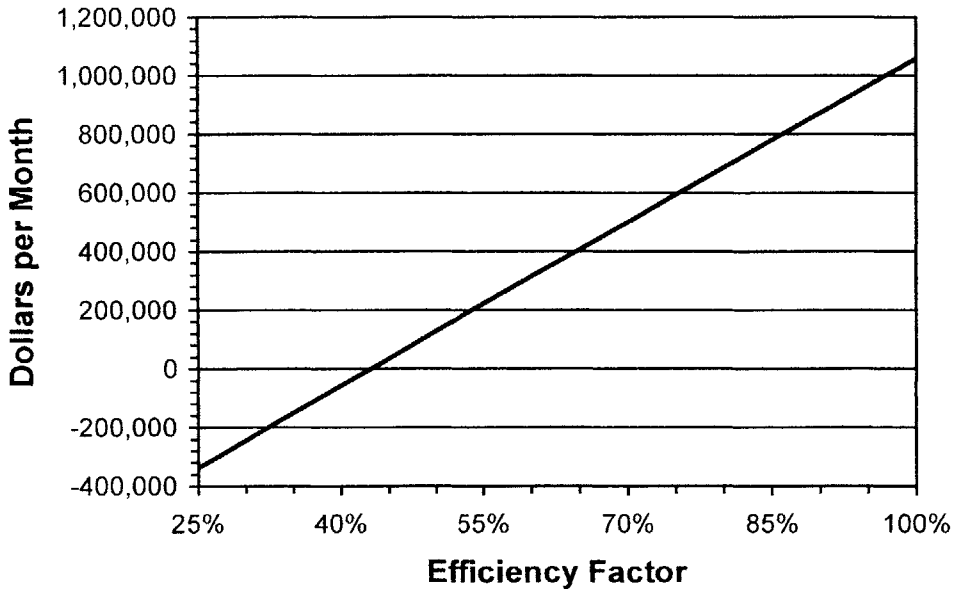
Source: Appendix K

Figure 6.3, # of HSTEs Replaced by an Average EUSC, Suezmax Tanker



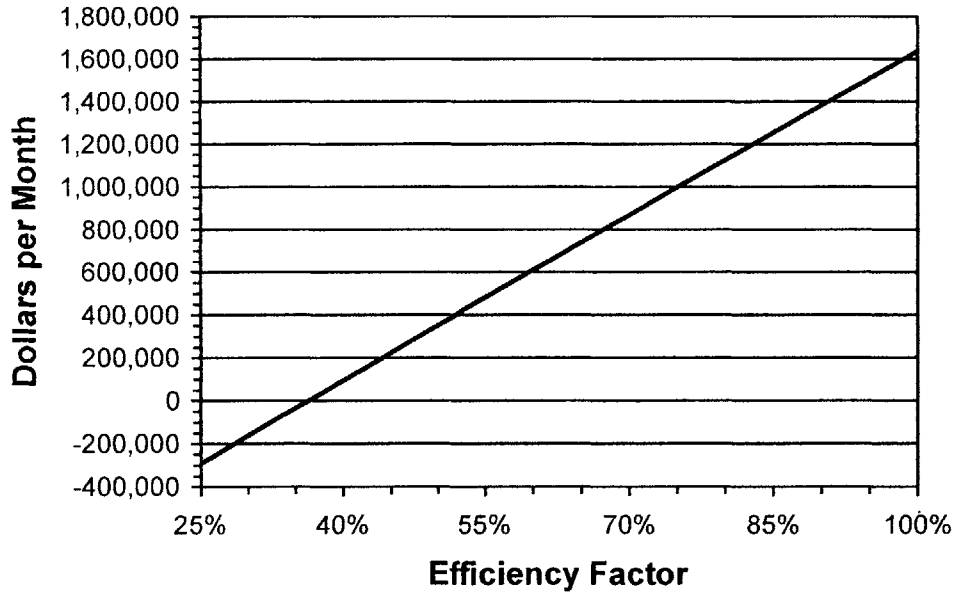
Source: Appendix K

Figure 6.4, # of HSTEs Replaced by an Average, EUSC VLCC



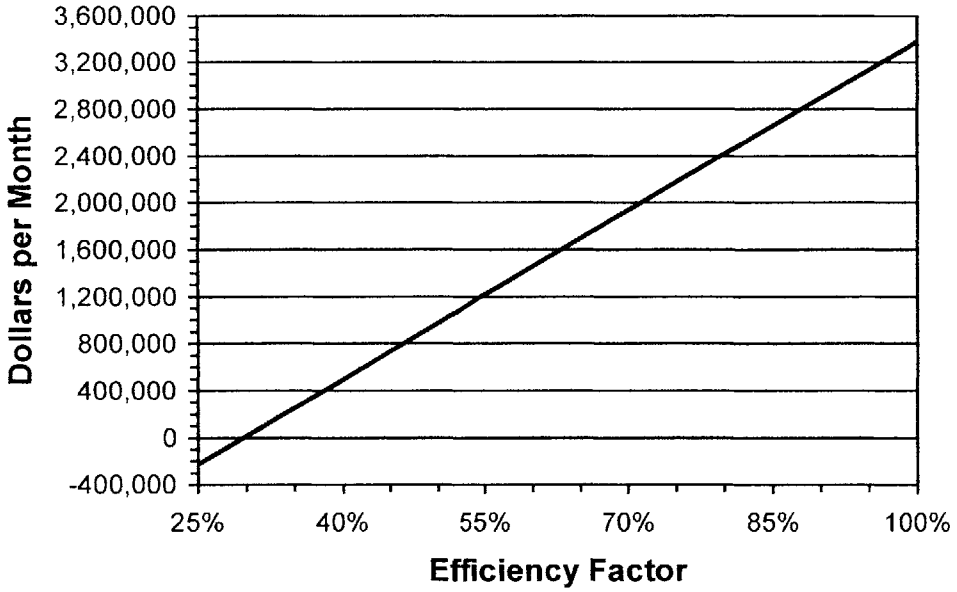
Source: Appendix K

Figure 6.5, Monthly Cost Savings of Replacing HSTEs with an Average, EUSC Aframax Tanker



Source: Appendix K

Figure 6.6, Monthly Cost Savings of Replacing HSTEs with an Average, EUSC Suezmax Tanker



Source: Appendix K

Figure 6.7, Monthly Cost Savings of Replacing HSTEs with an Average, EUSC VLCC

However, it is apparent that there is a sensible lower limit to the value in using EUSC tankers over 100,000 dwt as the efficiency factor assumed is decreased. The efficiency factor at which the operating cost of the larger tanker exceeds the operating costs of a chartered HSTE is one factor to consider. For Aframax tankers, Suezmax tankers, and VLCCs the efficiency factor for a breakeven cost is 43 percent, 36 percent, and 29 percent, respectively. It should be noted that actual charter rates during a conflict may be quite different than the cost factors used in this analysis.

It should be noted that the values cited apply only to a scenario using a distance to theater of 3,000 nautical miles. Increasing the distance to theater improves the effective substitution of EUSC tankers over 100,000 dwt for chartered HSTEs. As an example, an

average Aframax tanker, Suezmax tanker, and VLCC from the EUSC tanker fleet are substituted in scenarios where the distance to theater is changed to 1,500 and 5,000 nautical miles. The results are compared to the baseline case of 3,000 nautical miles in Table 6.4. The efficiency factor is assumed to be 50 percent for the calculations at both distances.

Category	Replaced HSTEs			Potential Savings per Month		
	1,500 nmi	3,000 nmi	5,000 nmi	1,500 nmi	3,000 nmi	5,000 nmi
Aframax Tanker	1.59	1.66	1.69	$88,850	$128,430	$146,200
Suezmax Tanker	2.18	2.30	2.35	$284,030	$351,720	$382,580
VLCCs	3.89	4.30	4.50	$743,590	$975,690	$1,089,170

Note: The 3,000 nautical mile case is the baseline scenario.
Source: Appendix K

Table 6.4, Effect of Varying Distance to Theater on HSTE Substitution and Cost Savings per Month (Efficiency Factor = 50%)

From the results in Table 6.4, the larger tankers perform better as the distance to theater is increased from 3,000 to 5,000 nautical miles. These tankers are penalized as the distance is reduced from the baseline scenario distance. It is apparent that tankers over 100,000 dwt are more effective at substituting for an undersupply of militarily useful tankers in scenarios where the distance to theater is large.

SUMMARY

1) The U.S. military will call upon sources of tanker sealift in the following order: MSC controlled vessels, the Ready Reserve Force, U.S. flag fleet tankers, and EUSC tankers. After these U.S. controlled, military useful sources are exhausted, the military has two main options to obtain additional tonnage. The first of these options

is to charter foreign owned tonnage on the world market. Under this option, the military can obtain the exact type of tonnage it desires, in this case Handysized product tankers with fully coated cargo tanks. The dilemma associated with chartering foreign owned tonnage is the possibility that this source will be unavailable or unreliable during national emergencies. The other alternative is to utilize U.S. owned tonnage that does not meet the dwt requirements of the current military useful standard. These tankers can be sourced from the U.S. flag fleet or from the EUSC fleet. The obstacle to using these tankers is their large size, which limits the ports and canals accessible by these vessels, and their uncoated cargo tanks, which are less preferred by military sealift planners because of the additional cleaning time and the risk of contamination of military fuels. The decision to choose between chartering foreign owned, Handysized tankers and EUSC tankers over 100,000 dwt when the primary sources of sealift tankers have been exhausted will have to be made on a case by case basis.

2) There were only twelve U.S. flag tankers over 100,000 dwt available as of February 2001. These tankers, which serve in the domestic trades of the U.S., would have to be replaced with other tonnage in order to support the U.S. economy if they were requisitioned for sealift service. Substitute vessels could be obtained from the EUSC tanker fleet of vessels over 100,000 dwt.
3) The EUSC fleet of tankers of sizes greater than 100,000 dwt includes 36 ships with a combined dwt of 7,860,870. Nearly all of these tankers have uncoated cargo tanks. The total EUSC tanker fleet consisted of 68 vessels with a combined dwt of

10,090,756 as of June 2002. This fleet declined by 68 percent in terms of number of vessels and 66 percent in terms of dwt between 1986 and June 2002.

4) All Aframax tankers, which range in size between 80,000 and 115,000 dwt, have roughly the same dimensions. Larger dwt ships have a slightly deeper draft. Currently, only Aframax tankers up to 100,000 dwt qualify as militarily useful. All Aframax tankers could be effectively used with light loading or lightering techniques. Expanding the definition of military useful to encompass all Aframax tankers would provide an additional ten inter-regional sealift tankers in 2006, when a shortfall of militarily useful tankers is expected.
5) Both Suezmax tankers and VLCCs in the EUSC fleet could be used as motherships to support inter-regional sealift operations. In emergencies where smaller tankers are in short supply, these larger tankers could serve on the long-haul portion of the supply chain. This application would free the available small ships to work as intra-regional tankers, where they would operate more efficiently given the shorter route.
6) There are military standards and procedures for switching a tanker's cargo from crude oil, which most EUSC tankers over 100,000 dwt carry, to the sensitive diesel fuels and jet fuels of the military. These procedures can be applied to tankers with uncoated cargo tanks. Thus, during emergencies, the EUSC tankers over 100,000 dwt can be used to transport military fuels. However, the time needed for their cleaning and inspection presents a major difficulty in the event of a rapidly developing conflict of very short duration.
7) The utility of EUSC tankers over 100,000 dwt extends past their potential use in a sealift role. These tankers can be used to replace U.S. flag tankers withdrawn from

the U.S. Jones Act trades for sealift service or to provide crude oil from foreign sources for the U.S. economy. Unlike foreign owned tonnage, the continued presence of EUSC tankers helps to guarantee homeland security because these vessels can be requisitioned by presidential authority. In addition, these tankers and their crews could be vetted through cooperative agreements with EUSC tanker owners prior to their requisitioning.

8) EUSC tankers over 100,000 dwt can be substituted for several Handysized tankers if used in an inter-regional sealift role. The quantity of foreign owned, Handysized tankers that can replaced by a single Aframax tanker, Suezmax tanker, or VLCC from the EUSC fleet will vary with the efficiency of the larger vessel. In this context, efficiency refers to the ratio of the achieved delivered capacity versus the theoretical maximum throughput of the tanker for a given distance to theater. While Handysized tankers are assumed to have an efficiency of 100 percent, a variety of factors related to the size of the vessel will reduce the efficiency factor for each category of larger EUSC tanker. Figures 6.2 through 6.4 provide information on the number of Handysize Tanker Equivalents (HSTEs) that can be replaced by each category of EUSC tanker over 100,000 dwt as this efficiency factor varies between 25 percent and 100 percent. Figures 6.5 through 6.7 show the potential cost savings associated with substituting a single large tanker for multiple HSTEs.

9) As the distance to theater increases, each EUSC tanker over 100,000 dwt is able to replace more HSTEs at any given efficiency factor. Tankers over 100,000 dwt appear to be most effective at substituting for HSTEs in scenarios where the distance to theater is 3,000 nautical miles or more.

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CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The findings in this report lead to the conclusion that the EUSC fleet has declined significantly since the late 1970's and that it will continue to do so unless there is a change in the maritime policies of the United States. While the rate of decline leveled off during the 1990's, it is expected to accelerate as legislation requiring the phase out of non-double hulled tankers continues to take effect over the next thirteen years. This conclusion is supported by the following findings:

- The most recent tax laws concerning shipping income earned by U.S. corporations from foreign subsidiaries were enacted in 1986. The total EUSC tanker fleet declined by 68 percent in terms of number of vessels and by 66 percent in terms of dwt between 1986 and 2002.
- The EUSC, militarily useful tanker fleet is forecasted to decline by 69 percent, in terms of number of vessels, and by 56 percent, in terms of delivered capacity, between June 2002 and January 2016.
- Even if 50 percent of phased out tonnage is replaced, the number of vessels, the total dwt, and the deliverable capacity of the fleet will still fall by around 39 percent, 32 percent, and 36 percent, respectively, between 2002 and 2016.

Another major conclusion is that the EUSC fleet provides a significant source of strategic sealift tanker tonnage in the scenarios foreseen by U.S. military planners. This claim is supported by the following results:

- Tankers comprised 84 percent of the total deadweight of the EUSC fleet in 2000.
- EUSC tankers provided 45 percent of the militarily useful tanker tonnage available to U.S. military planners in 2001.
- In the MRS-05 Sealift Tanker Analysis, the EUSC is expected to provide 43 percent of the total baseline fleet of strategic tanker sealift vessels in 2005.

The U.S. flag fleet and other sources of sealift tankers, such as the Ready Reserve Force, are also in decline as supported by the following results:

- The privately owned, U.S. flag fleet has witnessed a steady decline in terms of total fleet size and of total tankers over the past 30 years. The militarily useful portion of the U.S. flag tanker fleet has fallen by 54 percent since 1990.
- Based upon the OPA 90 phase out schedule and the current orders of new tank vessels, the capacity of the U.S. flag tanker fleet is expected to decline by 36 percent through 2006 and by 48 percent through 2011.
- The average age of a RRF tanker was 41 years of age as of 2001.

The remaining militarily useful, EUSC fleet is sustained by only a few owners, and these owners provide a link between the U.S. flag and EUSC fleets that is generally overlooked in current debates over U.S. maritime policies. The following items support this statement:

- The three largest owner/operators in this study's EUSC, militarily useful tanker database, OSG, ChevronTexaco, and Conoco, Inc., provide 88% of the fleet for 2002 by dwt.
- Four of the seven owner/operators, specifically OSG, ChevronTexaco, Conoco, and ExxonMobil, in the M.I.T. database of EUSC, militarily useful tankers for June 2002 are also owners of vessels that operate in the U.S. flag merchant fleet.

Finally, the total pool of tankers available to U.S. military planners has declined significantly since 1990. This decline in total resources will continue over the next thirteen years. While the latest analysis by the DoD predicted that the U.S. would have suitable tanker resources at the end of 2005, the current study predicts that a shortfall may exist as early as the start of 2006. The primary source of the discrepancy between these studies stems from the use of an incorrect MARAD database for the current militarily useful, EUSC fleet in the DoD analysis. This shortfall will grow even larger after 2006. The following findings support these conclusions:

- Between 1990 and 2001, the total pool of strategic sealift vessels available to the Department of Defense fell from 261 to 140 vessels, or 46 percent.
- The M.I.T. version of the EUSC, militarily useful tanker database for June 2002 contains 32 tankers with a combined dwt of 2,264,078 as opposed to the 63 vessels and 2,996,856 total dwt found in the MARAD database for January 2002.
- Certain military scenarios utilized in the MRS-05 Sealift Tanker Analysis require all 57 militarily useful, EUSC tankers forecasted to exist in 2005 by this DoD analysis. The current study estimates that only 25 of the required 57 ships will exist by the end of 2005.

- The strategic tanker sealift resources available to U.S. military planners dropped from 140 tankers in 2001 to 108 ships for 2002 (largely due to changes in the database of militarily useful, EUSC tankers). The total pool of vessels drawn from all tanker sealift sources available to the DoD is projected to fall to 82 vessels by 2006 and to only 44 vessels by 2016. A minimum pool of 78 tankers for inter-regional sealift was deemed sufficient for U.S. military needs in 2005 according to the MRS-05 study assuming favorable Host Nation Support during the most pressing scenarios. However, the current study estimated a maximum of 75 suitable tankers to be available to U.S. military planners for inter-regional sealift at the start of 2006. Some of these 75 tankers may only be suited for intra-regional sealift service or may be committed to on-going MSC duties. Of these tankers, a maximum of 64 tankers have coated cargo tanks, which represent the most desirable tankers to U.S. military planners. This value significantly overestimates the available tankers with coated cargo tanks as only the coatings of EUSC tankers have been confirmed.

RECOMMENDATIONS

Based upon the conclusions presented in the previous section, several recommendations can be made concerning the need to preserve the strategic sealift resources of the U.S. for use in military emergencies.

1) While the Tax Reduction Act of 1975 began the process of placing U.S. owners of foreign flag vessels at a substantial tax disadvantage compared to most foreign

owners, the Tax Reform Act of 1986 worsened the ability of U.S. owners to remain in the international shipping trade. The long term decline resulting from these tax related disadvantages can only be reversed by changes in the U.S. tax laws regarding shipping income. I recommend that any U.S. initiative to level the playing field in the international shipping market should focus on the EUSC fleet because such changes can be justified on the basis of directly benefiting U.S. military planning and national security. In addition, changing U.S. tax laws to foster a larger EUSC fleet can also be justified because of the benefits to U.S. flag owners as most remaining EUSC owners also operate vessels in the U.S. flag fleet.

2) This study revealed a variety of inaccuracies in the government's databases of the EUSC fleet. These inaccuracies resulted in significantly overestimating U.S. strategic tanker sealift capacity in the most recent analyses of U.S. military planners. Therefore, it is recommended that the U.S. government develop cooperative agreements with EUSC owners as a part of any tax change legislation. Only registered EUSC vessels would qualify for the tax changes. These agreements would improve the accuracy of DoD planning and would permit these vessels to be vetted for cargo suitability and crew nationality concerns prior to the need to call upon this sealift source.

3) It was shown in this report that the current definition of a militarily useful tanker may exclude tankers that would be useful in U.S. military planning. The recommended tax changes provide a long term solution to concerns over access to a suitable pool of the Handysized tankers with coated cargo tanks that are most

desired by U.S. military planners. However, a short term solution to shortfalls in tanker sealift capacity would be to utilize EUSC tankers over 100,000 dwt. These larger tankers could be used in a lightly loaded role or as motherships for near theater lightering operations. In the case of a shortage of U.S. controlled tonnage, each of these vessels could replace several smaller Handysized tankers that otherwise would have to be chartered from less reliable foreign owners on the open market. In addition, larger EUSC tankers could be called into service to supply the U.S. market with crude oil or to replace/augment Jones Act tankers in the domestic trades, which would improve national security during a crisis.

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Appendix A: Foreign Flag Vessels Owned by U.S. Parent Companies as of April 2000

Foreign Flag Vessels Owned by U.S. Parent Companies
Merchant Vessels of 1,000 GRT and Over
As of April, 2000

Vessel Name	Parent Company	Registered Owner	Built	Flag	Vessel Type	DWT
MARLIN	ALCOA	LIB-ORE STEAMSHIP	1977	LI	ORE/OIL CARRIER	15,000
TARPON	ALCOA	LIB-ORE STEAMSHIP	1977	LI	ORE/OIL CARRIER	15,000
PATHFINDER II	ALCOA	LIB-ORE STEAMSHIP	1981	LI	ORE CARRIER	47,560
PROSPECTOR II	ALCOA	LIB-ORE STEAMSHIP	1982	LI	ORE CARRIER	47,535
SENTINEL II	ALCOA	LIB-ORE STEAMSHIP	1982	LI	ORE CARRIER	47,503
ACUSHNET	B + H MARITIME SERVICES	ACUSHNET SHIPPING	1981	BH	TANKER	35,588
AQUIDNECK	B + H MARITIME SERVICES	AQUIDNECK SHIPPING	1981	BH	TANKER	35,597
ACOAXET	B + H MARITIME SERVICES	ACOAXET SHIPPING	1982	BH	TANKER	35,607
CRYSTALVENTURE	B + H MARITIME SERVICES	CHRYSTAL SHIPPING	1980	LI	CHEMICAL TANKER	31,676
ICEPEARL	B + H MARITIME SERVICES	ICEPEARL SHIPPING	1971	CY	FREIGHTER	31,889
HAROLD K. HUDNER	B + H MARITIME SERVICES	H.K.H. SHIPPING	1980	BH	CHEMICAL TANKER	35,731
ADRIATIC	B + H MARITIME SERVICES	ALTA SHIPPING	1971	NO(NIS)	BULK CARRIER	27,271
BORC	B + H MARITIME SERVICES	NEW BORG SHIPPING	1972	NO(NIS)	FREIGHTER	28,106
CONQUESTVENTURE	B + H MARITIME SERVICES	CONQUEST SHIPPING	1980	LI	CHEMICAL TANKER	31,766
SEAPEARL	B + H MARITIME SERVICES	SEAPEARL SHIPPING	1971	CY	FREIGHTER	31,889
R. PETER M. ELRICK	B + H MARITIME SERVICES	RPME SHIPPING	1972	LI	BULK CARRIER	27,273
ALEX	B + H MARITIME SERVICES	ALEX SHIPPING & ENTERPRISES	1973	LI	TANKER	30,607
TROLL	B + H MARITIME SERVICES	ROLL SHIPPING	1973	LI	BULK CARRIER	26,703
ARWA	B + H MARITIME SERVICES	PARADISE SHIPPING	1973	BH	BULK CARRIER	27,146
DIPPER	B + H MARITIME SERVICES	DIPPER	1974	NO(NIS)	FREIGHTER	38,613
BALTIC	B + H MARITIME SERVICES	BANA SHIPPING	1973	NO(NIS)	BULK CARRIER	26,703
CLIPPERVENTURE	B + H MARITIME SERVICES	CLIPPER SHIPHOLDINGS	1981	LI	CHEMICAL TANKER	31,745
MACLE	B + H MARITIME SERVICES	MACLE SHIPPING	1974	LI	TANKER	31,275
PORT ISABELLE	B + H MARITIME SERVICES	ISABELLE SHIPHOLDINGS	1982	KER	TANKER	40,632
TOKI	B + H MARITIME SERVICES	TOKI	1974	BH	FREIGHTER	38,914
COMMUTER	B + H MARITIME SERVICES	COMMUTER SHIPPING	1981	LI	TANKER	38,565
ANTWERPEN	B + H MARITIME SERVICES	NEW ANTWERPEN SHIPPING	1979	CY	BULK CARRIER	41,100
SKOWHEGAN	B + H MARITIME SERVICES	SKAUHOLT SHIPPING	1981	LI	TANKER	37,314
COURAGEVENTURE	B + H MARITIME SERVICES	COURAGE SHIPPING	1980	LI	CHEMICAL TANKER	31,729
OSTFRIESLAND	BAY TANKERS	JUTHA PHAKAKRONG SHIPPING	1978	SI	FREIGHTER	17,800
LAKE ONTARIO	BAY TANKERS	LAKE ONTARIO	1980	MI	BULK CARRIER	38,295
LAKE ERIE	BAY TANKERS	LAKE ERIE	1980	MI	BULK CARRIER	35,630
LAKE MICHIGAN	BAY TANKERS	LAKE MICHIGAN	1981	MI	BULK CARRIER	38,294
LAKE SUPERIOR	BAY TANKERS	LAKE SUPERIOR	1981	MI	BULK CARRIER	35,630

LAKE GEORGE	BAY TANKERS	LAKE GEORGE	1983	MI	BULK CARRIER	33,150
LAKE MEAD	BAY TANKERS	LAKE MEAD	1982	MI	BULK CARRIER	38,591
LAKE ST. CLAIR	BAY TANKERS	LAKE ST CLAIR	1983	MA	BULK CARRIER	41,796
LAKE CHARLES	BAY TANKERS	LAKE CHARLES	1990	MI	BULK CARRIER	26,209
LAKE CHAMPLAIN	BAY TANKERS	LAKE CHAMPLAIN	1992	MI	BULK CARRIER	26,264
LAKE CARLING	BAY TANKERS	LAKE CARLING	1992	MI	BULK CARRIER	26,264
NIKOS II	BERNUTH AGENCIES	NIKOS II	1969	PA	HEAVY-LIFT CARRIER	3,676
KORIMU	BERNUTH AGENCIES	BLACKWOOD INVESTMENTS	1970	PA	FREIGHTER	1,768
ISLAND INTREPID	BERNUTH AGENCIES	ISLAND INTREPID	1971	ANTIGU	CONTAINERSHIP	2,174
LINAKI	BERNUTH AGENCIES	LINAKI	1976	PA	FREIGHTER	1,131
POLYDINAMOS	BERNUTH AGENCIES	OLIMPIC CHARTERING	1978	PA	BULK CARRIER	24,329
LINA	BERNUTH AGENCIES	HAREHILL BUSINESS	1978	SV	BULK CARRIER	26,927
CHEVRON NAGASAKI	CALIFORNIA BANK	CALIFORNIA BANK	1974	BH	TANKER	268,243
CHARLES PIGOTT	CALIFORNIA BANK	CALIFORNIA BANK	1973	BH	TANKER	268,374
GEORGIA S	CHEMICAL BANKING	CHEMICAL TRUST	1981	PA	ORE CARRIER	30,187
CHEVRON ZENITH	CHEVRON	CHEVRON INTERNATIONAL	1972	MI	TANKER	96,711
CHEVRON FELUY	CHEVRON	CHEVRON TRANSPORT	1973	BH	TANKER	268,430
CHEVRON PERTH	CHEVRON	CHEVRON TRANSPORT	1975	BH	TANKER	276,838
CHEVRON SOUTH AMERICA	CHEVRON	CHEVRON TANKERS BERMUDA	1976	BA	TANKER	413,160
KENNETH E. HILL	CHEVRON	CHEVRON TRANSPORT	1979	BH	TANKER	81,274
CARLA A. HILLS	CHEVRON	CHEVRON TRANSPORT	1981	BH	TANKER	35,597
KENNETH T. DERR	CHEVRON	CHEVRON TRANSPORT	1982	BH	TANKER	35,026
RAYMOND E GALVIN	CHEVRON	CHEVRON TRANSPORT	1983	BH	TANKER	35,596
R. HAL DEAN	CHEVRON	CHEVRON TRANSPORT	1988	BH	TANKER	78,655
CHARLES B. RENFREW	CHEVRON	CHEVRON TRANSPORT	1988	BH	TANKER	78,657
JOHN YOUNG	CHEVRON	CHEVRON TRANSPORT	1990	BH	TANKER	155,547
J. DENNIS BONNEY	CHEVRON	CHEVRON TRANSPORT	1991	BH	TANKER	155,103
BRUCE SMART	CHEVRON	CHEVRON TRANSPORT	1991	BH	TANKER	155,150
WILLIAM E. CRAIN	CHEVRON	CALPETRO TANKERS BAHAMAS III	1992	LI	TANKER	155,127
CHEVRON ATLANTIC	CHEVRON	ACCESS ATLANTIC	1992	BH	TANKER	149,748
JAMES N. SULLIVAN	CHEVRON	CHEVRON TRANSPORT	1992	BH	TANKER	135,915
GEORGE SHULTZ	CHEVRON	CHEVRON TRANSPORT	1993	BH	TANKER	136,055
CONDOLEEZZA RICE	CHEVRON	CALPETRO TANKERS BAHAMAS II	1993	BH	TANKER	135,829
SAMUEL GINN	CHEVRON	CALPETRO TANKERS BAHAMAS I	1993	BH	TANKER	156,835
CHEVRON EMPLOYEE PRIDE	CHEVRON	CM PACIFIC MARITIME	1994	BH	TANKER	156,447

CHEVRON MARINER	CHEVRON	CALPETRO TANKERS IOM	1994	LI	TANKER	156,380
AMATA	CHIQUITA BRANDS	SCANREEFER MARINE	1991	CY	FISH CARRIER	6,232
ABAVA	CHIQUITA BRANDS	SCANREEFER NAVIGATION	1992	CY	FISH CARRIER	6,366
EDYTH L	CHIQUITA BRANDS	CRH SHIPPING	1990	BH	CONTAINERSHIP	15,672
FRANCES L	CHIQUITA BRANDS	KPT MARINE	1991	BH	CONTAINERSHIP	15,646
CHIQUITA FRANCES	CHIQUITA BRANDS	NORVEL	1992	BA	FREIGHTER/REFER	10,963
CHIQUITA JEAN	CHIQUITA BRANDS	NORVEL	1993	BA	FREIGHTER/REFER	11,831
CHIQUITA BRENDA	CHIQUITA BRANDS	NCV	1993	BA	FREIGHTER/REFER	11,793
CHIQUITA BREMEN	CHIQUITA BRANDS	BVS	1992	BA	FREIGHTER/REFER	12,890
CHIQUITA ROSTOCK	CHIQUITA BRANDS	BVS	1993	BA	FREIGHTER/REFER	12,850
COURTNEY L	CHIQUITA BRANDS	GPH SHIPPING	1992	BA	CONTAINERSHIP	15,593
CHIQUITA ELKE	CHIQUITA BRANDS	NORVEL	1994	BA	FREIGHTER/REFER	11,822
CHIQUITA JOY	CHIQUITA BRANDS	NCV	1994	BA	FREIGHTER/REFER	11,793
EAGLE	COLONIAL MARINE INDUSTRIES	EAGLE CARRIERS	1972	VA	BULK/CAR CARRIER	10,079
CARIB DAWN	COLONIAL MARINE INDUSTRIES	CARIB DAWN	1975	VA	FREIGHTER	2,997
CARIB ALBA	COLONIAL MARINE INDUSTRIES	CARIB ALBA	1976	VA	FREIGHTER	3,100
SNOW BIRD	COLONIAL MARINE INDUSTRIES	MIRAMAX SHIPPING	1979	CY	FREIGHTER	3,704
GGE RANGER	COLONIAL MARINE INDUSTRIES	PARNASS	1979	BH	FREIGHTER	10,800
ATL EXPLORER	COLONIAL MARINE INDUSTRIES	PARNASS	1980	BH	FREIGHTER	10,800
ROSELLEN	COLONIAL MARINE INDUSTRIES	ROSELLEN MARINE	1979	CY	RO/RO	3,545
WESTWIND	COLONIAL MARINE INDUSTRIES	WESTWIND SHIPPING	1983	BH	FREIGHTER	24,900
RACHEL	COLONIAL MARINE INDUSTRIES	BANYAN INVESTMENT GROUP	1985	BH	FREIGHTER	17,850
PIONEER	CONOCO	CIBC	1993	LI	TANKER	96,724
CONTINENTAL	CONOCO	CIBC	1993	LI	TANKER	96,683
RANDGRID	CONOCO	CONOCO SHIPPING NORGE NR2	1995	NO	TANKER	122,535
SENTINEL	CONOCO	UNKNOWN/CONOCO SHIPPING	1999	MI	TANKER	104,700
PROGRESS CARRIER I	CROWLEY MARITIME	RIG TENDERS INDONESIA	1982	IA	BULK CARRIER	6,412
TROPICAL LAND	DOLE FOOD	TROPICAL NAVIGATION MALTA	1972	MA	FREIGHTER/REFER	10,973
TROPICAL MIST	DOLE FOOD	DFFI SHIP FUNDING TRUST I	1986	LI	FREIGHTER/REFER	11,998
TROPICAL MORN	DOLE FOOD	DFFI SHIP FUNDING TRUST I	1986	LI	FREIGHTER/REFER	11,979
TROPICAL SKY	DOLE FOOD	DFFI SHIP FUNDING TRUST I	1986	LI	FREIGHTER/REFER	11,998
TROPICAL STAR	DOLE FOOD	DFFI SHIP FUNDING TRUST I	1986	LI	FREIGHTER/REFER	11,998
DOLE CALIFORNIA	DOLE FOOD	REEFERSHIP MARINE SERVICES	1988	IT	CONTAINERSHIP	11,800
DOLE ECUADOR	DOLE FOOD	REEFERSHIP MARINE SERVICES	1989	IT	CONTAINERSHIP	11,613
DOLE HONDURAS	DOLE FOOD	TROPICAL SHIPPING ITALIANA	1991	IT	CONTAINERSHIP	16,337
DOLE COSTARICA	DOLE FOOD	TROPICAL SHIPPING ITALIANA	1991	IT	CONTAINERSHIP	11,800
DOLE AMERICA	DOLE FOOD	DFFI SHIP FUNDING TRUST I	1994	LI	FREIGHTER/REFER	10,600
DOLE EUROPA	DOLE FOOD	DFFI SHIP FUNDING TRUST I	1994	LI	FREIGHTER/REFER	10,288

DOLE ASIA	DOLE FOOD	DFFI SHIP FUNDING TRUST I	1994	LI	FREIGHTER/REFER	10,288
DOLE AFRICA	DOLE FOOD	DFFI SHIP FUNDING TRUST I	1994	LI	FREIGHTER/REFER	10,282
IMPERIAL SKEENA	EXXON	IMPERIAL OIL	1970	CA	TANKER	4,856
PETRO MERSEY	EXXON	ESSO MARINE U.K.	1972	UK	TANKER	20,510
RICO	EXXON	ESSO ARGENTINA	1975	BH	TANKER	38,711
PETRO FIFE	EXXON	ESSO EXPLORATION	1977	UK	TANKER	125,457
BAYWAY	EXXON	ESSO ARGENTINA	1978	LI	TANKER	50,915
PALM BEACH	EXXON	ESSO ARGENTINA	1978	BH	TANKER	50,801
PETRO AVON	EXXON	ESSO MARINE U.K.	1981	UK	TANKER	3,215
RIO GRANDE	EXXON	ESSO ARGENTINA	1982	LI	TANKER	15,450
NEW HIDAKA	EXXON	ESSO SENPAKU/NAGATA	1995	JA	TANKER	4,783
NEW YOSHINO	EXXON	ESSO SENPAKU	1998	JA	TANKER	4,986
SUNBELT DIXIE	FAIRFIELD-MAXWELL	GREAT AMERICAN LINES	1978	LI	CAR CARRIER	12,730
HAKUFU	FAIRFIELD-MAXWELL	PURPLE LINE HOLDING	1987	PA	BULK CARRIER	26,682
YOHFU	FAIRFIELD-MAXWELL	SUN RIVER INVESTMENT	1987	PA	BULK CARRIER	26,712
KOHFU	FAIRFIELD-MAXWELL	HITORIO SHIPPING	1986	PA	FREIGHTER/REFER	6,544
KAIFU	FAIRFIELD-MAXWELL	SUN RIVER INVESTMENT	1988	PA	FREIGHTER/REFER	6,536
TENFU	FAIRFIELD-MAXWELL	APOLLO SHIPPING PROPERTIES	1988	PA	FREIGHTER/REFER	6,530
FAIRCHEM YONE	FAIRFIELD-MAXWELL	EURUS MARITIME	1995	PA	CHEMICAL TANKER	11,668
GOLDEN KAY	FAIRFIELD-MAXWELL	EURUS MARITIME	1996	PA	CHEMICAL TANKER	8,758
GOLDEN DIANE	FAIRFIELD-MAXWELL	EURUS MARITIME	1997	PA	CHEMICAL TANKER	8,742
FAIRCHEM VANGUARD	FAIRFIELD-MAXWELL	EURUS MARITIME	1999	PA	CHEMICAL TANKER	16,408
ALTA	GENERAL MARITIME	ALTA	1990	LI	TANKER	133,300
GENMAR GABRIEL	GENERAL MARITIME	GENMAR GABRIEL	1990	BA	TANKER	94,993
STENA COMMANDER	GENERAL MARITIME	NORD	1989	LI	TANKER	96,758
HARRIET	GENERAL MARITIME	HARRIET	1989	LI	TANKER	135,973
STAVANGER SUN	GENERAL MARITIME	STAVANGER SUN	1985	NO(NIS)	TANKER	89,636
GENMAR MINOTAUR	GENERAL MARITIME	GENMAR MINOTAUR	1995	LI	TANKER	96,225
GENMAR GEORGE	GENERAL MARITIME	PACIFIC TANKSHIP	1989	LI	TANKER	94,995
GENMAR CONSTANTINE	GENERAL MARITIME	GENMAR CONSTANTINE	1992	LI	TANKER	100,000
GENMAR AJAX	GENERAL MARITIME	GENMAR AJAX	1996	LI	TANKER	96,183
GENMAR AGAMEMNON	GENERAL MARITIME	GENMAR AGAMEMNON	1995	LI	TANKER	96,213
STAVANGER BOSS	GENERAL MARITIME	BOSS	1985	NO(NIS)	TANKER	89,600
MARTHA A	HILTVEIT ASSOCIATES	CAMBRIA TANKERS	1986	LI	CHEMICAL TANKER	13,500
RACHEL B	HILTVEIT ASSOCIATES	SUFFOLK TANKERS	1987	LI	CHEMICAL TANKER	13,749
RHINE FOREST	INTERNATIONAL SHIPHOLDING	FOREST LINES	1972	LI	CONTAINER/BARGE	44,799

SPRUCE	INTERNATIONAL SHIPHOLDING	LASH CARRIERS	1975	LI	CONTAINER/BARGE	8,172
AMAZON	INTERNATIONAL SHIPHOLDING	LCI SHIPHOLDINGS	1981	SI	BULK CARRIER	140,832
CYPRESS PASS	INTERNATIONAL SHIPHOLDING	CYPRESS AUTO CARRIERS	1988	LI	CAR CARRIER	12,763
HICKORY	INTERNATIONAL SHIPHOLDING	LCI SHIPHOLDINGS	1989	SV	CONTAINER/BARGE	40,796
ASIAN KING	INTERNATIONAL SHIPHOLDING	LCI SHIPHOLDINGS	1998	PA	CAR CARRIER	21,511
WILLOW	INTERNATIONAL SHIPHOLDING	LCI SHIPHOLDINGS	1987	LI	CONTAINER/BARGE	40,881
JAVA SEA	INTERNATIONAL SHIPHOLDING	GULF SOUTH SHIPPING	1988	SI	FREIGHTER	4,871
ASIAN EMPEROR	INTERNATIONAL SHIPHOLDING	LCI SHIPHOLDINGS	1999	PA	CAR CARRIER	21,479
BALI SEA	INTERNATIONAL SHIPHOLDING	GULF SOUTH SHIPPING	1982	SI	HEAVY-LIFT CARRIER	22,268
BANDA SEA	INTERNATIONAL SHIPHOLDING	GULF SOUTH SHIPPING	1982	SI	HEAVY-LIFT CARRIER	13,282
RED SEA SPIRIT	INTERNATIONAL SHIPHOLDING	TOLSON MARITIME	1977	PA	BULK CARRIER	17,556
ATLANTIC FOREST	INTERNATIONAL SHIPHOLDING	LCI SHIPHOLDINGS	1984	LI	CONTAINER/BARGE	40,881
RAFAEL	KEDMA	RAFAEL SHIPPING	1973	LI	BULK CARRIER	34,186
JOSHUA	KEDMA	JOSHUA SHIPPING	1976	LI	BULK CARRIER	34,410
SETTEBELLO	MARINE TRANSPORT	AMAZON TRANSPORT	1983	NO(NIS)	TANKER	322,446
HARBEL CUTLASS	MARINE TRANSPORT	L. & C. II	1980	LI	FREIGHTER	11,733
HARBEL TAPPER	MARINE TRANSPORT	L. & C. III	1981	LI	FREIGHTER	11,683
MARITIME OMI	MARINE TRANSPORT	HAYES NAVIGATION	1994	SI	BULK CARRIER	73,350
MARINE PACIFIC	MARINE TRANSPORT	MARINE PACIFIC	1979	LI	TANKER	404,531
MARINE ATLANTIC	MARINE TRANSPORT	MARINE ATLANTIC	1979	LI	TANKER	404,531
PATRIOT	MERIDIAN TRUST	MERIDIAN TRUST	1992	LI	TANKER	96,920
GUARDIAN	MERIDIAN TRUST	MERIDIAN TRUST	1992	LI	TANKER	96,920
MAGNOLIA	MOBIL OIL	MOBIL	1973	MI	TANKER	280,428
FALCON	MOBIL OIL	MOBIL	1976	MI	TANKER	284,089
ATHOS	MOBIL OIL	MOBIL OIL FRANCAISE	1974	FR	TANKER	276,221
D'ARTAGNAN	MOBIL OIL	MOBIL OIL FRANCAISE	1974	FR	TANKER	275,225
HARRIER	MOBIL OIL	MOBIL	1975	MI	TANKER	276,069
MATCO THAMES	MOBIL OIL	ENTERPRISE OIL & OTHERS	1975	UK	TANKER	89,398
WINAMAC	MOBIL OIL	MOBIL	1982	MI	TANKER	80,650
ROYAL ARROW	MOBIL OIL	MOBIL	1983	MI	CHEMICAL TANKER	39,776
SYLVAN ARROW	MOBIL OIL	MOBIL	1983	MI	CHEMICAL TANKER	39,731
WAPELLO	MOBIL OIL	MOBIL	1982	MI	TANKER	81,283
WANETA	MOBIL OIL	MOBIL	1982	MI	TANKER	81,282
SACONA	MOBIL OIL	MOBIL	1982	LI	TANKER	33,187
SAMOSET	MOBIL OIL	MOBIL	1982	MI	TANKER	33,235
SAUCON	MOBIL OIL	MOBIL	1983	MI	TANKER	38,452
MATCO CLYDE	MOBIL OIL	MATCO TANKERS	1982	UK	TANKER	81,944

WENATCHI	MOBIL OIL	MOBIL	1988	MI	TANKER	91,680
TASMAN	MOBIL OIL	PROBO	1990	AU	TANKER	35,367
EAGLE	MOBIL OIL	DUMOCO EAGLE TRUST	1993	MI	TANKER	284,493
RAVEN	MOBIL OIL	SAMOCO RAVEN TRUST	1996	MI	TANKER	301,653
KOMETIK	MOBIL OIL	MOBIL/CHEVRON/MURPHY	1997	CA	TANKER	126,646
OSPREY	MOBIL OIL	SAMOCO 1233 TRUST	1999	MI	TANKER	284,893
FLINDERS	MOBIL OIL	MOBIL	1982	PA	TANKER	149,235
ALREHAB	MOBIL OIL	SAMOCO 1234 TRUST	1999	MI	TANKER	301,620
VALIANT	MOBIL OIL	QATAR TANKER	1999	MI	TANKER	105,476
RAS LAFFAN	MOBIL OIL	QATAR TANKER	1999	MI	TANKER	105,424
CECILE ERICKSON	MORTON INTERNATIONAL	INAGUA TRANSPORTS	1957	SV	SALT CARRIER	5,588
SEABOARD STAR	NEW YORK BANK	NEW YORK BANK	1979	PA	RO/RO	12,161
SEABOARD FLORIDA	NEW YORK BANK	NEW YORK BANK	1979	PA	RO/RO	12,169
SEABOARD EXPRESS	NEW YORK BANK	NEW YORK BANK	1980	PA	RO/RO	10,208
ATLANTIA	OVERSEAS SHIPHOLDING	ATLANTIA TANKER	1979	MI	TANKER	96,920
VESTA	OVERSEAS SHIPHOLDING	OLERON TANKER	1980	PA	TANKER	81,278
VENUS V	OVERSEAS SHIPHOLDING	VENUS TANKER	1981	MI	TANKER	79,999
MARY ANN	OVERSEAS SHIPHOLDING	MARINA TANKER	1986	MI	TANKER	64,239
LUCY	OVERSEAS SHIPHOLDING	FIRST PRODUCTS TANKERS	1986	MI	TANKER	64,000
SUZANNE	OVERSEAS SHIPHOLDING	SECOND PRODUCTS TANKERS	1986	MI	TANKER	64,000
DIANE	OVERSEAS SHIPHOLDING	DIANE TANKER	1987	MI	TANKER	64,140
URANUS	OVERSEAS SHIPHOLDING	THIRD PRODUCTS TANKERS	1988	MI	TANKER	39,451
NEPTUNE	OVERSEAS SHIPHOLDING	FOURTH PRODUCTS TANKERS	1989	MI	TANKER	40,085
DELPHINA	OVERSEAS SHIPHOLDING	DELPHINA TANKER	1989	MI	TANKER	39,673
VEGA	OVERSEAS SHIPHOLDING	VEGA TANKER	1989	MI	TANKER	39,710
OLYMPIA	OVERSEAS SHIPHOLDING	OLYMPIA TANKER	1990	MI	TANKER	258,076
ECLIPSE	OVERSEAS SHIPHOLDING	ANIA TANKER	1989	MI	TANKER	135,134
REBECCA	OVERSEAS SHIPHOLDING	THIRD AFRAMAX TANKER	1994	MI	TANKER	94,872
BERYL	OVERSEAS SHIPHOLDING	FOURTH AFRAMAX TANKER	1994	MI	TANKER	93,302
PACIFIC SAPPHIRE	OVERSEAS SHIPHOLDING	SAPPHIRE TANKER	1994	MI	TANKER	96,173
PACIFIC RUBY	OVERSEAS SHIPHOLDING	RUBY TANKER	1994	MI	TANKER	84,999
ELIANE	OVERSEAS SHIPHOLDING	CARIBBEAN TANKER	1994	MI	TANKER	94,813
ANIA	OVERSEAS SHIPHOLDING	SARGASSO TANKER	1994	MI	TANKER	94,847
CROWN UNITY	OVERSEAS SHIPHOLDING	IMPERIAL TANKERS	1996	PA	TANKER	300,482
MAJESTIC UNITY	OVERSEAS SHIPHOLDING	ROYAL TANKERS	1996	PA	TANKER	300,549
EQUATORIAL LION	OVERSEAS SHIPHOLDING	FIRST UNION TANKER	1997	MI	TANKER	273,539
MERIDIAN LION	OVERSEAS SHIPHOLDING	SECOND UNION TANKER	1997	MI	TANKER	273,769
SOVEREIGN UNITY	OVERSEAS SHIPHOLDING	MAJESTIC TANKERS	1996	MI	TANKER	309,892
REGAL UNITY	OVERSEAS SHIPHOLDING	REGENCY TANKER	1997	MI	TANKER	309,966

CHRISMIR	OVERSEAS SHIPHOLDING	TUBARAO BULK CARRIERS	1997	MI	BULK CARRIER	159,829
MATILDE	OVERSEAS SHIPHOLDING	RIO GRANDE BULK CARRIERS	1997	MI	BULK CARRIER	160,013
PEREGRINE VI	R&B	R&B	1983	LI	ORE/BULK/OIL	129,017
PEREGRINE VIII	R&B	R&B	1977	BH	ORE/OIL CARRIER	125,200
RENAISSANCE SEVEN	RENAISSANCE CRUISES	RENAISSANCE CRUISES ANTIGUA	1991	LI	COMBO PASS &	645
RENAISSANCE EIGHT	RENAISSANCE CRUISES	RENAISSANCE CRUISES ANTIGUA	1992	LI	COMBO PASS &	681
R ONE	RENAISSANCE CRUISES	RENAISSANCE CRUISES LIBERIA	1998	LI	COMBO PASS &	2,700
R TWO	RENAISSANCE CRUISES	RENAISSANCE CRUISES LIBERIA	1998	LI	COMBO PASS &	2,700
R FIVE	RENAISSANCE CRUISES	RENAISSANCE CRUISES LIBERIA	2000	LI	COMBO PASS &	2,700
R FOUR	RENAISSANCE CRUISES	NAVIRE COPROPRIETE	1999	GI	COMBO PASS &	2,700
AFRICAN AZALEA	SEABOARD TRADING &	CARLOS SHIPPING	1978	LI	BULK CARRIER	8,986
AFRICAN BEGONIA	SEABOARD TRADING &	BUTTERCUP SHIPPING	1979	LI	BULK CARRIER	8,944
SEABOARD INTREPID	SEABOARD TRADING &	SEABOARD INTREPID	1980	PA	RO/RO	10,208
AFRICAN CAMELLIÀ	SEABOARD TRADING &	AFRICAN CAMELLIA SHIPPING	1980	LI	BULK CARRIER	8,991
AFRICAN DAHLIA	SEABOARD TRADING &	AFRICAN DAHLIA SHIPPING	1980	LI	BULK CARRIER	8,991
AFRICAN EVERGREEN	SEABOARD TRADING &	AFRICAN EVERGREEN	1981	LI	BULK CARRIER	9,122
AFRICAN FERN	SEABOARD TRADING &	AFRICAN FERN SHIPPING	1981	LI	BULK CARRIER	9,124
AFRICAN GARDENIA	SEABOARD TRADING &	AFRICAN GARDENIA SHIPPING	1981	LI	BULK CARRIER	9,101
SEABOARD VOYAGER	SEABOARD TRADING &	SEABOARD VOYAGER	1985	PA	RO/RO	11,294
SEABOARD VENTURE	SEABOARD TRADING &	SEABOARD VENTURE	1978	PA	RO/RO	3,506
MORANT BAY	SEABOARD TRADING &	SEABOARD MORANT BAY	1981	PA	RO/RO	2,813
MSC RIO GRANDE	SEAJADE MARITIME	MARATHOUNDA SHIPPING	1973	LI	FREIGHTER	32,629
SEVASTAKI	SEAJADE MARITIME	CLIPPER SEA TRANSPORTS	1984	LI	FREIGHTER	17,300
SEA-LAND FREEDOM	SEA-LAND SERVICE	FALCONHURST	1980	MI	CONTAINERSHIP	30,240
SEA-LAND MARINER	SEA-LAND SERVICE	MARINER	1980	MI	CONTAINERSHIP	35,955
AMERSHAM	SEA-LAND SERVICE	CHESHAM CONTAINERSHIPS	1980	UK	CONTAINERSHIP	9,663
SEA-LAND CHAMPION	SEA-LAND SERVICE	CHAMPION	1995	MI	CONTAINERSHIP	59,840
SEA-LAND COMET	SEA-LAND SERVICE	COMET	1995	MI	CONTAINERSHIP	59,840
SEA-LAND MERCURY	SEA-LAND SERVICE	MERCURY	1995	MI	CONTAINERSHIP	59,961
SEA-LAND METEOR	SEA-LAND SERVICE	METEOR	1996	MI	CONTAINERSHIP	59,940
SEA-LAND RACER	SEA-LAND SERVICE	RACER	1996	MI	CONTAINERSHIP	59,964
SEA-LAND CHARGER	SEA-LAND SERVICE	CHARGER	1997	MI	CONTAINERSHIP	59,961
SEA-LAND EAGLE	SEA-LAND SERVICE	EAGLE	1997	MI	CONTAINERSHIP	48,151
CTE ALICANTE	SEA-LAND SERVICE	CHESHAM CONTAINERSHIPS	1980	UK	CONTAINERSHIP	9,809
MELVIN H. BAKER	SKAARUP SHIPPING	BAY FAIR SHIPPING	1956	LI	ORE CARRIER	17,940
FARLAND	SKAARUP SHIPPING	BRIDGEWATER	1984	VA	BULK CARRIER	38,313
POLAR EAGLE	STATE STREET BANK & TRUST	STATE STREET BANK & TRUST	1993	LI	L.N.G. TANKER	48,817
ARCTIC SUN	STATE STREET BANK & TRUST	STATE STREET BANK & TRUST	1993	LI	L.N.G. TANKER	48,857
STAR OHIO	TEXACO	TEXACO PANAMA	1992	LI	TANKER	143,750

TROPIC PALM	TROPICAL SHIPPING	TROPICAL	1978	SV	RO/RO	4,810
TROPIC JADE	TROPICAL SHIPPING	BIRDSALL SHIPPING	1978	SV	RO/RO	2,536
TROPIC KEY	TROPICAL SHIPPING	BIRDSALL SHIPPING	1980	SV	FREIGHTER	2,530
TROPIC LURE	TROPICAL SHIPPING	BIRDSALL SHIPPING	1983	SV	FREIGHTER	2,563
TROPIC MIST	TROPICAL SHIPPING	BIRDSALL SHIPPING	1983	SV	RO/RO	2,563
TROPIC QUEST	TROPICAL SHIPPING	TROPICAL	1983	SV	RO/RO	9,989
TROPIC REIGN	TROPICAL SHIPPING	TROPICAL	1984	SV	RO/RO	9,793
TROPIC SUN	TROPICAL SHIPPING	BIRDSALL SHIPPING	1992	PA	FREIGHTER	7,450
TROPIC TIDE	TROPICAL SHIPPING	TROPICAL	1993	PA	RO/RO	7,430
WESTWOOD	WEYERHAEUSER	WESTWOOD SHIPPING	1986	BH	FREIGHTER	45,252
WESTWOOD BELINDA	WEYERHAEUSER	WESTWOOD SHIPPING	1986	BH	FREIGHTER	45,295
WESTWOOD CLEO	WEYERHAEUSER	WESTWOOD SHIPPING	1987	BH	FREIGHTER	45,295
WESTWOOD JAGO	WEYERHAEUSER	WESTWOOD SHIPPING	1987	BH	FREIGHTER	45,295
WESTWOOD ANETTE	WEYERHAEUSER	WESTWOOD SHIPPING	1987	BH	FREIGHTER	45,252
CARIGAS	WGS TRADING	PARK ROYAL FINANCES	1967	PA	L.P.G. TANKER	3,238

Source: MARAD List of Vessels Owned by U.S. Parent Companies as of April 2000 (over 1,000 GRT)

Number of Vessels = 273

Total DWT = 18,340,980

Average Age of Fleet = 15.0

Flag Codes

LI = Liberia
BH = Bahamas
CY = Cyprus
NO(NIS) = Norway(NIS)
SI = Singapore
PA = Panama
SV = Saint Vincent
VA = Vanuatu
UK = United Kingdom
MI = Marshall Islands
IA = Indonesia
CA = Canada
JA = Japan
FR = France
AU = Australia
GI = Gibraltar
KER = Kerguelen
IT = Italy
MA = Malta
BA = Bermuda
NO = Norway

Appendix B: MARAD Database of Militarily Useful, EUSC Tankers for January 2001

MARAD Database of Militarily Useful, EUSC Tankers for January 2001

Breakdown by Operator

OMI Marine Services LLC

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	GT
ALMA	OMI CORP	02	29,999	13.5	226,130	1989	No	No	18055
ELBE	OMI CORP	02	66,800	15	503,500	1984	No	No	38529
ISERE	OMI CORP	02	35,700	15	269,100	1999	**Yes**	N/A	22848
NECHES	OMI CORP	02	47,000	15.7	354,280	2000	**Yes**	N/A	28550
NILE	OMI CORP	02	66,808	15	503,500	1981	No	No	41471
SEINE	OMI CORP	02	34,750	15	261,900	1999	**Yes**	N/A	22848
SEVERN	OMI CORP	02	29,998	14.3	226,130	1988	No	No	18023
SHANNON	OMI CORP	02	29,999	14.3	226,130	1991	No	No	18105
PATRICIA	OMI CORP	33	29,035	15	176,000	1984	No	No	16820
PAULINA	OMI CORP	33	29,052	15	233,000	1984	No	No	16820
			399,141		2,979,670				

OMI Bulk Management Co.

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	GT
LIMAR	LIMAR SHIPPING LTD	02	29,999	14.3	276,759	1988	No	No	18055
VOLGA	VOLGA TRANSPORT INC	02	65,686	15.2	500,737	1981	No	No	41471
			95,685		777,496				

Exxon Corporation

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	GT
BAYWAY	ESSO SOCIEDAD ANONIMA PETROLER	02	50,915	16.2	357,000	1978	No	No	31677
PALM BEACH	ESSO SOCIEDAD ANONIMA PETROLER	02	50,801	16.3	364,000	1978	No	No	31677
RIO GRANDE	ESSO SOCIEDAD ANONIMA PETROLER	02	15,450	12.5	101,970	1982	No	No	10314
			117,166		822,970				

Maritime Overseas Corporation

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	GT

MARAD Database of Militarily Useful, EUSC Tankers for January 2001

DELPHINA	DELPHINA TANKER CORP	02	39,674	14	295,997	1989	No	Yes	22972
DIANE	DIANE TANKER CORP	02	64,140	14	464,424	1987	No	Yes	38241
LUCY	FIRST PRODUCT TANKERS INC	02	64,000	14	456,595	1986	No	Yes	36512
MARY ANN	MARINA TANKER CORP	02	64,239	14	464,424	1986	No	Yes	38241
NEPTUNE	FOURTH PRODUCT TANKERS INC	02	39,800	14	297,593	1989	No	Yes	22946
SUZANNE	SECOND PRODUCTS TANKERS INC	02	64,000	14	456,595	1986	No	Yes	36512
URANUS	THIRD PRODUCTS TANKERS INC	02	39,171	14	297,591	1988	No	Yes	22946
VEGA	VEGA TANKER CORP	02	39,674	14	296,011	1989	No	Yes	22972
ANIA	SARGASSO TANKER CORP (OSG Shipp	12	94,847	14.5	650,000	1994	Yes	N/A	53341
BERYL	FOURTH AFRAMAX TANKER CORP	12	94,799	14	666,321	1994	Yes	N/A	53341
ELIANE	CARIBBEAN TANKER CORP	12	94,813	14.5	666,321	1994	Yes	N/A	53341
ATLANTIA	ATLANTIA TANKER CORP	21	97,124	14.5	704,000	1979	No	No	48845
PACIFIC RUBY	RUBY TANKER CORP	21	84,999	15.5	676,014	1994	Yes	N/A	53830
PACIFIC SAPPHIRE	SAPPHIRE TANKER CORP	21	96,173	15.5	676,014	1994	Yes	N/A	53830
REBECCA	THIRD AFRAMAX TANKER CORP	21	94,872	14.5	666,321	1994	Yes	N/A	53341
VENUS V	VENUS TANKERS CORP	21	79,999	14.7	607,372	1981	No	No	50588
VESTA	OLERON TANKER SA	21	81,278	14.7	607,372	1980	No	No	50588
			1,233,602		8,948,965				

Mobil Shipping Co. Ltd.

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	GT
SACONA	MOBIL SHIPPING & TRANSPORTATION	02	33,187	15.3	261,879	1982	No	Yes	19580
SAMOSET	MOBIL SHIPPING & TRANSPORTATION	02	33,235	15.3	261,880	1982	No	Yes	19580
SAUCON	MOBIL SHIPPING & TRANSPORTATION	02	33,157	15.5	261,880	1983	No	Yes	19580
WINAMAC	MOBIL SHIPPING & TRANSPORTATION	12	80,650	15	631,788	1982	No	No	49639
WANETA	MOBIL SHIPPING & TRANSPORTATION	21	81,282	15	618,831	1982	No	No	50772
WAPELLO	MOBIL SHIPPING & TRANSPORTATION	21	81,283	15.7	618,831	1982	No	No	50772
WENATCHI	MOBIL SHIPPING CO LTD	21	91,680	15.5	615,000	1988	No	No	52159
ROYAL ARROW	MOBIL SHIPPING & TRANSPORTATION	33	39,776	15	295,618	1983	No	Yes	22587
SYLVAN ARROW	MOBIL SHIPPING & TRANSPORTATION	33	39,731	15	295,668	1983	No	Yes	22587
			513,981		3,861,375				

Fairfield-Maxwell Ltd.

MARAD Database of Militarily Useful, EUSC Tankers for January 2001

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	GT
FAIRCHEM VANGUARD	FAIRFIELD-MAXWELL LTD	33	16,408	14	119,000	1999	**Yes**	N/A	9149
			16,408		119,000				

Fairfield-Maxwell Services

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	GT
FAIRCHEM YONE	EURUS MARITIME SA	33	11,668	13	74,000	1995	**Yes**	N/A	6253
GOLDEN DIANE	EURUS MARITIME SA (dorval tankship)	33	8,400	13	61,000	1997	**Yes**	N/A	5357
			20,068		135,000				

General Maritme

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	GT
GENMAR GEORGE	GENERAL MARITIME CORP	12	94,995	14	687,280	1989	No	Yes	52521
GENMAR AGAMEMNON	GENERAL MARITIME CORP	21	96,213	13.5	645,000	1995	**Yes**	N/A	53829
GENMAR AJAX	GENERAL MARITIME CORP	21	96,183	14.2	645,000	1996	**Yes**	N/A	53829
GENMAR COMMANDER	GENERAL MARITIME CORP	21	96,758	14.2	648,000	1989	No	No	52247
GENMAR MINOTAUR	GENERAL MARITIME CORP	21	96,226	13.5	645,000	1995	**Yes**	N/A	53829
			480,375		3,270,280				

Conoco Inc. (TX)

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	GT
CONTINENTAL	CONOCO INC (TX)	12	98,231	14.9	710,700	1993	**Yes**	N/A	53648
PIONEER	CONOCO INC (TX)	21	96,724	14.9	648,000	1993	**Yes**	N/A	53848
			194,955		1,358,700				

Conoco Shipping

Vessel Characteristics

MARAD Database of Militarily Useful, EUSC Tankers for January 2001

SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	GT
GUARDIAN	MERIDIAN TRUST	21	96,920	14.8	668,000	1992	**Yes**	N/A	53772
PATRIOT	MERIDIAN TRUST	21	96,920	14.9	654,000	1992	**Yes**	N/A	53772
			193,840		1,322,000				

Chevron

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	GT
CARLA A HILLS	CHEVRON TRANSPORT CORP	02	35,596	14.9	275,000	1981	No	No	4821
CHARLES B RENFREW	CHEVRON TRANSPORT CORP	02	78,656	14	541,000	1988	No	No	44871
KENNETH T DERR	CHEVRON TRANSPORT CORP	02	36,157	14.9	275,000	1982	No	No	
R HAL DEAN	CHEVRON TRANSPORT CORP	02	78,656	14.8	600,000	1988	No	No	44871
RAYMOND E. GALVIN	CHEVRON TRANSPORT CORP	02	35,596	14.8	275,000	1983	No	No	23709
CHEVRON ZENITH	CHEVRON INTERNATIONAL LTD	21	96,716	15.5	748,000	1972	No	No	52459
KENNETH E HILL	CHEVRON TRANSPORT CORP	21	81,273	15.1	612,000	1979	No	No	50901
			442,650		3,326,000				

Dorval Kaiun

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	GT
GOLDEN KAY	EURUS MARITIME SA	33	8,758	13	639,000	1996	**Yes**	N/A	5819
			8,758		639,000				

Hiltveit Associates

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	GT
MARTHA A	CAMBRIA TANKERS	33	13,500	15	103,000	1986	No	No	7955
RACHEL B	SUFFOLK TANKERS	33	13,749	14	101,000	1987	No	No	7955
			27,249		204,000				

DWT = 3,743,878 **bbls =** 27,764,456

Number of Vessels = 63

MARAD Database of Militarily Useful, EUSC Tankers for January 2001

1 THE DEFINITION OF MILITARILY USEFUL FOLLOWED HERE IS: "All tankers, including integrated tug/barges (ITBs) and chemical carriers , capable of carrying petroleum, oil and lubricants (POL) with a capacity range from 2,000 to 100,000 DWT." A MINIMUM SPEED OF 12 KNOTS IS REQUIRED. (See CJCSI 3110.11B, 30 JAN 1996)

2 VESSEL TYPE CODES ARE: 02=PRODUCT TANKER, 12=PRODUCT TANKER, GREATER THAN 80,000 DWT, BUT, LESS THAN 100,000 DWT.
21=CRUDE CARRIER, 33=CHEMICAL TANKER

3 ONLY VESSELS LESS THAN OR EQUAL TO 25 YEARS OF AGE ARE INCLUDED IN THIS LIST.

Fleet by Type:

TOTAL PRODUCT TANKERS (< 80K) = 29
TOTAL PROD. TANKERS (>80K) = 6
TOTAL CRUDE CARRIERS = 18
TOTAL CHEMICAL TANKERS = 10
Total tankers = 63

Appendix C: U.S. Flag Tanker Fleet Database for February 2001 through 2016

U.S. FLAG TANKER FLEET DATABASE FOR FEBRUARY 2001

Double Hulled Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Hull	Type	Note
ANASAZI	SHIP	275,800	DH	CPP	
CAPTAIN H.A. DOWING	SHIP	275,800	DH	CPP	
CHEMICAL PIONEER	SHIP	214,830	DH	CHM	
CHEVRON ARIZONA	SHIP	275,016	DH	CPP	
CHEVRON COLORADO	SHIP	274,529	DH	CPP	
CHEVRON WASHINGTON	SHIP	274,468	DH	CPP	
DILIGENCE	SHIP	274,529	DH	CPP	
GUS W. DARNELL	SHIP	243,251	DH	CPP	MSC
HMI AMBROSSE CHANNEL	SHIP	341,459	DH	CPP	
HMI ASTRACHEM	SHIP	267,894	DH	CPP	
HMI BRETTON REEF	SHIP	341,459	DH	CPP	
SEABULK ARCTIC (ex-HMI Cape Lookout Shoals)	SHIP	341,459	DH	CPP	
SEABULK MARINER (ex-HMI Diamond Shoals)	SHIP	341,459	DH	CPP	
SEABULK PRIDE (ex-HMI Nantucket Shoals)	SHIP	341,459	DH	CPP	
INTEGRITY	SHIP	274,469	DH	CPP	
KENAI	SHIP	824,126	DH	Crude	size
LAWRENCE H. GIANELLA	SHIP	238,052	DH	CPP	MSC
MISSION CAPISTRANO	SHIP	306,587	DH	CPP	
NEW RIVER	SHIP	268,762	DH	CHM	
PAUL BUCK	SHIP	239,465	DH	CPP	MSC
PRINCE WILLIAM SOUND	SHIP	869,611	DH	Crude	size
RICHARD G. MATTHIESEN	SHIP	238,052	DH	CPP	MSC
S/R AMERICAN PROGRESS	SHIP	341,459	DH	CPP	
S/R GALVESTON	SHIP	198,981	DH	Crude	
SAMUEL L. COBB	SHIP	243,251	DH	CPP	MSC
THE MONSEIGNEUR	SHIP	268,762	DH	CHM	
TONSINA	SHIP	858,500	DH	Crude	size

# of vessels = 27

TOTAL CAPACITY IN BARRELS	9,253,489

Single Hulled/Double Sided/Double Bottomed Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Phase Out	Type	Note
COASTAL NEW YORK	SHIP	359,579	Jan-2001	CPP	age
PRUDHOE BAY	SHIP	451,811	Jan-2001	CPP	age
SAG RIVER	SHIP	478,986	May-2001	CPP	age
CHEVRON MISSISSIPPI	SHIP	499,728	Jan-2002	Crude	
COASTAL HOUSTON	SHIP	265,370	Dec-2002	CPP	
S/R BENICIA	SHIP	1,214,000	Mar-2002	Crude	size
S/R NORTH SLOPE	SHIP	1,214,408	Feb-2002	Crude	size
CHERRY VALLEY	SHIP	333,533	Jan-2003	CPP	
MORMACSTAR	SHIP	252,170	Jan-2003	CPP	

U.S. FLAG TANKER FLEET DATABASE FOR FEBRUARY 2001

MORMACSUN	SHIP	337,389	Jan-2003	CPP	
CHELSEA	SHIP	333,533	Jan-2003	CPP	
PATRIOT	SHIP	308,277	Apr-2003	CPP	
ROVER	SHIP	308,277	Dec-2003	CPP	
COURIER	SHIP	244,209	Jan-2004	CPP	
MARINE CHEMIST	SHIP	499,728	Jan-2004	CHM	
MORMACSKY	SHIP	257,309	Jan-2004	CPP	
OCEAN CITY	SHIP	620,356	Oct-2004	Crude	
OVERSEAS BOSTON	SHIP	929,348	Jan-2004	Crude	size
POLAR TEXAS	SHIP	622,609	Nov-2004	Crude	
ALLEGIANCE	SHIP	290,632	Jan-2005	CPP	
GUADALUPE	SHIP	223,227	Jan-2005	CPP	
COLORADO	SHIP	226,160	Jan-2005	CPP	
OVERSEAS CHICAGO	SHIP	676,046	Jun-2005	Crude	
OVERSEAS NEW YORK	SHIP	676,046	Dec-2005	Crude	
OVERSEAS OHIO	SHIP	676,046	Oct-2005	Crude	
FREDERICKSBURG	SHIP	317,060	Dec-2005	CPP	
HMI DEFENDER	SHIP	260,548	Aug-2008	CPP	
OVERSEAS NEW ORLEANS	SHIP	306,690	Jun-2008	CPP	
POLAR CALIFORNIA	SHIP	1,348,632	Jul-2008	Crude	size
ASPHALT COMMANDER	SHIP	228,669	Jan-2009	Specialty	impractical
S/R MEDITERRANEAN	SHIP	1,484,829	Dec-2009	Crude	size
B. T. ALASKA	SHIP	1,348,632	Mar-2006	Crude	size
CHILBAR	SHIP	298,379	May-2006	CHM	
COASTAL EAGLE POINT	SHIP	362,494	Oct-2006	CPP	
DENALI	SHIP	1,305,471	Oct-2006	Crude	size
MARINE COLUMBIA	SHIP	359,579	Nov-2006	Crude	
OVERSEAS WASHINGTON	SHIP	676,046	Mar-2006	Crude	
PERSEVERANCE	SHIP	247,778	Dec-2006	CPP	
SMT CHEMICAL EXPLORER	SHIP	271,263	Sep-2006	CHM	ITB
SMT ONE	SHIP	271,263	Sep-2006	CHM	ITB
POLAR ALASKA	SHIP	1,348,632	Dec-2007	Crude	size
S/R LONG BEACH	SHIP	1,484,829	Jan-2010	Crude	size
BLUE RIDGE	SHIP	300,978	Jul-2011	CPP	
COAST RANGE	SHIP	306,897	Sep-2011	CPP	
HMI DYNACHEM	SHIP	368,252	Sep-2011	CPP	
KEYSTONE TEXAS	SHIP	306,913	Dec-2011	CPP	
HMI PETROCHEM	SHIP	368,252	Dec-2011	CHM	
CHESAPEAKE TRADER	SHIP	356,102	Jan-2012	Crude	
ITB GROTON	ITB	383,502	Jun-2012	CPP	ITB
ITB JACKSONVILLE	ITB	383,502	May-2012	CPP	ITB
OVERSEAS PHILADELPHIA	SHIP	306,690	May-2012	CPP	
POLAR TRADER	SHIP	356,102	Dec-2012	Crude	
S/R BAYTOWN	SHIP	459,370	Aug-2012	Crude	
ITB BALTIMORE	ITB	383,502	May-2013	CPP	ITB
ITB NEW YORK	ITB	383,502	Feb-2013	CPP	ITB
S/R PUGET SOUND	SHIP	363,369	May-2013	Crude	
S/R CHARLESTON	SHIP	380,227	Oct-2013	CHM	
SEA VENTURE	SHIP	137,830	Jan-2013	Crude	
ITB MOBILE	ITB	383,502	Aug-2014	CPP	ITB

U.S. FLAG TANKER FLEET DATABASE FOR FEBRUARY 2001

ITB PHILADELPHIA	ITB	383,502	Jun-2014	CPP	ITB
S/R WILMINGTON	SHIP	377,270	Jun-2014	CHM	
SEA ISLE CITY	SHIP	613,629	Jan-2015	Crude	
SEABULK AMERICA	SHIP	297,573	Jan-2015	CHM	
CHESAPEAKE CITY	SHIP	620,356	Jan-2015	Crude	

# of vessels = 64

Total capacity = 32,440,393

total ships = 91

Additional Tug-Barge Combinations

	Vsl Type	Barrels	Phase Out	Type	Note
VIRGINA BAY	ATB	180,035	1/1/07	CHM	ATB
SOUTH CAROLINA BAY	ATB	180,035	3/11/07	CHM	ATB
TALLAHASSEE BAY/FLORIDA BAY	ATB	180,036	8/1/06	CPP	ATB

# of barges = 3

Total capacity = 540,106 barrels

Total capacity of fleet (barrels) =	**42,233,988**
Total approx. DWT of fleet =	**5,948,449**
Total # of vessels in fleet =	**94**

Fleet Breakdown:

	#	# DH
Crude Carriers	28	4
Product Tankers	52	20
Chemical Carriers	13	3
Specialty Tankers	1	0
Totals =	94	27

Notes: The comments are included regarding the justification for the vessel's removal from the militarily useful list.

U.S. FLAG, MILITARILY USEFUL TANKER FLEET DATABASE FOR JULY 2001

Double Hulled Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Hull	Type
ANASAZI	SHIP	275,800	DH	CPP
CAPTAIN H.A. DOWING	SHIP	275,800	DH	CPP
CHEMICAL PIONEER	SHIP	214,830	DH	CHM
CHEVRON ARIZONA	SHIP	275,016	DH	CPP
CHEVRON COLORADO	SHIP	274,529	DH	CPP
CHEVRON WASHINGTON	SHIP	274,468	DH	CPP
DILIGENCE	SHIP	274,529	DH	CPP
HMI AMBROSSE CHANNEL	SHIP	341,459	DH	CPP
HMI ASTRACHEM	SHIP	267,894	DH	CPP
HMI BRETTON REEF	SHIP	341,459	DH	CPP
SEABULK ARCTIC (ex-HMI Cape Lookout Shoals)	SHIP	341,459	DH	CPP
SEABULK MARINER (ex-HMI Diamond Shoals)	SHIP	341,459	DH	CPP
SEABULK PRIDE (ex-HMI Nantucket Shoals)	SHIP	341,459	DH	CPP
INTEGRITY	SHIP	274,469	DH	CPP
MISSION CAPISTRANO	SHIP	306,587	DH	CPP
NEW RIVER	SHIP	268,762	DH	CHM
S/R AMERICAN PROGRESS	SHIP	341,459	DH	CPP
S/R GALVESTON	SHIP	198,981	DH	Crude
THE MONSEIGNEUR	SHIP	268,762	DH	CHM

# of vessels = 19

TOTAL CAPACITY IN BARRELS	5,499,181

Single Hulled/Double Sided/Double Bottomed Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Phase Out	Type
CHEVRON MISSISSIPPI	SHIP	499,728	Jan-2002	Crude
COASTAL HOUSTON	SHIP	265,370	Dec-2002	CPP
CHERRY VALLEY	SHIP	333,533	Jan-2003	CPP
MORMACSTAR	SHIP	252,170	Jan-2003	CPP
MORMACSUN	SHIP	337,389	Jan-2003	CPP
CHELSEA	SHIP	333,533	Jan-2003	CPP
PATRIOT	SHIP	308,277	Apr-2003	CPP
ROVER	SHIP	308,277	Dec-2003	CPP
COURIER	SHIP	244,209	Jan-2004	CPP
MARINE CHEMIST	SHIP	499,728	Jan-2004	CHM
MORMACSKY	SHIP	257,309	Jan-2004	CPP
OCEAN CITY	SHIP	620,356	Oct-2004	Crude
POLAR TEXAS	SHIP	622,609	Nov-2004	Crude
ALLEGIANCE	SHIP	290,632	Jan-2005	CPP
GUADALUPE	SHIP	223,227	Jan-2005	CPP
COLORADO	SHIP	226,160	Jan-2005	CPP
OVERSEAS CHICAGO	SHIP	676,046	Jun-2005	Crude
OVERSEAS NEW YORK	SHIP	676,046	Dec-2005	Crude

U.S. FLAG, MILITARILY USEFUL TANKER FLEET DATABASE FOR JULY 2001

OVERSEAS OHIO	SHIP	676,046	Oct-2005	Crude
FREDERICKSBURG	SHIP	317,060	Dec-2005	CPP
HMI DEFENDER	SHIP	260,548	Aug-2008	CPP
OVERSEAS NEW ORLEANS	SHIP	306,690	Jun-2008	CPP
CHILBAR	SHIP	298,379	May-2006	CHM
COASTAL EAGLE POINT	SHIP	362,494	Oct-2006	CPP
MARINE COLUMBIA	SHIP	359,579	Nov-2006	Crude
OVERSEAS WASHINGTON	SHIP	676,046	Mar-2006	Crude
PERSEVERANCE	SHIP	247,778	Dec-2006	CPP
BLUE RIDGE	SHIP	300,978	Jul-2011	CPP
COAST RANGE	SHIP	306,897	Sep-2011	CPP
SEABULK TRADER (ex-HMI Dynachem)	SHIP	368,252	Sep-2011	CPP
KEYSTONE TEXAS	SHIP	306,913	Dec-2011	CPP
SEABULK CHALLENGE (ex-HMI Petrochem)	SHIP	368,252	Dec-2011	CHM
S/R GALENA BAY (ex-Chesapeake Trader)	SHIP	356,102	Jan-2012	Crude
OVERSEAS PHILADELPHIA	SHIP	306,690	May-2012	CPP
POLAR TRADER	SHIP	356,102	Dec-2012	Crude
S/R BAYTOWN	SHIP	459,370	Aug-2012	Crude
S/R PUGET SOUND	SHIP	363,369	May-2013	Crude
S/R CHARLESTON	SHIP	380,227	Oct-2013	CHM
SEA VENTURE	SHIP	137,830	Jan-2013	Crude
S/R WILMINGTON	SHIP	377,270	Jun-2014	CHM
SEA ISLE CITY	SHIP	613,629	Jan-2015	Crude
SEABULK AMERICA	SHIP	297,573	Jan-2015	CHM
CHESAPEAKE CITY	SHIP	620,356	Jan-2015	Crude

# of vessels = 43

Total capacity = 16,399,029

Total capacity of fleet (barrels) =	**21,898,210**
Total approx. DWT of fleet =	**3,084,255**
Total # of vessels in fleet =	**62**

MU Fleet Breakdown:

	#	# DH
Crude Carriers =	16	1
Product Tankers =	37	15
Chemical Carriers =	9	3
Specialty Tankers =	0	0
Totals =	62	19

U.S. FLAG, MILITARILY USEFUL TANKER FLEET DATABASE FOR 2006

Double Hulled Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Hull	Type
ANASAZI	SHIP	275,800	DH	CPP
CAPTAIN H.A. DOWING	SHIP	275,800	DH	CPP
CHEMICAL PIONEER	SHIP	214,830	DH	CHM
CHEVRON ARIZONA	SHIP	275,016	DH	CPP
CHEVRON COLORADO	SHIP	274,529	DH	CPP
CHEVRON WASHINGTON	SHIP	274,468	DH	CPP
DILIGENCE	SHIP	274,529	DH	CPP
HMI AMBROSSE CHANNEL	SHIP	341,459	DH	CPP
HMI ASTRACHEM	SHIP	267,894	DH	CPP
HMI BRETTON REEF	SHIP	341,459	DH	CPP
SEABULK ARCTIC (ex-HMI Cape Lookout Shoals)	SHIP	341,459	DH	CPP
SEABULK MARINER (ex-HMI Diamond Shoals)	SHIP	341,459	DH	CPP
SEABULK PRIDE (ex-HMI Nantucket Shoals)	SHIP	341,459	DH	CPP
INTEGRITY	SHIP	274,469	DH	CPP
MISSION CAPISTRANO	SHIP	306,587	DH	CPP
NEW RIVER	SHIP	268,762	DH	CHM
S/R AMERICAN PROGRESS	SHIP	341,459	DH	CPP
S/R GALVESTON	SHIP	198,981	DH	Crude
THE MONSEIGNEUR	SHIP	268,762	DH	CHM

# of vessels = 19

TOTAL CAPACITY IN BARRELS	5,499,181

Single Hulled/Double Sided/Double Bottomed Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Phase Out	Type
HMI DEFENDER	SHIP	260,548	Aug-2008	CPP
OVERSEAS NEW ORLEANS	SHIP	306,690	Jun-2008	CPP
CHILBAR	SHIP	298,379	May-2006	CHM
COASTAL EAGLE POINT	SHIP	362,494	Oct-2006	CPP
MARINE COLUMBIA	SHIP	359,579	Nov-2006	Crude
OVERSEAS WASHINGTON	SHIP	676,046	Mar-2006	Crude
PERSEVERANCE	SHIP	247,778	Dec-2006	CPP
BLUE RIDGE	SHIP	300,978	Jul-2011	CPP
COAST RANGE	SHIP	306,897	Sep-2011	CPP
SEABULK TRADER (ex-HMI Dynachem)	SHIP	368,252	Sep-2011	CPP
KEYSTONE TEXAS	SHIP	306,913	Dec-2011	CPP
SEABULK CHALLENGE (ex-HMI Petrochem)	SHIP	368,252	Dec-2011	CHM
S/R GALENA BAY (ex-Chesapeake Trader)	SHIP	356,102	Jan-2012	Crude
OVERSEAS PHILADELPHIA	SHIP	306,690	May-2012	CPP
POLAR TRADER	SHIP	356,102	Dec-2012	Crude
S/R BAYTOWN	SHIP	459,370	Aug-2012	Crude
S/R PUGET SOUND	SHIP	363,369	May-2013	Crude

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S/R CHARLESTON	SHIP	380,227	Oct-2013	CHM
SEA VENTURE	SHIP	137,830	Jan-2013	Crude
S/R WILMINGTON	SHIP	377,270	Jun-2014	CHM
SEA ISLE CITY	SHIP	613,629	Jan-2015	Crude
SEABULK AMERICA	SHIP	297,573	Jan-2015	CHM
CHESAPEAKE CITY	SHIP	620,356	Jan-2015	Crude

# of vessels = 23

Total capacity = 8,431,324

Total capacity of fleet (barrels) =	**13,930,505**
Total approx. DWT of fleet =	**1,962,043**
Total # of vessels in fleet =	**42**

MU Fleet Breakdown:

	#	# DH
Crude Carriers =	10	1
Product Tankers =	24	15
Chemical Carriers =	8	3
Specialty Tankers =	0	0
Totals =	42	19

Double Hulled Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Hull	Type
ANASAZI	SHIP	275,800	DH	CPP
CAPTAIN H.A. DOWING	SHIP	275,800	DH	CPP
CHEMICAL PIONEER	SHIP	214,830	DH	CHM
CHEVRON ARIZONA	SHIP	275,016	DH	CPP
CHEVRON COLORADO	SHIP	274,529	DH	CPP
CHEVRON WASHINGTON	SHIP	274,468	DH	CPP
DILIGENCE	SHIP	274,529	DH	CPP
HMI AMBROSSE CHANNEL	SHIP	341,459	DH	CPP
HMI ASTRACHEM	SHIP	267,894	DH	CPP
HMI BRETTON REEF	SHIP	341,459	DH	CPP
SEABULK ARCTIC (ex-HMI Cape Lookout Shoals)	SHIP	341,459	DH	CPP
SEABULK MARINER (ex-HMI Diamond Shoals)	SHIP	341,459	DH	CPP
SEABULK PRIDE (ex-HMI Nantucket Shoals)	SHIP	341,459	DH	CPP
INTEGRITY	SHIP	274,469	DH	CPP
MISSION CAPISTRANO	SHIP	306,587	DH	CPP
NEW RIVER	SHIP	268,762	DH	CHM
S/R AMERICAN PROGRESS	SHIP	341,459	DH	CPP
S/R GALVESTON	SHIP	198,981	DH	Crude
THE MONSEIGNEUR	SHIP	268,762	DH	CHM

# of vessels = 19

TOTAL CAPACITY IN BARRELS	5,499,181

Single Hulled/Double Sided/Double Bottomed Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Phase Out	Type
BLUE RIDGE	SHIP	300,978	Jul-2011	CPP
COAST RANGE	SHIP	306,897	Sep-2011	CPP
SEABULK TRADER (ex-HMI Dynachem)	SHIP	368,252	Sep-2011	CPP
KEYSTONE TEXAS	SHIP	306,913	Dec-2011	CPP
SEABULK CHALLENGE (ex-HMI Petrochem)	SHIP	368,252	Dec-2011	CHM
S/R GALENA BAY (ex-Chesapeake Trader)	SHIP	356,102	Jan-2012	Crude
OVERSEAS PHILADELPHIA	SHIP	306,690	May-2012	CPP
POLAR TRADER	SHIP	356,102	Dec-2012	Crude
S/R BAYTOWN	SHIP	459,370	Aug-2012	Crude
S/R PUGET SOUND	SHIP	363,369	May-2013	Crude
S/R CHARLESTON	SHIP	380,227	Oct-2013	CHM
SEA VENTURE	SHIP	137,830	Jan-2013	Crude
S/R WILMINGTON	SHIP	377,270	Jun-2014	CHM
SEA ISLE CITY	SHIP	613,629	Jan-2015	Crude
SEABULK AMERICA	SHIP	297,573	Jan-2015	CHM
CHESAPEAKE CITY	SHIP	620,356	Jan-2015	Crude

# of vessels = 16
Total capacity = 5,919,810

Total capacity of fleet (barrels) =	**11,418,991**
Total approx. DWT of fleet =	**1,608,309**
Total # of vessels in fleet =	**35**

MU Fleet Breakdown:

	#	# DH
Crude Carriers =	8	1
Product Tankers =	20	15
Chemical Carriers =	7	3
Specialty Tankers =	0	0
Totals =	35	19

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Double Hulled Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Hull	Type
ANASAZI	SHIP	275,800	DH	CPP
CAPTAIN H.A. DOWING	SHIP	275,800	DH	CPP
CHEMICAL PIONEER	SHIP	214,830	DH	CHM
CHEVRON ARIZONA	SHIP	275,016	DH	CPP
CHEVRON COLORADO	SHIP	274,529	DH	CPP
CHEVRON WASHINGTON	SHIP	274,468	DH	CPP
DILIGENCE	SHIP	274,529	DH	CPP
HMI AMBROSSE CHANNEL	SHIP	341,459	DH	CPP
HMI ASTRACHEM	SHIP	267,894	DH	CPP
HMI BRETTON REEF	SHIP	341,459	DH	CPP
SEABULK ARCTIC (ex-HMI Cape Lookout Shoals)	SHIP	341,459	DH	CPP
SEABULK MARINER (ex-HMI Diamond Shoals)	SHIP	341,459	DH	CPP
SEABULK PRIDE (ex-HMI Nantucket Shoals)	SHIP	341,459	DH	CPP
INTEGRITY	SHIP	274,469	DH	CPP
MISSION CAPISTRANO	SHIP	306,587	DH	CPP
NEW RIVER	SHIP	268,762	DH	CHM
S/R AMERICAN PROGRESS	SHIP	341,459	DH	CPP
S/R GALVESTON	SHIP	198,981	DH	Crude
THE MONSEIGNEUR	SHIP	268,762	DH	CHM

# of vessels = 19

TOTAL CAPACITY IN BARRELS	5,499,181

Single Hulled/Double Sided/Double Bottomed Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Phase Out	Type

# of vessels = 0

Total capacity = 0

Total capacity of fleet (barrels) =	**5,499,181**
Total approx. DWT of fleet =	**774,533**
Total # of vessels in fleet =	**19**

U.S. FLAG, MILITARILY USEFUL TANKER FLEET DATABASE FOR 2016

MU Fleet Breakdown:

	#	# DH
Crude Carriers =	1	1
Product Tankers =	15	15
Chemical Carriers =	3	3
Specialty Tankers =	0	0
Totals =	19	19

Appendix D: MARAD Militarily Useful, EUSC Tanker Database for January 2002

MARAD Militarily Useful, EUSC Tanker Fleet for January 2002 - Listing by Operator

Alcoa Steamship Co., Inc.

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL OWNER	NOTES
MARLIN	1977	78	LI	15000	13	ALCOA STEAMSHIP CO INC	EUSC Qualifier
TARPON	1977	78	LI	15000	13.5	ALCOA STEAMSHIP CO INC	EUSC Qualifier

ChevronTexaco Shipping Co.

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL OWNER	NOTES
AGAWAM (ex-Kenneth T. Derr)	1982	02	BF	35026	14.9	CHEVRON CORP	Sold to B&H, not a U.S.company
CHARLES B RENFREW	1988	02	BF	78656	14	CHEVRON TRANSPORTATION CORP	EUSC Qualifier
R HAL DEAN	1988	02	BF	78656	14.8	CHEVRON TRANSPORTATION CORP	EUSC Qualifier
RAYMOND E. GALVIN	1983	02	BF	35596	14.8	CHEVRON CORP	Sold to B&H, not a U.S.company
CHEVRON ZENITH	**1972**	21	RM	96716	15.5	CHEVRON INTERNATIONAL LTD	EUSC Qualifier; storage vessel in Africa
KENNETH E HILL	1979	21	BF	81273	15.1	CHEVRON CORP	EUSC Qualifier; to be sold for scrap soon

Conoco Shipping Co.

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL OWNER	NOTES
CONTINENTAL	1993	12	LI	98231	14.9	CONOCO SHIPPING CO	EUSC Qualifier
GUARDIAN	1992	21	LI	96920	14.8	CONOCO SHIPPING CO	EUSC Qualifier
PATRIOT	1992	21	LI	96920	14.9	CONOCO SHIPPING CO	EUSC Qualifier
PIONEER	1993	21	LI	96724	14.9	CONOCO SHIPPING CO	EUSC Qualifier

El Paso Marine Co.

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL OWNER	NOTES
ARUBA	1980	02	LI	69118	15	EL PASO CORP	EUSC Qualifier

ESSO SAPA

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL OWNER	NOTES
PALM BEACH	1978	02	BF	50801	16.3	ESSO SAPA*	EUSC Qualifier
RIO GRANDE	1982	02	LI	15450	12.5	ESSO SOCIEDAD ANONIMA PETROLERA ARGINTIN	EUSC Qualifier
BAYWAY	1978	12	LI	50915	16.2	ESSO SOCIEDAD ANONIMA PETROLERA ARGINTIN	EUSC Qualifier

MARAD Militarily Useful, EUSC Tanker Fleet for January 2002 - Listing by Operator

International Marine Transportation

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL OWNER	NOTES
ROYAL ARROW	1983	33	RM	39776	15	INTL MARINE TRANSPORTATION (MOBIL)	Sold to foreign interests

OMI Corporation

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL OWNER	NOTES
ASHLEY		33	ML	37270	15	OMI CORP	Marshall Islands Corporation; not EUSC
CHARENTE		33	ML	35751	15	OMI CORP	Marshall Islands Corporation; not EUSC
MARNE		33	ML	37230	15	OMI CORP	Marshall Islands Corporation; not EUSC
OHIO		33	ML	37000	15	OMI CORP	Marshall Islands Corporation; not EUSC

OMI Marine Services LLC

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL OWNER	NOTES
ALMA		02	LI	29999	13.5	OMI CORP	Marshall Islands Corporation; not EUSC
ELBE		02	LI	66800	15	OMI CORP	Marshall Islands Corporation; not EUSC
GUADALUPE		02	LI	47000	15.7	OMI CORP	Marshall Islands Corporation; not EUSC
ISERE		02	ML	35600	15	OMI CORP	Marshall Islands Corporation; not EUSC
LIMAR		02	LI	29999	14	OMI CORP	Marshall Islands Corporation; not EUSC
NECHES		02	ML	47052	15.7	OMI CORP	Marshall Islands Corporation; not EUSC
NILE		02	LI	66808	15	OMI CORP	Marshall Islands Corporation; not EUSC
RACER		02	LI	29998	14	OMI CORP	Marshall Islands Corporation; not EUSC
RAIN		02	LI	29998	14.3	OMI CORP	Marshall Islands Corporation; not EUSC
SEINE		02	ML	34750	15	OMI CORP	Marshall Islands Corporation; not EUSC
SEVERN		02	LI	29998	14.3	OMI CORP	Marshall Islands Corporation; not EUSC
SHANNON		02	LI	29999	14.3	OMI CORP	Marshall Islands Corporation; not EUSC
VOLGA		02	LI	65689	15	OMI CORP	Marshall Islands Corporation; not EUSC
PATRICIA		33	LI	29035	15	OMI CORP	Marshall Islands Corporation; not EUSC
PAULINA		33	LI	29052	15	OMI CORP	Marshall Islands Corporation; not EUSC
RHONE		33	ML	35769	15	OMI CORP	Marshall Islands Corporation; not EUSC

MARAD Militarily Useful, EUSC Tanker Fleet for January 2002 - Listing by Operator

OSG Ship Management, Inc.

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL OWNER	NOTES
DELPHINA	1989	02	RM	39674	14	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier
DIANE	1987	02	RM	64140	14	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier
LUCY	1986	02	RM	64000	14	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier
MARY ANN	1986	02	RM	64239	14	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier
NEPTUNE	1989	02	RM	39800	14	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier
SUZANNE	1986	02	RM	64000	14	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier
URANUS	1988	02	RM	39171	14	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier
VEGA	1989	02	RM	39674	14	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier
ANIA	1994	12	RM	94847	14.5	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier
BERYL	1994	12	RM	94799	14	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier
ELIANE	1994	12	RM	94813	14.5	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier
PACIFIC RUBY	1994	21	RM	84999	15.5	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier
PACIFIC SAPPHIRE	1994	21	RM	96173	15.5	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier
REBECCA	1994	21	RM	94872	14.5	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier
VENUS V	1981	21	RM	79999	14.7	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier
VESTA	1980	21	PM	81278	14.7	OVERSEAS SHIPHOLDING GROUP	EUSC Qualifier

PCS Phosphate

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL OWNER	NOTES
AURORA	2000	33	ML	24668	15	PCS PHOSPHATE	Owner confirms not EUSC Qualified

Pertamina

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL OWNER	NOTES
BANDAR AYU	1993	21	PM	36345	15.3	OMI CORP	Owned by OMI a Marshall Islands co.
TANDJUNG AYU	1993	21	PM	36362	15.4	OMI CORP	Owned by OMI a Marshall Islands co.

Ravenscroft Shipping Inc.

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL OWNER	NOTES
CARLISLE	1986	02	PM	83970	14.3	RAVENSCROFT SHIPPING INC	Not a shipowner; Panamanian owned
ABBEYDALE	1976	21	PM	60840	15.2	RAVENSCROFT SHIPPING INC	Not a shipowner; Panamanian owned
PRINCESS LAURA	1982	21	PM	67069	14.5	RAVENSCROFT SHIPPING INC	Not a shipowner; Panamanian owned

MARAD Militarily Useful, EUSC Tanker Fleet for January 2002 - Listing by Operator

GLENBUCK	1987	78	PM	98754	15	RAVENSCROFT SHIPPING INC	Not a shipowner; Panamanian owned
LYNNCRAIG	1986	78	PM	98358	15	RAVENSCROFT SHIPPING INC	Not a shipowner; Panamanian owned

Seaarland Shipping Management

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL OWNER	NOTES
MADISON	2000	02	LI	35833	14.2	Madison Shipping LLC / OMI CORP	Owned by OMI a Marshall Islands co.

V Ships USA, Inc. (Florida)

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL OWNER	NOTES
CLEMENT	1976	02	BF	59650	16	PLM INTERNATIONAL	EUSC Qualifier; PLM a U.S. company

Codes:
02 -> Product Tankers < 80,000 dwt
12 -> Product Tankers > 80,000 dwt
21 -> Crude tankers
33 -> Chemical carriers
78 -> OBO

Total Vessels in Fleet = 63

Total DWT of fleet = 2,996,856

Notes from Investigation of Operating Companies Listed in MARAD's January 2002 Database of Militarily Useful, EUSC Tankers

Notes:

We received a MARAD database of EUSC, militarily useful tankers in January 2002. The previous database was for January 2001. We used the following defintion of militarily useful in this report:

- Vessels must possess size between 2,000 and 100,000 dwt
- Vessels must possess speed of 12-knots or greater

We investigated each company in the MARAD database by contacting a current or former employee of each firm. Discussions covered EUSC status, current and future additions and deletions, crews, hull type, and cargo tank coatings. The following list describes the vessels listed in this database:

1) Alcoa Steamship Co., Inc. - This operating company was not present on the Marad EUSC list for 2001. The vessels that Alcoa Steamship operates are owned by Lib-Ore Steamship Company, which is a Liberian company owned by Alcoa World Alumina LLC. Alcoa Inc. and Alcoa Securities Corporation in turn jointly own this company. Therefore, the vessels, the Marlin and the Tarpon, are U.S. owned and EUSC qualifiers.

2) ChevronTexaco Shipping Co. - Marad included six vessels owned by this company in 2002. Our investigation revealed that two of these vessels, the Agawam and the Raymond E. Galvin, had been sold to B&H, which is not a U.S. company. Our contacts at ChevronTexaco have recently reconfirmed that both of these vessels are not EUSC eligible due to sales to foreign owners. ChevronTexaco informed us that the Chevron Zenith is an EUSC vessel, but it has been converted into an oil storage vessel for use off the coast of West Africa. Another vessel, the Kenneth E. Hill, has EUSC status, but it was built in 1979 and will be sold for scrap prior to the OPA 90 deadline. However, we have included it as a confirmed EUSC vessel for 2002. The Charles B. Renfrew and R. Hal Dean are EUSC.

3) Conoco Shipping Co. - The 100% U.S. ownership of these vessels has been confirmed through conversations with the management of Conoco, Inc.

4) El Paso Marine Co. - This company is new to the Marad database for 2002. Its one vessel, the Aruba has been confirmed by company employees as possessing EUSC status.

5) Esso Sapa - All three vessels owned and operated by Esso Sapa, or Esso Socieded Anonima Petrolera Argintin, have been confirmed as having EUSC status. However, the owner has changed the name of the company to Esso Petrolera Argentina SRL, where SRL stands for Sociedad de Responsibilidad Limitada.

6) International Marine Transportation - This operator is new to the Marad database. Its sole vessel, the Royal Arrow, was previously owned by International Marine Transportation, which is associated with Mobil Corporation. It has been sold to foreign interests, and it is not an EUSC qualifier.

Notes from Investigation of Operating Companies Listed in MARAD's January 2002 Database of Militarily Useful, EUSC Tankers

7) OMI Corporation - In past years, OMI Corporation was a U.S. based company with many EUSC qualifying vessels. In 1998, it incorporated in the Marshall Islands. The management of this company does not consider any of its vessels to be EUSC qualifiers. No vessels operated or owned by OMI Corporation on this database are considered EUSC qualifiers.

8) OMI Marine Services LLC - These vessels are owned by OMI Corporation. Therefore, they are not EUSC qualifiers.

9) OSG Ship Management, Inc. - The management of OSG has confirmed that all of the vessels listed by Marad in its 2002 database are majority owned by U.S. companies. Therefore, all of these vessels are EUSC qualifiers. In reviewing the Marad list, OSG also provided information on an additional vessel, the Compass 1, that qualifies as a militarily useful EUSC vessel. It has been included in our database.

10) PCS Phosphate - This operating company is new to the Marad database for 2002. It is a U.S.-based subsidiary of a Canadian company. ABS Record lists this vessel as owned by PCS (Barbados) Phosphate Ltd. Our conversations with the administration of PCS Phosphate led us to the conclusion that their vessel, the Aurora, is not directly or indirectly owned by a U.S. corporation. It is not an EUSC qualifier.

11) Pertamina - This operating company is new to the Marad database for 2002. The two vessels it operates are listed as owned by OMI Corporation. Clarkson Register for 2001 lists these vessels as owned by Osprey of Singapore. In either case, these vessels are non-EUSC.

12) Ravenscroft Shipping Inc. - This operating company is new to the Marad database for 2002. Conversations with the management of this company informed us that Ravenscroft does not own any vessels. The five vessels in question are owned by a Panamanian corporation. None of these vessels are EUSC qualifiers.

13) Seaarland Shipping Management - This operating company is new to the Marad database for 2002. The Marad database indicates that it is owned by OMI Corporation. ABS Record confirms that it is owned by Madison Shipping LLC, a subsidiary of OMI. Therefore, the vessel is not a EUSC qualifier.

14) Y Ships USA, Inc. (Florida) - This operating company is new to the Marad database for 2002. The sole vessel it operates is cited as owned by PLM International. Our conversations confirm this vessel's U.S. ownership. The vessel is scheduled for phase out shortly because it is non-double hull and over 25 years of age.

Results:

The original Marad database for 2002 describes a tanker fleet with 63 vessels for a total of 2,996,856 DWT. The finalized M.I.T. database for June 2002 identifies a fleet comprised of six operators with 29 vessels and a combined deadweight of 2,114,886 DWT.

Appendix E: M.I.T. Militarily Useful, EUSC Tanker Fleet Database

MIT Militarily Useful EUSC Tankers - Listing by Operator

EUSC: MILITARILY USEFUL TANKERS
IN JUNE 2002
BY VESSEL TYPE AND NAME

Alcoa Steamship Co., Inc. (new)

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL_OWNER	NOTES
MARLIN	1977	78	LI	15000	13	ALCOA STEAMSHIP CO INC	Uncoated, Group II; DB
TARPON	1977	78	LI	15000	13.5	ALCOA STEAMSHIP CO INC	Uncoated, Group II; DB

ChevronTexaco Shipping Co.

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL_OWNER	NOTES
CHARLES B RENFREW	1988	02	BF	78656	14	CHEVRON TRANSPORTATION CORP	Uncoated, Group II; SH; Panamax
R HAL DEAN	1988	02	BF	78656	14.8	CHEVRON TRANSPORTATION CORP	Uncoated, Group II; SH; Panamax
KENNETH E HILL	1979	21	BF	81273	15.1	CHEVRON CORP	Uncoated, Group II; SH; Aframax
CHEVRON ZENITH	1972	21	RM	96716	15.5	CHEVRON INTERNATIONAL LTD	Uncoated, Group II; SH; Aframax

subtotal DWT = 335301

Conoco Shipping Co.

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL_OWNER	NOTES
CONTINENTAL	1993	12	LI	98231	14.9	CONOCO SHIPPING CO	Coated, Group I; DH; Aframax
GUARDIAN	1992	21	LI	96920	14.8	CONOCO SHIPPING CO	Coated, Group I; DH; Aframax
PATRIOT	1992	21	LI	96920	14.9	CONOCO SHIPPING CO	Coated, Group I; DH; Aframax
PIONEER	1993	21	LI	96724	14.9	CONOCO SHIPPING CO	Coated, Group I; DH; Aframax

subtotal DWT = 388795

ESSO Petrolera Argentina SRL (former Esso SAPA)

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL OWNER	NOTES
PALM BEACH	1978	02	BF	50801	16.3	ESSO PETROLERA ARGENTINA SRL	EUSC Qualifier
RIO GRANDE	1982	02	LI	15450	12.5	ESSO PETROLERA ARGENTINA SRL	EUSC Qualifier
BAYWAY	1978	12	LI	50915	16.2	ESSO PETROLERA ARGENTINA SRL	EUSC Qualifier

subtotal DWT = 117166

MIT Militarily Useful EUSC Tankers - Listing by Operator

El Paso Marine Co. (new)

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL_OWNER	NOTES
ARUBA	1980	02	LI	69118	15	EL PASO CORP	Uncoated, Group II; DS; Panamax

OSG Ship Management, Inc.

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL_OWNER	NOTES
DELPHINA	1989	02	RM	39047	14	OVERSEAS SHIPHOLDING GROUP	Coated, Group I; DS; Handysize
DIANE	1987	02	RM	63127	14	OVERSEAS SHIPHOLDING GROUP	Coated, Group I; DS; Panamax
LUCY	1986	02	RM	65137	14	OVERSEAS SHIPHOLDING GROUP	Coated, Group I; DS; Panamax
MARY ANN	1986	02	RM	63224	14	OVERSEAS SHIPHOLDING GROUP	Coated, Group I; DS; Panamax
NEPTUNE	1989	02	RM	39452	14	OVERSEAS SHIPHOLDING GROUP	Coated, Group I; DS; Handysize
SUZANNE	1986	02	RM	65157	14	OVERSEAS SHIPHOLDING GROUP	Coated, Group I; DS; Panamax
URANUS	1988	02	RM	39452	14	OVERSEAS SHIPHOLDING GROUP	Coated, Group I; DS; Handysize
VEGA	1989	02	RM	39084	14	OVERSEAS SHIPHOLDING GROUP	Coated, Group I; DS; Handysize
ANIA	1994	12	RM	93349	14.5	OVERSEAS SHIPHOLDING GROUP	Partially Coated, Group II; DH; Aframax
BERYL	1994	12	RM	93301	14	OVERSEAS SHIPHOLDING GROUP	Partially Coated, Group II; DH; Aframax
ELIANE	1994	12	RM	93315	14.5	OVERSEAS SHIPHOLDING GROUP	Partially Coated, Group II; DH; Aframax
PACIFIC RUBY	1994	21	RM	94836	15.5	OVERSEAS SHIPHOLDING GROUP	Coated, Group I; DH; Aframax
PACIFIC SAPPHIRE	1994	21	RM	94653	15.5	OVERSEAS SHIPHOLDING GROUP	Coated, Group I; DH; Aframax
REBECCA	1994	21	RM	93374	14.5	OVERSEAS SHIPHOLDING GROUP	Partially Coated, Group II; DH; Aframax
VENUS V	1981	21	RM	95994	14.7	OVERSEAS SHIPHOLDING GROUP	Partially Coated, Group II; SH/SBT; Pan
VESTA	1980	21	PM	96002	14.7	OVERSEAS SHIPHOLDING GROUP	Partially Coated, Group II; SH/SBT; Afra
COMPASS 1	1992	21	PM	95544	14	OVERSEAS SHIPHOLDING GROUP	Partially Coated, Group II; DS; Aframax

subtotal DWT = 1264048

V Ships USA, Inc. (Florida) (new)

SHIP NAME	BUILT	VT	FLG	DWT	SPD	VESSEL_OWNER	NOTES
CLEMENT	1976	02	BF	59650	16	PLM INTERNATIONAL	Coated, Group I; SH; Panamax

Codes:

02	14	->	Product Tankers < 80,000 dwt
12	5	->	Product Tankers > 80,000 dwt
21	11	->	Crude tankers
33	0	->	Chemical carriers
78	2	->	OBO

MIT Militarily Useful EUSC Tankers - Listing by Operator

Total Vessels in Fleet = 32

Total DWT of fleet = 2,264,078

Appendix F: Summary of Militarily Useful, EUSC Tanker Fleet Projections: 2002, 2006, 2011, and 2016

Summary of Militarily Useful, EUSC Tanker Fleet Projections: 2002, 2006, 2011 and 2016

OPA 90 Phase Out Schedule

	# of Vessels			
	2002	2006	2011	2016
Total M.I.T. Fleet	32	25	19	10
GRP I Only	15	14	14	6
GRP II Only	17	11	5	4

	DWT			
	2002	2006	2011	2016
Total M.I.T. Fleet	2,264,078	1,732,727	1,460,847	951,623
GRP I Only	1,051,614	991,964	991,964	578,284
GRP II Only	1,212,464	740,763	468,883	373,339

	Capacity - Mbbls/month			
	2002	2006	2011	2016
Total M.I.T. Fleet	24,695	19,512	16,660	10,953
GRP I Only	12,190	11,499	11,499	6,742
GRP II Only	12,505	8,013	5,161	4,211

	Capacity - Ton-miles/month			
	2002	2006	2011	2016
Total M.I.T. Fleet	10,434,602	8,244,632	7,039,642	4,628,096
GRP I Only	5,150,874	4,858,821	4,858,821	2,848,862
GRP II Only	5,283,728	3,385,811	2,180,821	1,779,234

MARPOL 13G (Revised) Phase Out Schedule

	# of Vessels			
	2002	2006	2011	2016
Total M.I.T. Fleet	32	25	21	10
GRP I Only	15	14	14	6
GRP II Only	17	11	7	4

	Total DWT			
	2002	2006	2011	2016
Total M.I.T. Fleet	2,264,078	1,894,723	1,618,159	951,623
GRP I Only	1,051,614	991,964	991,964	578,284
GRP II Only	1,212,464	902,759	626,195	373,339

	Capacity - Mbbls/month			
	2002	2006	2011	2016
Total M.I.T. Fleet	24,695	21,331	18,519	10,953
GRP I Only	12,190	11,499	11,499	6,742
GRP II Only	12,505	9,832	7,019	4,211

	Capacity - Ton-miles/month			
	2002	2006	2011	2016
Total M.I.T. Fleet	10,434,602	9,013,076	7,824,761	4,628,096
GRP I Only	5,150,874	4,858,821	4,858,821	2,848,862
GRP II Only	5,283,728	4,154,255	2,965,940	1,779,234

Notes: 1) 3,000 nautical mile distance to theater assumed
2) Group I refers to tanker with fully coated cargo tanks
3) Group II refers to tankers with uncoated or partially coated cargo tanks
4) 1 Mbbl equals 1000 barrels

EUSC Militarily Useful Fleet for January 1, 2006
under OPA 90 Phase Out Regulations

Breakdown by Operator

Alcoa Steamship Co. Inc.

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
MARLIN	ALCOA STEAMSHIP CO INC	78	15,000	13	57,000	1977	No	**Yes**	Yes
TARPON	ALCOA STEAMSHIP CO INC	78	15,000	13.5	57,000	1977	No	**Yes**	Yes
			30,000		114,000		0		

OSG Ship Management

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
DELPHINA	DELPHINA TANKER CORP	02	39,047	14	295,997	1989	No	**Yes**	Yes
DIANE	DIANE TANKER CORP	02	63,127	14	464,424	1987	No	**Yes**	Yes
LUCY	FIRST PRODUCT TANKERS INC	02	65,137	14	456,595	1986	No	**Yes**	Yes
MARY ANN	MARINA TANKER CORP	02	63,224	14	464,424	1986	No	**Yes**	Yes
NEPTUNE	FOURTH PRODUCT TANKERS INC	02	39,452	14	297,593	1989	No	**Yes**	Yes
SUZANNE	SECOND PRODUCTS TANKERS INC	02	65,157	14	456,595	1986	No	**Yes**	Yes
URANUS	THIRD PRODUCTS TANKERS INC	02	39,452	14	297,591	1988	No	**Yes**	Yes
VEGA	VEGA TANKER CORP	02	39,084	14	296,011	1989	No	**Yes**	Yes
ANIA	SARGASSO TANKER CORP (OSG Ship	12	93,349	14.5	650,000	1994	**Yes**	N/A	No
BERYL	FOURTH AFRAMAX TANKER CORP	12	93,301	14	666,321	1994	**Yes**	N/A	No
ELIANE	CARIBBEAN TANKER CORP	12	93,315	14.5	666,321	1994	**Yes**	N/A	No
PACIFIC RUBY	RUBY TANKER CORP	21	94,836	15.5	676,014	1994	**Yes**	N/A	Yes
PACIFIC SAPPHIRE	SAPPHIRE TANKER CORP	21	94,653	15.5	676,014	1994	**Yes**	N/A	Yes
REBECCA	THIRD AFRAMAX TANKER CORP	21	93,374	14.5	666,321	1994	**Yes**	N/A	No
COMPASS I	OVERSEAS SHIPHOLDING GROUP	21	95,544	14	607,372	1992	No	**Yes**	No
			1,072,052		7637593		6		

ExxonMobil Corp.

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
RIO GRANDE	ESSO SAPA*	02	15450	12.5	10314	1982	No	No	No
			15,450		10314		0		

EUSC Militarily Useful Fleet for January 1, 2006
under OPA 90 Phase Out Regulations

El Paso Marine Co.

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
ARUBA	EL PASO CORPORATION	02	69,118	15	483,826	1980	No	**Yes**	No
			69,118		483,826		0		

Conoco Inc. (TX)

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
CONTINENTAL	CONOCO INC (TX)	12	98,231	14.9	710,700	1993	**Yes**	N/A	Yes
GUARDIAN	MERIDIAN TRUST	21	96,920	14.8	668,000	1992	**Yes**	N/A	Yes
PATRIOT	MERIDIAN TRUST	21	96,920	14.9	654,000	1992	**Yes**	N/A	Yes
PIONEER	CONOCO INC (TX)	21	96,724	14.9	648,000	1993	**Yes**	N/A	Yes
			388,795		2680700		4		

ChevronTexaco Shipping Co.

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
CHARLES B RENFREW	CHEVRON TRANSPORT CORP	02	78,656	14	541,000	1988	No	No	No
R HAL DEAN	CHEVRON TRANSPORT CORP	02	78,656	14.8	600,000	1988	No	No	No
			157,312		1141000		0		

DWT = 1,732,727 **Mbbls =** 12,067,433

Notes: 1) Highlighted information is an estimate
2) Barrels estimated as 7.1 barrels per LT of dwt
3) GRT estimated as 1/2 dwt

EUSC Militarily Useful Tanker Fleet for January 1, 2011
under OPA 90 Phase Out Regulations

Breakdown by Operator

OSG Ship Management

Vessel Characteristics										
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	GT	Coated Tanks
DELPHINA	DELPHINA TANKER CORP	02	39,047	14	295,997	1989	No	**Yes**	22972	Yes
DIANE	DIANE TANKER CORP	02	63,127	14	464,424	1987	No	**Yes**	38241	Yes
LUCY	FIRST PRODUCT TANKERS INC	02	65,137	14	456,595	1986	No	**Yes**	36512	Yes
MARY ANN	MARINA TANKER CORP	02	63,224	14	464,424	1986	No	**Yes**	38241	Yes
NEPTUNE	FOURTH PRODUCT TANKERS INC	02	39,452	14	297,593	1989	No	**Yes**	22946	Yes
SUZANNE	SECOND PRODUCTS TANKERS INC	02	65,157	14	456,595	1986	No	**Yes**	36512	Yes
URANUS	THIRD PRODUCTS TANKERS INC	02	39,452	14	297,591	1988	No	**Yes**	22946	Yes
VEGA	VEGA TANKER CORP	02	39,084	14	296,011	1989	No	**Yes**	22972	Yes
ANIA	SARGASSO TANKER CORP (OSG Shi	12	93,349	14.5	650,000	1994	**Yes**	N/A	53341	No
BERYL	FOURTH AFRAMAX TANKER CORP	12	93,301	14	666,321	1994	**Yes**	N/A	53341	No
ELIANE	CARIBBEAN TANKER CORP	12	93,315	14.5	666,321	1994	**Yes**	N/A	53341	No
PACIFIC RUBY	RUBY TANKER CORP	21	94,836	15.5	676,014	1994	**Yes**	N/A	53830	Yes
PACIFIC SAPPHIRE	SAPPHIRE TANKER CORP	21	94,653	15.5	676,014	1994	**Yes**	N/A	53830	Yes
REBECCA	THIRD AFRAMAX TANKER CORP	21	93,374	14.5	666,321	1994	**Yes**	N/A	53341	No
COMPASS I	OVERSEAS SHIPHOLDING GROUP	21	95,544	14	607,372	1992	No	**Yes**	52552	No
			1,072,052		7637593		6			

Conoco Inc. (TX)

Vessel Characteristics										
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	GT	Coated Tanks
CONTINENTAL	CONOCO INC (TX)	12	98,231	14.9	710,700	1993	**Yes**	N/A	53648	Yes
GUARDIAN	MERIDIAN TRUST	21	96,920	14.8	668,000	1992	**Yes**	N/A	53772	Yes
PATRIOT	MERIDIAN TRUST	21	96,920	14.9	654,000	1992	**Yes**	N/A	53772	Yes
PIONEER	CONOCO INC (TX)	21	96,724	14.9	648,000	1993	**Yes**	N/A	53848	Yes
			388,795		2680700		4			

DWT = 1,460,847 **Mbbls =** 10318293

EUSC Militarily Useful Tanker Fleet for January 1, 2011
under OPA 90 Phase Out Regulations

Notes: 1) Highlighted information is an estimate
2) Barrels estimated as 7.1 barrels per LT of dwt
3) GRT estimated as 1/2 dwt

EUSC Militarily Useful Tanker Fleet for January 1, 2016
under OPA 90 Phase Out Regulations

Breakdown by Operator

OSG Ship Management

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
ANIA	SARGASSO TANKER CORP (OSG Shipp	12	93,349	14.5	650,000	1994	**Yes**	N/A	No
BERYL	FOURTH AFRAMAX TANKER CORP	12	93,301	14	666,321	1994	**Yes**	N/A	No
ELIANE	CARIBBEAN TANKER CORP	12	93,315	14.5	666,321	1994	**Yes**	N/A	No
PACIFIC RUBY	RUBY TANKER CORP	21	94,836	15.5	676,014	1994	**Yes**	N/A	Yes
PACIFIC SAPPHIRE	SAPPHIRE TANKER CORP	21	94,653	15.5	676,014	1994	**Yes**	N/A	Yes
REBECCA	THIRD AFRAMAX TANKER CORP	21	93,374	14.5	666,321	1994	**Yes**	N/A	No
			562,828		4000991		6		

Conoco Inc. (TX)

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
CONTINENTAL	CONOCO INC (TX)	12	98,231	14.9	710,700	1993	**Yes**	N/A	Yes
GUARDIAN	MERIDIAN TRUST	21	96,920	14.8	668,000	1992	**Yes**	N/A	Yes
PATRIOT	MERIDIAN TRUST	21	96,920	14.9	654,000	1992	**Yes**	N/A	Yes
PIONEER	CONOCO INC (TX)	21	96,724	14.9	648,000	1993	**Yes**	N/A	Yes
			388,795		2680700		4		

DWT = 951,623 **Mbbls =** 6681691 **Asum =**

Notes: 1) Highlighted information is an estimate
2) Barrels estimated as 7.1 barrels per LT of dwt
3) GRT estimated as 1/2 dwt

EUSC Militarily Useful Tanker Fleet for January 1, 2006
under MARPOL 13/G (Revised) Regulations

Breakdown by Operator

OSG Ship Management

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
DELPHINA	DELPHINA TANKER CORP	02	39,047	14	295,997	1989	No	**Yes**	Yes
DIANE	DIANE TANKER CORP	02	63,127	14	464,424	1987	No	**Yes**	Yes
LUCY	FIRST PRODUCT TANKERS INC	02	65,137	14	456,595	1986	No	**Yes**	Yes
MARY ANN	MARINA TANKER CORP	02	63,224	14	464,424	1986	No	**Yes**	Yes
NEPTUNE	FOURTH PRODUCT TANKERS INC	02	39,452	14	297,593	1989	No	**Yes**	Yes
SUZANNE	SECOND PRODUCTS TANKERS INC	02	65,157	14	456,595	1986	No	**Yes**	Yes
URANUS	THIRD PRODUCTS TANKERS INC	02	39,452	14	297,591	1988	No	**Yes**	Yes
VEGA	VEGA TANKER CORP	02	39,084	14	296,011	1989	No	**Yes**	Yes
ANIA	SARGASSO TANKER CORP (OSG Ship	12	93,349	14.5	650,000	1994	**Yes**	N/A	No
BERYL	FOURTH AFRAMAX TANKER CORP	12	93,301	14	666,321	1994	**Yes**	N/A	No
ELIANE	CARIBBEAN TANKER CORP	12	93,315	14.5	666,321	1994	**Yes**	N/A	No
PACIFIC RUBY	RUBY TANKER CORP	21	94,836	15.5	676,014	1994	**Yes**	N/A	Yes
PACIFIC SAPPHIRE	SAPPHIRE TANKER CORP	21	94,653	15.5	676,014	1994	**Yes**	N/A	Yes
REBECCA	THIRD AFRAMAX TANKER CORP	21	93,374	14.5	666,321	1994	**Yes**	N/A	No
VENUS V	VENUS TANKERS CORP	21	95,994	14.7	607,372	1981	No	No	No
COMPASS I	OVERSEAS SHIPHOLDING GROUP	21	95,544	14	607,372	1992	No	**Yes**	No
VESTA	OLERON TANKER SA	21	96,002	14.7	607,372	1980	No	No	No
			1,264,048		8852337		6		

ExxonMobil Corp.

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
RIO GRANDE	ESSO SAPA*	02	15450	12.5	10314	1982	No	No	No
			15,450		10314		0		

EUSC Militarily Useful Tanker Fleet for January 1, 2006
under MARPOL 13/G (Revised) Regulations

El Paso Marine Co.

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
ARUBA	EL PASO CORPORATION	02	69,118	15	483,826	1980	No	**Yes**	No
			69,118		483,826		0		

Conoco Inc. (TX)

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
CONTINENTAL	CONOCO INC (TX)	12	98,231	14.9	710,700	1993	**Yes**	N/A	Yes
GUARDIAN	MERIDIAN TRUST	21	96,920	14.8	668,000	1992	**Yes**	N/A	Yes
PATRIOT	MERIDIAN TRUST	21	96,920	14.9	654,000	1992	**Yes**	N/A	Yes
PIONEER	CONOCO INC (TX)	21	96,724	14.9	648,000	1993	**Yes**	N/A	Yes
			388,795		2680700		4		

ChevronTexaco Shipping Co.

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
CHARLES B RENFREW	CHEVRON TRANSPORT CORP	02	78,656	14	541,000	1988	No	No	No
R HAL DEAN	CHEVRON TRANSPORT CORP	02	78,656	14.8	600,000	1988	No	No	No
			157,312		1141000		0		

DWT = 1,894,723 **Mbbls =** 13,168,177

Notes: 1) Highlighted information is an estimate
2) Barrels estimated as 7.1 barrels per LT of dwt
3) GRT estimated as 1/2 dwt

EUSC Militarily Useful Tanker Fleet for January 1, 2011
under MARPOL 13/G (Revised) Phase Out Regulations

Breakdown by Operator

OSG Ship Management

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
DELPHINA	DELPHINA TANKER CORP	02	39,047	14	295,997	1989	No	**Yes**	Yes
DIANE	DIANE TANKER CORP	02	63,127	14	464,424	1987	No	**Yes**	Yes
LUCY	FIRST PRODUCT TANKERS INC	02	65,137	14	456,595	1986	No	**Yes**	Yes
MARY ANN	MARINA TANKER CORP	02	63,224	14	464,424	1986	No	**Yes**	Yes
NEPTUNE	FOURTH PRODUCT TANKERS INC	02	39,452	14	297,593	1989	No	**Yes**	Yes
SUZANNE	SECOND PRODUCTS TANKERS INC	02	65,157	14	456,595	1986	No	**Yes**	Yes
URANUS	THIRD PRODUCTS TANKERS INC	02	39,452	14	297,591	1988	No	**Yes**	Yes
VEGA	VEGA TANKER CORP	02	39,084	14	296,011	1989	No	**Yes**	Yes
ANIA	SARGASSO TANKER CORP (OSG Ship	12	93,349	14.5	650,000	1994	**Yes**	N/A	No
BERYL	FOURTH AFRAMAX TANKER CORP	12	93,301	14	666,321	1994	**Yes**	N/A	No
ELIANE	CARIBBEAN TANKER CORP	12	93,315	14.5	666,321	1994	**Yes**	N/A	No
PACIFIC RUBY	RUBY TANKER CORP	21	94,836	15.5	676,014	1994	**Yes**	N/A	Yes
PACIFIC SAPPHIRE	SAPPHIRE TANKER CORP	21	94,653	15.5	676,014	1994	**Yes**	N/A	Yes
REBECCA	THIRD AFRAMAX TANKER CORP	21	93,374	14.5	666,321	1994	**Yes**	N/A	No
COMPASS I	OVERSEAS SHIPHOLDING GROUP	21	95,544	14	607,372	1992	No	**Yes**	No
			1,072,052		7637593		6		

Conoco Inc. (TX)

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
CONTINENTAL	CONOCO INC (TX)	12	98,231	14.9	710,700	1993	**Yes**	N/A	Yes
GUARDIAN	MERIDIAN TRUST	21	96,920	14.8	668,000	1992	**Yes**	N/A	Yes
PATRIOT	MERIDIAN TRUST	21	96,920	14.9	654,000	1992	**Yes**	N/A	Yes
PIONEER	CONOCO INC (TX)	21	96,724	14.9	648,000	1993	**Yes**	N/A	Yes
			388,795		2680700		4		

EUSC Militarily Useful Tanker Fleet for January 1, 2011
under MARPOL 13/G (Revised) Phase Out Regulations

ChevronTexaco Shipping Co.

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
CHARLES B RENFREW	CHEVRON TRANSPORT CORP	02	78,656	14	541,000	1988	No	No	No
R HAL DEAN	CHEVRON TRANSPORT CORP	02	78,656	14.8	600,000	1988	No	No	No
			157,312		1141000		0		

DWT = 1,618,159 **Mbbls =** 11459293

Notes: 1) Highlighted information is an estimate
2) Barrels estimated as 7.1 barrels per LT of dwt
3) GRT estimated as 1/2 dwt

EUSC Militarily Useful Tanker Fleet for January 1, 2016
under MARPOL 13/G (Revised) Regulations

Breakdown by Operator

OSG Ship Management

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
ANIA	SARGASSO TANKER CORP (OSG Ship	12	93,349	14.5	650,000	1994	**Yes**	N/A	No
BERYL	FOURTH AFRAMAX TANKER CORP	12	93,301	14	666,321	1994	**Yes**	N/A	No
ELIANE	CARIBBEAN TANKER CORP	12	93,315	14.5	666,321	1994	**Yes**	N/A	No
PACIFIC RUBY	RUBY TANKER CORP	21	94,836	15.5	676,014	1994	**Yes**	N/A	Yes
PACIFIC SAPPHIRE	SAPPHIRE TANKER CORP	21	94,653	15.5	676,014	1994	**Yes**	N/A	Yes
REBECCA	THIRD AFRAMAX TANKER CORP	21	93,374	14.5	666,321	1994	**Yes**	N/A	No
			562,828		4000991		6		

Conoco Inc. (TX)

Vessel Characteristics									
SHIP_NAME	VESSEL_OWNER	VC	DWT	SPD	BARRELS	BUILT	DH	DB/DS	Coated Tanks
CONTINENTAL	CONOCO INC (TX)	12	98,231	14.9	710,700	1993	**Yes**	N/A	Yes
GUARDIAN	MERIDIAN TRUST	21	96,920	14.8	668,000	1992	**Yes**	N/A	Yes
PATRIOT	MERIDIAN TRUST	21	96,920	14.9	654,000	1992	**Yes**	N/A	Yes
PIONEER	CONOCO INC (TX)	21	96,724	14.9	648,000	1993	**Yes**	N/A	Yes
			388,795		2680700		4		

DWT = 951,623 **Mbbls =** 6681691

Notes: 1) Highlighted information is an estimate
2) Barrels estimated as 7.1 barrels per LT of dwt
3) GRT estimated as 1/2 dwt

Appendix G: Militarily Useful, EUSC Tanker Fleet – Varying the Distance to Theater

EUSC Militarily Useful Fleet - Varying the Distance to Theater

Note: OPA 90 Phase Out Schedule Used

Scenario I: Baseline Case 3,000 nautical miles to theater

	Capacity - Mbbls/month			
	2002	2006	2011	2016
Total M.I.T. Fleet	24,695	19,512	16,660	10,953
GRP I Only	12,190	11,499	11,499	6,742
GRP II Only	12,505	8,013	5,161	4,211

	Capacity - Ton-miles/month			
	2002	2006	2011	2016
Total M.I.T. Fleet	10,434,602	8,244,632	7,039,642	4,628,096
GRP I Only	5,150,874	4,858,821	4,858,821	2,848,862
GRP II Only	5,283,728	3,385,811	2,180,821	1,779,234

Scenario II: Baseline Case 1,500 nautical miles to theater

	Capacity - Mbbls/month			
	2002	2006	2011	2016
Total M.I.T. Fleet	46,043	36,416	31,048	20,338
GRP I Only	22,743	21,460	21,460	12,529
GRP II Only	23,300	14,957	9,588	7,809

	Capacity - Ton-miles/month			
	2002	2006	2011	2016
Total M.I.T. Fleet	9,727,489	7,693,606	6,559,438	4,296,824
GRP I Only	4,804,952	4,533,762	4,533,762	2,646,966
GRP II Only	4,922,537	3,159,844	2,025,676	1,649,857

Scenario III: Baseline Case 5,000 nautical miles to theater

	Capacity - Mbbls/month			
	2002	2006	2011	2016
Total M.I.T. Fleet	15,262	12,053	10,298	6,781
GRP I Only	7,531	7,103	7,103	4,173
GRP II Only	7,730	4,950	3,195	2,608

	Capacity - Ton-miles/month			
	2002	2006	2011	2016
Total M.I.T. Fleet	10,747,635	8,488,110	7,252,214	4,775,455
GRP I Only	5,303,772	5,002,446	5,002,446	2,938,598
GRP II Only	5,443,863	3,485,664	2,249,768	1,836,857

Scenario IV: Baseline Case 8,000 nautical miles to theater

	Capacity - Mbbls/month			
	2002	2006	2011	2016
Total M.I.T. Fleet	9,702	7,661	6,548	4,316
GRP I Only	4,787	4,515	4,515	2,655
GRP II Only	4,915	3,146	2,033	1,660

	Capacity - Ton-miles/month			
	2002	2006	2011	2016
Total M.I.T. Fleet	10,932,267	8,631,584	7,377,586	4,862,570
GRP I Only	5,393,883	5,087,078	5,087,078	2,991,628
GRP II Only	5,538,384	3,544,506	2,290,508	1,870,942

Scenario V: Baseline Case 10,000 nautical miles to theater

	Capacity - Mbbls/month			
	2002	2006	2011	2016
Total M.I.T. Fleet	7,807	6,163	5,268	3,474
GRP I Only	3,851	3,632	3,632	2,137
GRP II Only	3,955	2,531	1,636	1,337

	Capacity - Ton-miles/month			
	2002	2006	2011	2016
Total M.I.T. Fleet	10,995,255	8,680,508	7,420,357	4,892,324
GRP I Only	5,424,613	5,115,937	5,115,937	3,009,737
GRP II Only	5,570,642	3,564,571	2,304,420	1,882,587

Appendix H: U.S. Flag, Militarily Useful Tanker Fleet Capacity Projections: 2006, 2011, and 2016

U.S. FLAG, MILITARILY USEFUL TANKER FLEET CAPACITY FOR JANUARY 1, 2006

Double Hulled Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Hull	Type
ANASAZI	SHIP	275,800	DH	CPP
CAPTAIN H.A. DOWING	SHIP	275,800	DH	CPP
CHEMICAL PIONEER	SHIP	214,830	DH	CHM
CHEVRON ARIZONA	SHIP	275,016	DH	CPP
CHEVRON COLORADO	SHIP	274,529	DH	CPP
CHEVRON WASHINGTON	SHIP	274,468	DH	CPP
DILIGENCE	SHIP	274,529	DH	CPP
HMI AMBROSSE CHANNEL	SHIP	341,459	DH	CPP
HMI ASTRACHEM	SHIP	267,894	DH	CPP
HMI BRETTON REEF	SHIP	341,459	DH	CPP
SEABULK ARCTIC (ex-HMI Cape Lookout Shoals)	SHIP	341,459	DH	CPP
SEABULK MARINER (ex-HMI Diamond Shoals)	SHIP	341,459	DH	CPP
SEABULK PRIDE (ex-HMI Nantucket Shoals)	SHIP	341,459	DH	CPP
INTEGRITY	SHIP	274,469	DH	CPP
MISSION CAPISTRANO	SHIP	306,587	DH	CPP
NEW RIVER	SHIP	268,762	DH	CHM
S/R AMERICAN PROGRESS	SHIP	341,459	DH	CPP
S/R GALVESTON	SHIP	198,981	DH	Crude
THE MONSEIGNEUR	SHIP	268,762	DH	CHM

# of vessels = 19

TOTAL CAPACITY IN BARRELS	5,499,181

Single Hulled/Double Sided/Double Bottomed Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Phase Out	Type
HMI DEFENDER	SHIP	260,548	Aug-2008	CPP
OVERSEAS NEW ORLEANS	SHIP	306,690	Jun-2008	CPP
CHILBAR	SHIP	298,379	May-2006	CHM
COASTAL EAGLE POINT	SHIP	362,494	Oct-2006	CPP
MARINE COLUMBIA	SHIP	359,579	Nov-2006	Crude
OVERSEAS WASHINGTON	SHIP	676,046	Mar-2006	Crude
PERSEVERANCE	SHIP	247,778	Dec-2006	CPP
BLUE RIDGE	SHIP	300,978	Jul-2011	CPP
COAST RANGE	SHIP	306,897	Sep-2011	CPP
SEABULK TRADER (ex-HMI Dynachem)	SHIP	368,252	Sep-2011	CPP
KEYSTONE TEXAS	SHIP	306,913	Dec-2011	CPP
SEABULK CHALLENGE (ex-HMI Petrochem)	SHIP	368,252	Dec-2011	CHM
S/R GALENA BAY (ex-Chesapeake Trader)	SHIP	356,102	Jan-2012	Crude
OVERSEAS PHILADELPHIA	SHIP	306,690	May-2012	CPP
POLAR TRADER	SHIP	356,102	Dec-2012	Crude
S/R BAYTOWN	SHIP	459,370	Aug-2012	Crude
S/R PUGET SOUND	SHIP	363,369	May-2013	Crude

U.S. FLAG, MILITARILY USEFUL TANKER FLEET CAPACITY FOR JANUARY 1, 2006

S/R CHARLESTON	SHIP	380,227	Oct-2013	CHM
SEA VENTURE	SHIP	137,830	Jan-2013	Crude
S/R WILMINGTON	SHIP	377,270	Jun-2014	CHM
SEA ISLE CITY	SHIP	613,629	Jan-2015	Crude
SEABULK AMERICA	SHIP	297,573	Jan-2015	CHM
CHESAPEAKE CITY	SHIP	620,356	Jan-2015	Crude

# of vessels = 23

Total capacity = 8,431,324

Total capacity of fleet (barrels) =	**13,930,505**
Total approx. DWT of fleet =	**1,962,043**
Total # of vessels in fleet =	**42**

MU Fleet Breakdown:

	#	# DH
Crude Carriers =	10	1
Product Tankers =	24	15
Chemical Carriers =	8	3
Specialty Tankers =	0	0
Totals =	42	19

U.S. FLAG, MILITARILY USEFUL TANKER FLEET CAPACITY FOR JANUARY 1, 2011

Double Hulled Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Hull	Type
ANASAZI	SHIP	275,800	DH	CPP
CAPTAIN H.A. DOWING	SHIP	275,800	DH	CPP
CHEMICAL PIONEER	SHIP	214,830	DH	CHM
CHEVRON ARIZONA	SHIP	275,016	DH	CPP
CHEVRON COLORADO	SHIP	274,529	DH	CPP
CHEVRON WASHINGTON	SHIP	274,468	DH	CPP
DILIGENCE	SHIP	274,529	DH	CPP
HMI AMBROSSE CHANNEL	SHIP	341,459	DH	CPP
HMI ASTRACHEM	SHIP	267,894	DH	CPP
HMI BRETTON REEF	SHIP	341,459	DH	CPP
SEABULK ARCTIC (ex-HMI Cape Lookout Shoals)	SHIP	341,459	DH	CPP
SEABULK MARINER (ex-HMI Diamond Shoals)	SHIP	341,459	DH	CPP
SEABULK PRIDE (ex-HMI Nantucket Shoals)	SHIP	341,459	DH	CPP
INTEGRITY	SHIP	274,469	DH	CPP
MISSION CAPISTRANO	SHIP	306,587	DH	CPP
NEW RIVER	SHIP	268,762	DH	CHM
S/R AMERICAN PROGRESS	SHIP	341,459	DH	CPP
S/R GALVESTON	SHIP	198,981	DH	Crude
THE MONSEIGNEUR	SHIP	268,762	DH	CHM

# of vessels = 19

TOTAL CAPACITY IN BARRELS	5,499,181

Single Hulled/Double Sided/Double Bottomed Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Phase Out	Type
BLUE RIDGE	SHIP	300,978	Jul-2011	CPP
COAST RANGE	SHIP	306,897	Sep-2011	CPP
SEABULK TRADER (ex-HMI Dynachem)	SHIP	368,252	Sep-2011	CPP
KEYSTONE TEXAS	SHIP	306,913	Dec-2011	CPP
SEABULK CHALLENGE (ex-HMI Petrochem)	SHIP	368,252	Dec-2011	CHM
S/R GALENA BAY (ex-Chesapeake Trader)	SHIP	356,102	Jan-2012	Crude
OVERSEAS PHILADELPHIA	SHIP	306,690	May-2012	CPP
POLAR TRADER	SHIP	356,102	Dec-2012	Crude
S/R BAYTOWN	SHIP	459,370	Aug-2012	Crude
S/R PUGET SOUND	SHIP	363,369	May-2013	Crude
S/R CHARLESTON	SHIP	380,227	Oct-2013	CHM
SEA VENTURE	SHIP	137,830	Jan-2013	Crude
S/R WILMINGTON	SHIP	377,270	Jun-2014	CHM
SEA ISLE CITY	SHIP	613,629	Jan-2015	Crude
SEABULK AMERICA	SHIP	297,573	Jan-2015	CHM
CHESAPEAKE CITY	SHIP	620,356	Jan-2015	Crude

U.S. FLAG, MILITARILY USEFUL TANKER FLEET CAPACITY FOR JANUARY 1, 2011

of vessels = 16
Total capacity = 5,919,810

Total capacity of fleet (barrels) =	**11,418,991**
Total approx. DWT of fleet =	**1,608,309**
Total # of vessels in fleet =	**35**

MU Fleet Breakdown:

	#	# DH
Crude Carriers =	8	1
Product Tankers =	20	15
Chemical Carriers =	7	3
Specialty Tankers =	0	0
Totals =	35	19

U.S. FLAG, MILITARILY USEFUL TANKER FLEET CAPACITY FOR JANUARY 1, 2016

Double Hulled Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Hull	Type
ANASAZI	SHIP	275,800	DH	CPP
CAPTAIN H.A. DOWING	SHIP	275,800	DH	CPP
CHEMICAL PIONEER	SHIP	214,830	DH	CHM
CHEVRON ARIZONA	SHIP	275,016	DH	CPP
CHEVRON COLORADO	SHIP	274,529	DH	CPP
CHEVRON WASHINGTON	SHIP	274,468	DH	CPP
DILIGENCE	SHIP	274,529	DH	CPP
HMI AMBROSSE CHANNEL	SHIP	341,459	DH	CPP
HMI ASTRACHEM	SHIP	267,894	DH	CPP
HMI BRETTON REEF	SHIP	341,459	DH	CPP
SEABULK ARCTIC (ex-HMI Cape Lookout Shoals)	SHIP	341,459	DH	CPP
SEABULK MARINER (ex-HMI Diamond Shoals)	SHIP	341,459	DH	CPP
SEABULK PRIDE (ex-HMI Nantucket Shoals)	SHIP	341,459	DH	CPP
INTEGRITY	SHIP	274,469	DH	CPP
MISSION CAPISTRANO	SHIP	306,587	DH	CPP
NEW RIVER	SHIP	268,762	DH	CHM
S/R AMERICAN PROGRESS	SHIP	341,459	DH	CPP
S/R GALVESTON	SHIP	198,981	DH	Crude
THE MONSEIGNEUR	SHIP	268,762	DH	CHM

# of vessels = 19

TOTAL CAPACITY IN BARRELS	5,499,181

Single Hulled/Double Sided/Double Bottomed Vessels

VESSEL NAME	Vsl Type	Cap. Bbls	Phase Out	Type

# of vessels = 0

Total capacity = 0

Total capacity of fleet (barrels) =	**5,499,181**
Total approx. DWT of fleet =	**774,533**
Total # of vessels in fleet =	**19**

MU Fleet Breakdown:

	#	# DH
Crude Carriers =	1	1
Product Tankers =	15	15
Chemical Carriers =	3	3
Specialty Tankers =	0	0
Totals =	19	19

Appendix I: EUSC, Militarily Useful Tankers – Variation of Tonnage Replacement

EUSC Militarily Useful Tanker - Variation of Tonnage Replacement

Scenario: 2016 Fleet w/ Replaced Tonnage **Year:** **2016**

Sealift Variables: Distance to Theater = 3000 nautical miles

Avg. tonnage of phased out tankers	62,910 dwt
Percentage replaced	**0%**
# of phased out vessels	19
Phased out tonnage	1,195,289 dwt

Combined Fleet Data:

# of ships in fleet	10
DWT of fleet	951,623 dwt
Capacity	4,032,728 barrels
Average DWT per vessel	95,162 dwt/ship

Measure	Capacity per Day	Capacity per Month
Barrels Delivered	365,105	10,953,161
Ton-miles Achieved	154,270	4,628,096

Group I Fleet:

# of ships	6
DWT	578,284

Measure	Capacity per Day	Capacity per Month
Barrels Delivered	224,744	6,742,307
Ton-miles Achieved	94,962	2,848,862

Group II Fleet:

# of ships	4
DWT	373,339

Measure	Capacity per Day	Capacity per Month
Barrels Delivered	140,362	4,210,854
Ton-miles Achieved	59,308	1,779,234

EUSC Militarily Useful Tanker - Variation of Tonnage Replacement

Scenario: 2016 Fleet w/ Replaced Tonnage **Year:** **2016**

Sealift Variables: Distance to Theater = 3000 nautical miles

Avg. tonnage of phased out tankers	62,910 dwt
Percentage replaced	**25%**
# of phased out vessels	19
Phased out tonnage	1,195,289 dwt

Combined Fleet Data:

# of ships in fleet	14.75
DWT of fleet	1,250,445 dwt
Capacity	6,154,366 barrels
Average DWT per vessel	84,776 dwt/ship

	Capacity	
Measure	per Day	per Month
Barrels Delivered	462,466	13,873,970
Ton-miles Achieved	195,408	5,862,241

Group I Fleet:

# of ships	10.75
DWT	877,106

	Capacity	
Measure	per Day	per Month
Barrels Delivered	322,104	9,663,117
Ton-miles Achieved	136,100	4,083,007

Group II Fleet:

# of ships	4
DWT	373,339

	Capacity	
Measure	per Day	per Month
Barrels Delivered	140,362	4,210,854
Ton-miles Achieved	59,308	1,779,234

EUSC Militarily Useful Tanker - Variation of Tonnage Replacement

Scenario: 2016 Fleet w/ Replaced Tonnage **Year: 2016**

Sealift Variables: Distance to Theater = 3000 nautical miles

Avg. tonnage of phased out tankers	62,910 dwt
Percentage replaced	**50%**
# of phased out vessels	19
Phased out tonnage	1,195,289 dwt

Combined Fleet Data:

# of ships in fleet	19.5
DWT of fleet	1,549,268 dwt
Capacity	8,276,004 barrels
Average DWT per vessel	79,450 dwt/ship

	Capacity	
Measure	per Day	per Month
Barrels Delivered	528,255	15,847,648
Ton-miles Achieved	223,206	6,696,189

Group I Fleet:

# of ships	15.5
DWT	1,175,929

	Capacity	
Measure	per Day	per Month
Barrels Delivered	387,893	11,636,794
Ton-miles Achieved	163,899	4,916,955

Group II Fleet:

# of ships	4
DWT	373,339

	Capacity	
Measure	per Day	per Month
Barrels Delivered	140,362	4,210,854
Ton-miles Achieved	59,308	1,779,234

Appendix J: Summary of EUSC Tanker Fleet over 100,000 DWT for June 2002 & January 2006

EUSC Tankers over 100,000 DWT as of June 2002

Parent Company	Vessel Name	Direct Owner	Flag	Year	DWT	GRT	Notes
ChevronTexaco Shipping Corp.	CHEVRON EMPLOYEE	CM Pacific Maritime Corp.	BH	1994	156,447	88,919	CLV; DH; Group II
ChevronTexaco Shipping Corp.	CHEVRON MARINER	Chevron Transport Corp.	LI	1994	156,382	88,919	CLV; DH; Group II
ChevronTexaco Shipping Corp.	CONDOLEEZZA RICE	Chevron Transport Corp.	BH	1993	135,829	80,914	CLV; DH; Group II
ChevronTexaco Shipping Corp.	GEORGE SHULTZ	Chevron Transport Corp.	LI	1993	136,055	80,914	Owned; DH; Group II
ChevronTexaco Shipping Corp.	CHEVRON PERTH	Chevron Transport Corp.	BH	1975	276,838		Owned; SH; Group II
ChevronTexaco Shipping Corp.	JAMES N. SULLIVAN	Chevron Transport Corp.	LI	1992	135,915	80,914	Owned; DH; Group II
ChevronTexaco Shipping Corp.	SAMUEL GINN	Chevron Transport Corp.	BH	1993	156,835	88,919	CLV; DH; Group II
ChevronTexaco Shipping Corp.	WILLIAM E. CRAIN	Chevron Transport Corp.	LI	1992	155,127	88,946	CLV; SH; Group II
Conoco Inc.	SENTINEL	Conoco Shipping Co.	MI	1999	104,700		DH; Group I
Conoco Inc.	CONSTITUTION	Conoco Shipping Co.	MI	1999	104,623		DH; Group I
ExxonMobil Corporation	EAGLE	Mobil Shipping Co. Ltd.	MI	1993	301,691	160,347	DH; Group II
ExxonMobil Corporation	RAVEN	International Marine Transport	MI	1996	301,658	160,348	DH; Group II
ExxonMobil Corporation	ALREHAB	International Marine Transport	MI	1999	301,620		DH; Group II
ExxonMobil Corporation	KESTREL	International Marine Transport	MI	2000	307,000		DH; Group II
ExxonMobil Corporation	HAWK	International Marine Transport	MI	2000	307,000		DH; Group II
ExxonMobil Corporation	FLINDERS	Mobil Shipping & Transportion	MI	1982	149,000		SH; Group II
ExxonMobil Corporation	ECLIPSE	Mobil Shipping & Transportion	MI	1989	135,000		CLV; SH; Group II
ExxonMobil Corporation	OSPREY	International Marine Transport	MI	1999	301,000		DH; Group II
ExxonMobil Corporation	RAS LAFFAN	International Marine Transport	MI	1999	105,424		DH; Group II
ExxonMobil Corporation	VALIANT	International Marine Transport	MI	1999	105,476		DH; Group II
Overseas Shipholding Group	EQUATORIAL LION	First Union Tanker Corporation	MI	1997	273,539	156,880	DH; Group II
Overseas Shipholding Group	MERIDIAN LION	Second Union Tanker	MI	1997	300,578	156,880	DH; Group II
Overseas Shipholding Group	REGAL UNITY	Regency Tankers Corporation	MI	1997	309,966	164,371	DH; Group II
Overseas Shipholding Group	CROWN UNITY	Imperial Tankers Corp.	PA	1996	300,482	156,807	DH; Group II
Overseas Shipholding Group	MAJESTIC UNITY	Royal Tankers Corp.	PA	1996	300,549	156,852	DH; Group II
Overseas Shipholding Group	OLYMPIA	Olympia Tanker Corp.	MI	1990	258,076	144,139	SH; Group II
Overseas Shipholding Group	SOVEREIGN UNITY	Majestic Tankers Corp.	MI	1996	309,892	164,371	DH; Group II
Overseas Shipholding Group	*OVERSEAS CHRIS*	OSG Subsidiary/Affiliate	EQ	2001	304,401		DH; Group II
Overseas Shipholding Group	*OVERSEAS ANN*	OSG Subsidiary/Affiliate	EQ	2001	304,494		DH; Group II
Overseas Shipholding Group	*OVERSEAS DONNA*	OSG Subsidiary/Affiliate	EQ	2000	304,608		DH; Group II
Overseas Shipholding Group	*RAPHAEL*	OSG Subsidiary/Affiliate	EQ	2000	304,722		DH; Group II
Overseas Shipholding Group	*HULL 1372*	OSG Subsidiary/Affiliate	EQ	2002	313,963		DH; Group II
Overseas Shipholding Group	*OVERSEAS FRAN*	OSG Subsidiary/Affiliate	EQ	2001	110,347		DH; Group II
Overseas Shipholding Group	*OVERSEAS JOSEFA*	OSG Subsidiary/Affiliate	EQ	2001	110,427		DH; Group II

Overseas Shipholding Group	*OVERSEAS SHIRLEY*	OSG Subsidiary/Affiliate	EQ	2001	110,286		DH; Group II
Overseas Shipholding Group	*HULL 1286*	OSG Subsidiary/Affiliate	EQ	2002	110,920		DH; Group II

# of Vessels in Fleet = 36

Total Fleet DWT = 7,860,870

Average DWT = 218,358

Average Year of Contruction = 1997.5

Average Age of Fleet = 4.5

Flags:

BH = Bahamas
LI = Liberia
PA = Panama
MI = Marshall Islands
EQ = EUSC Qualifier

Notes:

1. ChevronTexaco large tankers carry crude oil. Their tanks are not fully coated. Top portions are typically coated.
2. Chevron Perth name is being changed.
3. All ChevronTexaco vessels are undergoing name changes to a new naming convention based upon a star/heavenly body followed by "Voyager", such as *Capella Voyager*, *Orion Voyager*, etc.
4. Capital lease vessels included. Indicated by code of CLV.
5. Group I - fully coated tanks; Group II - partially coated or uncoated cargo tanks
6. Vessels in italics are newer vessels not appearing in January 2001 version of Clarkson Register

EUSC VLCC Database as of June 2002

Parent Company	Vessel Name	Direct Owner	Year	DWT	Capacity	Speed	GRT
ChevronTexaco Shipping Corp.	CHEVRON PERTH	Chevron Transport Corp.	1975	276,838	2,044,000	15.2	
ExxonMobil Corporation	EAGLE	Mobil Shipping Co. Ltd.	1993	301,691	2,093,000	16.15	160,347
ExxonMobil Corporation	RAVEN	International Marine Transport	1996	301,658	2,093,000	15.0	160,348
ExxonMobil Corporation	ALREHAB	International Marine Transport	1999	301,620	2,173,000	15.0	
ExxonMobil Corporation	KESTREL	International Marine Transport	2000	307,000	2,168,000	15.0	
ExxonMobil Corporation	HAWK	International Marine Transport	2000	307,000	2,168,000	15.0	
ExxonMobil Corporation	OSPREY	International Marine Transport	1999	301,000	2,173,000	15.5	
Overseas Shipholding Group	EQUATORIAL LION	First Union Tanker Corporation	1997	273,539	2,085,000	15.2	156,880
Overseas Shipholding Group	MERIDIAN LION	Second Union Tanker	1997	300,578	2,085,000	15.2	156,880
Overseas Shipholding Group	REGAL UNITY	Regency Tankers Corporation	1997	309,966	2,201,000	14.6	164,371
Overseas Shipholding Group	CROWN UNITY	Imperial Tankers Corp.	1996	300,482	2,085,000	15.0	156,807
Overseas Shipholding Group	MAJESTIC UNITY	Royal Tankers Corp.	1996	300,549	2,085,000	15.0	156,852
Overseas Shipholding Group	OLYMPIA	Olympia Tanker Corp.	1990	258,076	1,888,000	14.9	144,139
Overseas Shipholding Group	SOVEREIGN UNITY	Majestic Tankers Corp.	1996	309,892	2,201,000	14.6	164,371
Overseas Shipholding Group	*OVERSEAS CHRIS*	OSG Subsidiary/Affiliate	2001	304,401	2,161,247	15.0	
Overseas Shipholding Group	*OVERSEAS ANN*	OSG Subsidiary/Affiliate	2001	304,494	2,161,907	15.0	
Overseas Shipholding Group	*OVERSEAS DONNA*	OSG Subsidiary/Affiliate	2000	304,608	2,162,717	15.0	
Overseas Shipholding Group	*RAPHAEL*	OSG Subsidiary/Affiliate	2000	304,722	2,163,526	15.0	
Overseas Shipholding Group	*HULL 1372*	OSG Subsidiary/Affiliate	2002	313,963	2,229,137	15.0	

# of Vessels in Fleet = 19

Total Fleet DWT = 5,682,077

Average DWT = 299,057

Total Fleet Capacity = 40,420,535 barrels

Average Capacity = 2,127,397

Average Speed = 15.1

Note: 1) Highlighted information is estimated.
2) Capacity estimated by 7.1 barrels per dwt.
3) Speed estimated from ACOE data on FF tankers.
4) Vessels in italics do not appear in Clarkson Register for January 2001.

EUSC Suezmax Tanker Database as of June 2002

Parent Company	Vessel Name	Direct Owner	Year	DWT	Capacity	Speed	GRT
ChevronTexaco Shipping Corp.	CHEVRON EMPLOYEE	CM Pacific Maritime Corp.	1994	156,447	1,131,000	15.5	88,919
ChevronTexaco Shipping Corp.	CHEVRON MARINER	Chevron Transport Corp.	1994	156,382	1,131,000	15.5	88,919
ChevronTexaco Shipping Corp.	CONDOLEEZZA RICE	Chevron Transport Corp.	1993	135,829	1,002,000	15.5	80,914
ChevronTexaco Shipping Corp.	GEORGE SHULTZ	Chevron Transport Corp.	1993	136,055	1,002,000	15.5	80,914
ChevronTexaco Shipping Corp.	JAMES N. SULLIVAN	Chevron Transport Corp.	1992	135,915	1,002,000	15.5	80,914
ChevronTexaco Shipping Corp.	SAMUEL GINN	Chevron Transport Corp.	1993	156,835	1,131,000	15.0	88,919
ChevronTexaco Shipping Corp.	WILLIAM E. CRAIN	Chevron Transport Corp.	1992	155,127	1,142,000	15.5	88,946
ExxonMobil Corporation	FLINDERS	Mobil Shipping & Transportion	1982	149,000	1,109,000	15.0	88,122
ExxonMobil Corporation	ECLIPSE	Mobil Shipping & Transportion	1989	135,000	1,006,000	14.0	78,244

# of Vessels in Fleet = 9

Total Fleet DWT = 1,316,590

Average DWT = 146,288

Total Fleet Capacity = 9,656,000

Average Capacity = 1,072,889

Average Speed = 15.2

Note: 1) Highlighted information is estimated.
2) Capacity estimated by 7.1 barrels per dwt.
3) Speed estimated from ACOE data on FF tankers.
4) Vessels in italics do not appear in Clarkson Register for January 2001.

EUSC Aframax Tanker Database as of June 2002

Parent Company	Vessel Name	Direct Owner	Year	DWT	Capacity	Speed	GRT
Conoco Inc.	SENTINEL	Conoco Shipping Co.	1999	104,700	743,370	15.0	
Conoco Inc.	CONSTITUTION	Conoco Shipping Co.	1999	104,623	742,823	15.0	
ExxonMobil Corporation	RAS LAFFAN	International Marine Transport	1999	105,424	748,510	14.5	
ExxonMobil Corporation	VALIANT	International Marine Transport	1999	105,476	748,880	14.5	
Overseas Shipholding Group	*OVERSEAS FRAN*	OSG Subsidiary/Affiliate	2001	110,347	783,464	15	
Overseas Shipholding Group	*OVERSEAS JOSEFA*	OSG Subsidiary/Affiliate	2001	110,427	784,032	15	
Overseas Shipholding Group	*OVERSEAS SHIRLEY*	OSG Subsidiary/Affiliate	2001	110,286	783,031	15	
Overseas Shipholding Group	*HULL 1286*	OSG Subsidiary/Affiliate	2002	110,920	787,532	15	

# of Vessels in Fleet = 8

Total Fleet DWT = 862,203

Average DWT = 107,775

Total Fleet Capacity = 6,121,641

Average Capacity = 765,205

Average Speed = 14.9

Note: 1) Highlighted information is estimated.
2) Capacity estimated by 7.1 barrels per dwt.
3) Speed estimated from ACOE data on FF tankers.
4) Vessels in italics do not appear in Clarkson Register for January 2001.

EUSC Tankers over 100,000 DWT as of January 1, 2006

Parent Company	Vessel Name	Direct Owner	Flag	Year	DWT	GRT	Notes
ChevronTexaco Shipping Corp.	CHEVRON EMPLOYEE	CM Pacific Maritime Corp.	BH	1994	156,447	88,919	CLV; DH; Group II
ChevronTexaco Shipping Corp.	CHEVRON MARINER	Chevron Transport Corp.	LI	1994	156,382	88,919	CLV; DH; Group II
ChevronTexaco Shipping Corp.	CONDOLEEZZA RICE	Chevron Transport Corp.	BH	1993	135,829	80,914	CLV; DH; Group II
ChevronTexaco Shipping Corp.	GEORGE SHULTZ	Chevron Transport Corp.	LI	1993	136,055	80,914	Owned; DH; Group II
ChevronTexaco Shipping Corp.	JAMES N. SULLIVAN	Chevron Transport Corp.	LI	1992	135,915	80,914	Owned; DH; Group II
ChevronTexaco Shipping Corp.	SAMUEL GINN	Chevron Transport Corp.	BH	1993	156,835	88,919	CLV; DH; Group II
ChevronTexaco Shipping Corp.	WILLIAM E. CRAIN	Chevron Transport Corp.	LI	1992	155,127	88,946	CLV; SH; Group II
Conoco Inc.	SENTINEL	Conoco Shipping Co.	MI	1999	104,700		DH; Group I
Conoco Inc.	CONSTITUTION	Conoco Shipping Co.	MI	1999	104,623		DH; Group I
ExxonMobil Corporation	EAGLE	Mobil Shipping Co. Ltd.	MI	1993	301,691	160,347	DH; Group II
ExxonMobil Corporation	RAVEN	International Marine Transport	MI	1996	301,658	160,348	DH; Group II
ExxonMobil Corporation	ALREHAB	International Marine Transport	MI	1999	301,620		DH; Group II
ExxonMobil Corporation	KESTREL	International Marine Transport	MI	2000	307,000		DH; Group II
ExxonMobil Corporation	HAWK	International Marine Transport	MI	2000	307,000		DH; Group II
ExxonMobil Corporation	ECLIPSE	Mobil Shipping & Transportion	MI	1989	135,000		CLV; SH; Group II
ExxonMobil Corporation	OSPREY	International Marine Transport	MI	1999	301,000		DH; Group II
ExxonMobil Corporation	RAS LAFFAN	International Marine Transport	MI	1999	105,424		DH; Group II
ExxonMobil Corporation	VALIANT	International Marine Transport	MI	1999	105,476		DH; Group II
Overseas Shipholding Group	EQUATORIAL LION	First Union Tanker Corporation	MI	1997	273,539	156,880	DH; Group II
Overseas Shipholding Group	MERIDIAN LION	Second Union Tanker	MI	1997	300,578	156,880	DH; Group II
Overseas Shipholding Group	REGAL UNITY	Regency Tankers Corporation	MI	1997	309,966	164,371	DH; Group II
Overseas Shipholding Group	CROWN UNITY	Imperial Tankers Corp.	PA	1996	300,482	156,807	DH; Group II
Overseas Shipholding Group	MAJESTIC UNITY	Royal Tankers Corp.	PA	1996	300,549	156,852	DH; Group II
Overseas Shipholding Group	OLYMPIA	Olympia Tanker Corp.	MI	1990	258,076	144,139	SH; Group II
Overseas Shipholding Group	SOVEREIGN UNITY	Majestic Tankers Corp.	MI	1996	309,892	164,371	DH; Group II
Overseas Shipholding Group	*OVERSEAS CHRIS*	OSG Subsidiary/Affiliate	EQ	2001	304,401		DH; Group II
Overseas Shipholding Group	*OVERSEAS ANN*	OSG Subsidiary/Affiliate	EQ	2001	304,494		DH; Group II
Overseas Shipholding Group	*OVERSEAS DONNA*	OSG Subsidiary/Affiliate	EQ	2000	304,608		DH; Group II
Overseas Shipholding Group	*RAPHAEL*	OSG Subsidiary/Affiliate	EQ	2000	304,722		DH; Group II
Overseas Shipholding Group	*HULL 1372*	OSG Subsidiary/Affiliate	EQ	2002	313,963		DH; Group II
Overseas Shipholding Group	*OVERSEAS FRAN*	OSG Subsidiary/Affiliate	EQ	2001	110,347		DH; Group II
Overseas Shipholding Group	*OVERSEAS JOSEFA*	OSG Subsidiary/Affiliate	EQ	2001	110,427		DH; Group II
Overseas Shipholding Group	*OVERSEAS SHIRLEY*	OSG Subsidiary/Affiliate	EQ	2001	110,286		DH; Group II
Overseas Shipholding Group	*HULL 1286*	OSG Subsidiary/Affiliate	EQ	2002	110,920		DH; Group II
Overseas Shipholding Group	*HULL 1395*	OSG Subsidiary/Affiliate	EQ	2003	313,963		DH; Group II

Overseas Shipholding Group	*HULL S163*	OSG Subsidiary/Affiliate	EQ	2003	110,920	DH; Group II
Overseas Shipholding Group	*HULL S164*	OSG Subsidiary/Affiliate	EQ	2004	110,920	DH; Group II

# of Vessels in Fleet = 37

Total Fleet DWT = 7,970,835

Average DWT = 215,428

Average Year of Contruction = 2000.1

Average Age of Fleet = 5.9

Flags:

BH = Bahamas
LI = Liberia
PA = Panama
MI = Marshall Islands
EQ = EUSC Qualifier

Notes:

1. ChevronTexaco large tankers carry crude oil. Their tanks are not fully coated. Top portions are typically coated.
2. Chevron Perth name is being changed.
3. All ChevronTexaco vessels are undergoing name changes to a new naming convention based upon a star/heavenly body followed by "Voyager", such as *Capella Voyager*, *Orion Voyager*, etc.
4. Capital lease vessels included. Indicated by code of CLV.
5. Group I - fully coated tanks; Group II - partially coated or uncoated cargo tanks
6. Vessels in italics are newer vessels not appearing in January 2001 version of Clarkson Register

Appendix K: EUSC Tankers over 100,000 DWT – Substitution for HSTEs with Regard to Distance to Theater

EUSC Fleet of Tankers - Substitution of Tankers over 100,000 dwt for Handysized, Foreign Owned Chartered Tankers

Case Name: Baseline - 3,000 nmi Distance to Theater

Model Variables		
Distance to Theater	3000	nautical miles
Weight of fuel	7.1	LT/barrel
Load rate	7000	LT/hr
Load Time	4	hr, minimum
Transition Time	3	hr, large vessels only

Vessel Characteristics							Trip Results		
SIZE CATEGORY	VESSEL OWNER	DWT	SPD	BARRELS	DWT	Distance	LT of Fuel	Pump Out (MT/hr)	Pump Out (LT/hr)
Average Large EUSC Tanker	EUSC	218,358	15	1,561,060	218,358	3000	219868	13500	13287
Average EUSC VLCC Tanker	EUSC	300,291	15	2,132,030	300,291	3000	300286	15000	14763
Average EUSC Suezmax Tanker	EUSC	147,513	15	1,072,889	147,513	3000	151111	11000	10826
Average EUSC Aframax Tanker	EUSC	107,775	15	765,205	107,775	3000	107775	7500	7382
Chartered HSTEs	Chartered	40,000	14	235,000	40,000	3000	33099	4000	3937

	Trip Results (cont'd)							
	Load Rate (LT/hr)	Load Time	Travel Time	Transition Time	Lightering Time	Total Trip Duration	Ton-miles per trip	Trips per year
Average Large EUSC Tanker	7000	1.48	16.67	0.13	0.69	18.96	659602817	18.5
Average EUSC VLCC Tanker	7000	1.95	16.67	0.13	0.85	19.59	900857746	17.9
Average EUSC Suezmax Tanker	7000	1.07	16.67	0.13	0.58	18.44	453333380	19.0
Average EUSC Aframax Tanker	7000	0.81	16.67	0.13	0.61	18.21	323326056	19.2
Chartered HSTEs	7000	0.36	17.86	0.00	0.00	18.22	99295775	19.2

Model Capacity Output w/ 100% Efficiency		
Average EUSC VLCC Tanker	3264.4	Mbbls/month
Average EUSC Suezmax Tanker	1745.5	Mbbls/month
Average EUSC Aframax Tanker	1260.8	Mbbls/month
Chartered HSTEs	379.6	Mbbls/month

	# of HSTEs Replaced by Single, Average EUSC Tanker from Size Category over 100,000 dwt								
	Efficiency Factor								
Size Category	100%	90%	80%	70%	60%	50%	40%	30%	25%
Average EUSC VLCC Tanker	8.599	7.739	6.879	6.019	5.160	4.300	3.440	2.580	2.150
Average EUSC Suezmax Tanker	4.598	4.138	3.678	3.219	2.759	2.299	1.839	1.379	1.150
Average EUSC Aframax Tanker	3.321	2.989	2.657	2.325	1.993	1.661	1.328	0.996	0.830

Operating Costs Table		
Size Category	Cost per Day	per Month
Average EUSC VLCC Tanker	$47,643	$1,429,290
Average EUSC Suezmax Tanker	$31,142	$934,260
Average EUSC Aframax Tanker	$26,680	$800,400
Chartered HSTEs	$18,645	$559,350

	Potential Cost Savings of Replacing HSTEs w/ EUSC Tanker from Size Category over 100,000 dwt								
	Efficiency Factor								
Size Category	100%	90%	80%	70%	60%	50%	40%	30%	25%
Average EUSC VLCC Tanker	3,380,663	2,899,668	2,418,672	1,937,677	1,456,682	975,686	494,691	13,696	-226,802
Average EUSC Suezmax Tanker	1,637,691	1,380,496	1,123,301	866,106	608,911	351,716	94,520	-162,675	-291,272
Average EUSC Aframax Tanker	1,057,253	871,488	685,723	499,957	314,192	128,427	-57,339	-243,104	-335,987

Note: Daily costs are interpolated data from the ACOE Data for FY2000 Foreign Flag Tanker Costs (Double Hull)

EUSC Fleet of Tankers - Substitution of Tankers over 100,000 dwt for Handysized, Foreign Owned Chartered Tankers

Case Name: 1,500 nmi Distance to Theater

Model Variables		
Distance to Theater	1500	nautical miles
Weight of fuel	7.1	LT/barrel
Load rate	7000	LT/hr
Load Time	4	hr, minimum
Transition Time	3	hr, large vessels only

Vessel Characteristics							Trip Results		
SIZE CATEGORY	VESSEL OWNER	DWT	SPD	BARRELS	DWT	Distance	LT of Fuel	Pump Out (MT/hr)	Pump Out (LT/hr)
Average Large EUSC Tanker	EUSC	218,358	15	1,561,060	218,358	1500	219868	13500	13287
Average EUSC VLCC Tanker	EUSC	300,291	15	2,132,030	300,291	1500	300286	15000	14763
Average EUSC Suezmax Tanker	EUSC	147,513	15	1,072,889	147,513	1500	151111	11000	10826
Average EUSC Aframax Tanker	EUSC	107,775	15	765,205	107,775	1500	107775	7500	7382
Chartered HSTEs	Chartered	40,000	14	235,000	40,000	1500	33099	4000	3937

	Trip Results (cont'd)							
	Load Rate (LT/hr)	Load Time	Travel Time	Transition Time	Lightering Time	Total Trip Duration	Ton-miles per trip	Trips per year
Average Large EUSC Tanker	7000	1.48	8.33	0.13	0.69	10.62	329801408	32.9
Average EUSC VLCC Tanker	7000	1.95	8.33	0.13	0.85	11.26	450428873	31.1
Average EUSC Suezmax Tanker	7000	1.07	8.33	0.13	0.58	10.11	226666690	34.6
Average EUSC Aframax Tanker	7000	0.81	8.33	0.13	0.61	9.87	161663028	35.4
Chartered HSTEs	7000	0.36	8.93	0.00	0.00	9.29	49647887	37.7

Model Capacity Output w/ 100% Efficiency		
Average EUSC VLCC Tanker	5680.4	Mbbls/month
Average EUSC Suezmax Tanker	3184.9	Mbbls/month
Average EUSC Aframax Tanker	2324.7	Mbbls/month
Chartered HSTEs	731.1	Mbbls/month

	# of HSTEs Replaced by Single, Average EUSC Tanker from Size Category over 100,000 dwt								
	Efficiency Factor								
Size Category	100%	90%	80%	70%	60%	50%	40%	30%	25%
Average EUSC VLCC Tanker	7.769	6.992	6.215	5.439	4.662	3.885	3.108	2.331	1.942
Average EUSC Suezmax Tanker	4.356	3.920	3.485	3.049	2.614	2.178	1.742	1.307	1.089
Average EUSC Aframax Tanker	3.180	2.862	2.544	2.226	1.908	1.590	1.272	0.954	0.795

Operating Costs Table		
Size Category	Cost per Day	per Month
Average EUSC VLCC Tanker	$47,643	$1,429,290
Average EUSC Suezmax Tanker	$31,142	$934,260
Average EUSC Aframax Tanker	$26,680	$800,400
Chartered HSTEs	$18,645	$559,350

	Potential Cost Savings of Replacing HSTEs w/ EUSC Tanker from Size Category over 100,000 dwt								
	Efficiency Factor								
Size Category	100%	90%	80%	70%	60%	50%	40%	30%	25%
Average EUSC VLCC Tanker	2,916,473	2,481,896	2,047,320	1,612,744	1,178,168	743,591	309,015	-125,561	-342,849
Average EUSC Suezmax Tanker	1,502,326	1,258,668	1,015,009	771,350	527,692	284,033	40,375	-203,284	-325,113
Average EUSC Aframax Tanker	978,102	800,252	622,401	444,551	266,701	88,851	-88,999	-266,849	-355,775

Note: Daily costs are interpolated data from the ACOE Data for FY2000 Foreign Flag Tanker Costs (Double Hull)

EUSC Fleet of Tankers - Substitution of Tankers over 100,000 dwt for Handysized, Foreign Owned Chartered Tankers

Case Name: 5,000 nmi Distance to Theater

Model Variables		
Distance to Theater	5000	nautical miles
Weight of fuel	7.1	LT/barrel
Load rate	7000	LT/hr
Load Time	4	hr, minimum
Transition Time	3	hr, large vessels only

Vessel Characteristics							Trip Results		
SIZE CATEGORY	VESSEL OWNER	DWT	SPD	BARRELS	DWT	Distance	LT of Fuel	Pump Out (MT/hr)	Pump Out (LT/hr)
Average Large EUSC Tanker	EUSC	218,358	15	1,561,060	218,358	5000	219868	13500	13287
Average EUSC VLCC Tanker	EUSC	300,291	15	2,132,030	300,291	5000	300286	15000	14763
Average EUSC Suezmax Tanker	EUSC	147,513	15	1,072,889	147,513	5000	151111	11000	10826
Average EUSC Aframax Tanker	EUSC	107,775	15	765,205	107,775	5000	107775	7500	7382
Chartered HSTEs	Chartered	40,000	14	235,000	40,000	5000	33099	4000	3937

	Trip Results (cont'd)							
	Load Rate (LT/hr)	Load Time	Travel Time	Transition Time	Lightering Time	Total Trip Duration	Ton-miles per trip	Trips per year
Average Large EUSC Tanker	7000	1.48	27.78	0.13	0.69	30.07	1099338028	11.6
Average EUSC VLCC Tanker	7000	1.95	27.78	0.13	0.85	30.70	1501429577	11.4
Average EUSC Suezmax Tanker	7000	1.07	27.78	0.13	0.58	29.55	755555634	11.8
Average EUSC Aframax Tanker	7000	0.81	27.78	0.13	0.61	29.32	538876761	11.9
Chartered HSTEs	7000	0.36	29.76	0.00	0.00	30.13	165492958	11.6

Model Capacity Output w/ 100% Efficiency		
Average EUSC VLCC Tanker	2083.1	Mbbls/month
Average EUSC Suezmax Tanker	1089.2	Mbbls/month
Average EUSC Aframax Tanker	783.0	Mbbls/month
Chartered HSTEs	231.3	Mbbls/month

	# of HSTEs Replaced by Single, Average EUSC Tanker from Size Category over 100,000 dwt								
	Efficiency Factor								
Size Category	100%	90%	80%	70%	60%	50%	40%	30%	25%
Average EUSC VLCC Tanker	9.005	8.104	7.204	6.303	5.403	4.502	3.602	2.701	2.251
Average EUSC Suezmax Tanker	4.708	4.238	3.767	3.296	2.825	2.354	1.883	1.413	1.177
Average EUSC Aframax Tanker	3.385	3.046	2.708	2.369	2.031	1.692	1.354	1.015	0.846

Operating Costs Table		
Size Category	Cost per Day	per Month
Average EUSC VLCC Tanker	$47,643	$1,429,290
Average EUSC Suezmax Tanker	$31,142	$934,260
Average EUSC Aframax Tanker	$26,680	$800,400
Chartered HSTEs	$18,645	$559,350

	Potential Cost Savings of Replacing HSTEs w/ EUSC Tanker from Size Category over 100,000 dwt								
	Efficiency Factor								
Size Category	100%	90%	80%	70%	60%	50%	40%	30%	25%
Average EUSC VLCC Tanker	3,607,634	3,103,941	2,600,249	2,096,557	1,592,864	1,089,172	585,479	81,787	-170,059
Average EUSC Suezmax Tanker	1,699,416	1,436,049	1,172,681	909,313	645,946	382,578	119,210	-144,157	-275,841
Average EUSC Aframax Tanker	1,092,798	903,479	714,159	524,839	335,519	146,199	-43,121	-232,440	-327,100

Note: Daily costs are interpolated data from the ACOE Data for FY2000 Foreign Flag Tanker Costs (Double Hull)