Lifeline of the Nation: The U.S. Merchant Marine in the 21st Century

December 2007

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LIFELINE OF THE NATION:

THE U.S. MERCHANT MARINE IN THE 21ST CENTURY

PERSPECTIVE

The U.S. flag Merchant Marine — commercial vessels and the people who operate and maintain them — is a critical component of America's economic and military security. Indeed, the nation's Merchant Marine has been in the vanguard of the fight since the first sea battles of the Revolutionary War, and even before then it was the catalyst for commerce that fueled the engine of freedom.

This is as true today, in the "Post-9/11" era of global war against terror, as it was in the earliest days the Republic.

But the perspective must now be broadened to include the integrated, intermodal U.S. Marine Transportation System (MTS) — ships and crews, ports and harbors, dockworkers and cargo handlers, logisticians and managers, cranes and port infrastructures, trucks and railroads — and the complex web of national, regional, and international relationships that support "just-in-time" and "just-enough" supply-chain economies throughout the world. A lifeline of civilian commerce and military readiness that is crucial for our way of life, ships carry more than 90 percent of America's trade that moves through more than 300 ports from Maine to Guam. All but four of the largest U.S. cities have major ports for the movement of cargoes critical to U.S. and world economic vigor.

The United States is the world's greatest trading nation, in 2005-2006 accounting for some $2.6 trillion in exports and imports annually and more than 22 percent of the world's annual oceanborne trade (by volume). Half of this trade comprises manufactured goods carried in shipping containers, with some 25,000 individual containers handled in U.S. ports every day. The U.S. Maritime Administration (MARAD) estimates that in 2005 the U.S. MTS generated some than 13 million jobs that directly contributed more than $750 billion to the country's gross domestic product. Moreover, the U.S. economy is closely linked to the health of the intermodal MTS that ties the United States with the rest of the world — about which most Americans have little knowledge or care...so long as the shopping malls remain stocked and there are no lines at the gas pumps.

At the core of America's Marine Transportation System are the U.S. mariners and vessels flying the U.S. flag. But there are continuing and growing concerns about this national fleet. Once U.S. flag ships and American mariners moved the vast bulk of the country's seaborne trade; no more. A dramatic atrophying of America's merchant fleet began shortly after the end of World War II and accelerated during the 1970s and 1980s. In 1955, 1,072 commercial vessels, most less than 15 years of age, with an average cargo capacity of 12,700 deadweight tons flew the U.S. flag; by 1990, the fleet had withered to 449 ships, but with an average capacity of 42,400 tons, more than three times the efficiency of the 1955 fleet. By then, most of the mid-1950s fleet (which included many World War II vessels) had been transferred to other countries or scrapped due to age and technical obsolesence. In late 2006, 198 U.S. flag deep-sea, ocean-going vessels carrying commercial cargo — each capable of carrying, on average, 46,700 tons, but nearly half of which are older than 20 years — transported less than four percent of America's total seaborne international commerce, by volume. This excludes U.S. flag ships owned by or under charter to the U.S. Navy's Military Sealift Command or the Maritime Administration's Ready Reserve Force vessels.

At the same time that vital elements of the U.S. fleet are aging compared to foreign competitors, the manpower pool of American merchant mariners has also been "graying." In late 2006, the average age of the active workforce was 42 years, about six years older than the average in the mid-1990s. And the workforce is also diminishing as it gets older; the number of U.S. merchant mariners actively engaged in the oceangoing foreign trades dropped from 69,100 in 1970 to about 21,000 in 2006.

Such trends raise issues about national vulnerabilities in peacetime, crisis, and war.

The U.S. flag Merchant Marine is an essential link in the chain of American national security and the Armed Forces' ability to respond to crisis and conflict, any where, any time. "Without a merchant fleet, this country could not function," U.S. Navy Vice Admiral David L. Brewer III, then-Commander of the Navy's Military Sealift Command (MSC), stated in early 2006: "We want a strong U.S. merchant fleet in order to...guarantee our basic freedom and security."

During World War II, the Korean and Vietnam Wars, the 1990-1991 Persian Gulf War, and hundreds of Cold War and post-Cold War crises, as much as 95 percent of everything transported to military theaters of operations went by sea. In the aftermath of the September 2001 terrorist attacks, enough material has been transported in support of U.S. and coalition forces in Operations Enduring Freedom (OEF) in Afghanistan and Iraqi Freedom (OIF) to fill completely the 120 NCAA football stadiums in the United States some five times over, as of January 2006. Almost all of this went by ship and most was carried in commercial or government vessels flying the American flag. In fact, the OEF/OIF deployment was as large in size as World War II operations.

"Without a merchant fleet, this country could not function. We want a strong U.S. merchant fleet in order to...guarantee our basic freedom and security."

Vice Admiral David L. Brewer III
Commander, Military Sealift Command
2006

Combat, peace-enforcement, and stability operations as well as still-hoped-for national reconstruction would have been impossible without U.S. merchant mariners, civilian commercial vessels, and government-owned and –operated ships. The Navy's MSC and the Maritime Administration activated specialized Fast Sealift Ships (FSS), Ready Reserve Force (RRF) and Large Medium-Speed Roll-On/Roll-Off (RO/RO) vessels (LMSRs) to meet surge needs in both Afghanistan and Iraq. U.S. flag and other commercial owners and operators re-routed their vessels to transport military cargoes alongside commercial shipments to satisfy both immediate, surge-shipping needs as well as sustainment shipping for the initial battles of the Global War on Terror (GWOT) — and at the same time assuring that trade vital to the U.S. economy would not be interrupted.

A "Long War" against terrorists and other asymmetrical adversaries now shapes U.S. security strategies, and the American Merchant Marine will be important for global operations yet to come.

Humanitarian requirements, roles, and missions now complement traditional military strategic sealift tasks. The U.S. Merchant Marine has long been an important element in the country's responses to natural disasters and humanitarian needs — but no more so than in 2005, as dramatically underscored by the tsunami disasters in the western Pacific and Indian Ocean and support to first-responders when Hurricanes Katrina and Rita slammed into the U.S. Gulf Coast. Merchant mariners were ready and eager to provide critical capabilities that could be supplied in no other way. As one result of these experiences, U.S. government agencies and commercial organizations are addressing ways in which the U.S. flag Merchant Marine can contribute even more broadly, efficiently, and effectively in the future.

In a sense, America looks to sustain three U.S. flag fleets — one for peacetime commerce, one for wartime operations, and a third to respond to humanitarian needs — all ultimately based on a relatively small number of vessels and a shared handful of dedicated men and women who operate and maintain them.

While the security of U.S. ports has long been a concern, in the past it was perhaps focused more on crime and pilferage than other threats and challenges. Since 9/11, however, "port security" has come to mean much more: the ports and waterways, themselves, are now targets of terrorists intent on carrying out spectacular assaults for political aims, to be sure, but also to cripple the U.S. economy. The Los Angeles/Long Beach dockworker strike of 2002 gives an indication of what could result from attacks on America's ports, waterways, and maritime infrastructure. The direct impact of the 11-day labor action, which eventually spread to much of the West Coast, was about $1.9 billion per day, while the overall effect on the economy was estimated to be as much as $60 billion. The economic-security effects of coordinated terrorist attacks against even just a few of the nation's commercial — much less military — strategic ports would certainly reverberate throughout the United States and affect our trading partners world wide.

In addition, the safety of ships, crews, and cargoes at sea from pirates has been a problem for almost as long as ships have put to sea and continues to worry owners and operators. But the more modern threat of terrorists, perhaps operating in collusion with pirates, is also a growing concern — at least since the *Achille Lauro* and *Rainbow Warrior* incidents in 1985. Not even the USS *Cole* was immune from terrorist attack in October 2002.

Any program to maximize the security of our ports, waterways, and ships, however, must be balanced by the need for speed and efficiency of lawful cargoes reaching intended destinations.

It will be seen as a forlorn hope that we can rebuild the U.S. flag merchant marine to carry, once again, the preponderance of the country's trade and meet the requirements of the Merchant Marine Act of 1936. However, we do not

want to exacerbate our already great dependence on foreign flag and foreign-owned ships for our security needs. Complemented by various legislative initiatives since 1936, the Merchant Marine Act remains bedrock policy for the United States today. A country that cannot trade by its own means risks being held hostage by foreign interests — governments and cartels...criminals and terrorists. We cannot jeopardize giving up control of the U.S. economy to the whims of foreign interests that might be inimical to our own.

...it is necessary for the national defense and for the proper growth of its foreign and domestic commerce that the United States shall have a merchant marine (a) sufficient to carry its domestic waterborne commerce at all times, (b) capable of serving as a naval and military auxiliary in time of war or national emergency, (c) owned and operated under the United States flag by citizens of the United States insofar as may be practical, and (d) composed of the best-equipped, safest, and most suitable types of vessels, constructed in the United States and manned with trained and efficient citizen personnel. It is hereby declared the policy of the United States to foster the development and encourage the maintenance of such a merchant marine.

Merchant Marine Act of 1936

Our way of life and U.S. security are crucially dependent upon the effective, efficient, and unfettered movement of commercial and military cargos by sea. Among the most serious challenges we face today is having enough ships with the skilled people to operate them, linked to a robust and secure intermodal MTS, to meet our peacetime, crisis, and wartime needs. In short, a strong American-flag merchant fleet manned by U.S. crews is the foundation of U.S. economic and military security — an essential lifeline of the nation — in the 21st Century.

A GLOBAL ENTERPRISE

Seaborne commerce is the lifeblood of the global economic enterprise, and strategic maritime capabilities, including ownership of significant vessel tonnage, are instrumental in the growth of national trade. According to the United Nations Conference on Trade and Development (UNCTAD), maritime transport serves as a "trade enabler" and is almost always a factor in national trade promotion policies — as was the intent of the U.S. Merchant Marine Act of 1936 and other cargo-preference programs. In 2005, for example, the United States generated 12.5 percent of world trade and 22.1 percent of all vessel-borne commerce, while owning 10.1 percent of the world's merchant tonnage; but less than one-fourth of the total U.S. fleet operated under the U.S. flag. The United States

Liner Trades. Liner or "berth" service is defined as a scheduled operation by a common carrier whose ships operate on predetermined and fixed itineraries over given routes, at relatively regular intervals, and are advertised well in advance of sailing in order to solicit cargo from any source and at rates made available to the public. The liner fleet includes containerships, lighter aboard ships (LASH), roll on/roll off (RO/ROs), and barge-carrying vessels — all of which have good military utility. Vessels in the liner trades carry high-value cargo as to its worth and multi-faceted cargo as to its physical description, including packaged goods and refrigerated fruit and vegetables.

Bulk Trades. The bulk shipping industry is much less structured than the liner trades and is not organized along fixed sailing schedules. Rather, operators will employ specialized ships transporting a specific commodity where and when cargoes are available. Cargoes are shipped unpackaged either dry — e.g., iron ore, coal, grains — or liquid — such as crude oil, petroleum products, and liquid natural gas. Aside from tankers, the bulk fleet has less military utility compared to vessels engaged in liner service.

thus sustains a good ownership position, but to a much lesser extent a national flag position, in its reliance upon commercial shipping services, with only 25 percent of the U.S. fleet manned by American merchant mariners.

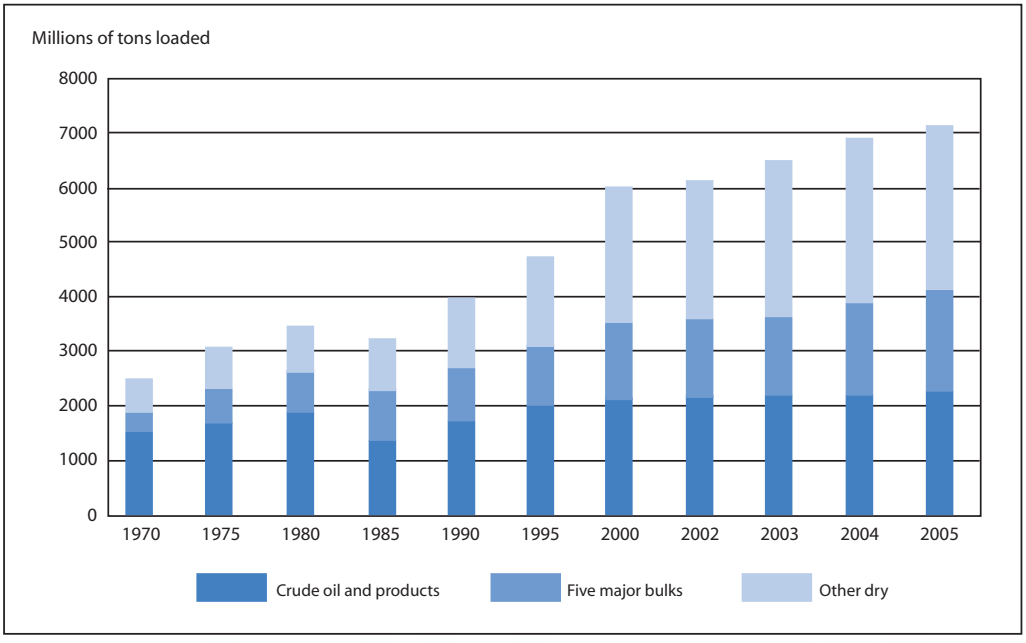
World Seaborne Trade

UNCTAD's 2006 Review of Maritime Transport reports that world seaborne trade grew by 3.8 percent in 2005, less than the 5.3 percent in 2004, but reached a record high of 7.11 billion tons for all cargoes. Total maritime activities expanded by six percent, increasing from 27,645 billion ton-miles in 2004 to 29,045 billion ton-miles in 2005. The global bulk trade in crude oil shipments increased in 2005 by 4.1 percent to 1.86 billion tons; the global trade in petroleum products increased by 5.8 percent to 565.3 million tons; and liquid natural gas shipments increased by 5.4 percent during 2005 to 178 billion cubic meters, about 6.6 percent of world production. In 2005, the overall world seaborne dry cargo — primarily iron ore, coal, grains, bauxite/alumina, and rock phosphate — shipments increased by 3.5 percent, to 4.69 billion tons. Some two billion tons of dry cargoes were also carried in containers along liner trades, with the total container international trades for 2005 estimated at 100 million 20-foot equivalent unit (TEU) containers. Figure 1 shows this growth in world seaborne trade.

The U.S. share accounted for 22.1 percent of world seaborne goods transported in 2005, the largest single-country total; Asian countries, 38.8 percent, and the European Union, 14.8 percent. U.S. Coast Guard projections indicate that total international seaborne trade through U.S. ports could double by 2025.

On the largest east-west route, the trans-Pacific, the total container flow reached 18.1 million TEUs, with the dominant leg to the United States totaling 13.8 million TEUs. The United

Figure 1. World Seaborne Trade by Cargo Groups



Source: Review of World Maritime Transport 2006 (UNCTAD, 2006), p. 6.

States-to-Pacific container traffic was less than one-third that amount, at 4.3 million TEUs. The Asia-Europe container trades showed a similar pattern: flows out of Asia to Europe accounting for 10 million TEUs and flows from Europe to Asia 5.7 million TEUs. The trans-Atlantic U.S.-Europe trade reached a total of 5.2 million TEUs: 3.8 million from the United States compared 1.8 million TEUs from Europe. (See Table 1.)

Increasingly, moreover, empty as well as full containers are being transshipped by rail across the United States, in both eastward- and westward-flows. The United States looks to becoming something of a "conveyor belt" for a growing Asian-European trade and repositioning of containers. The implications for cargo security along the U.S. land-bridge of the "conveyor belt" and the potential for terrorist use of these flows to attack inland targets are worrisome, in addition to placing growing burdens on existing rail and truck "sub-systems" of the U.S. MTS.

World container port traffic continued to expand at a rate of 12.6 percent in 2004, reaching 336.9 million TEUs. Ports of the developing countries and territories handled 137 million TEUs, or almost 41 percent of the total. In 2004, there were 56 developing countries and territories with annual throughputs of 100,000 TEUs or more. In 2005, the world's top 20 container ports handled more than 186 million TEUs. Only three U.S. ports — Los Angeles, Long Beach, and New York — were ranked among the top 20; but these three U.S. ports combined (18.99 million TEUs) were overshadowed by both Singapore (23.19 million TEUs) and Hong Kong (22.43 million TEUs), each.

World Merchant Fleets

UNCTAD analysis shows that world merchant fleets expanded to 960 million deadweight tons (DWT) at the beginning of 2006, an increase of 7.2 percent over the previous year and the largest increase since 1989, when the world's merchant fleets started to recover from the slump of the 1970s and 1980s. New ship construction increased to 70.5 million DWT, while tonnage broken up or lost was only 6.3 million DWT, a net gain of 64.2 million DWT.

The tonnage of oil tankers increased by 5.4 percent and that of bulk carriers by 7.9 percent during 2005. The general cargo fleet increased

Table 1. Container Flows in Major Trade Routes (Millions of TEUs)

	Trans-Pacific		Asia-Europe		Transatlantic	
Year	Asia - USA	USA - Asia	Asia - Europe	Europe - Asia	Asia - Europe	Europe - Asia
2004	12.4	4.2	8.9	5.2	1.7	3.2
2005	13.9	4.3	9.9	5.6	1.8	3.3
% Change	12.1	2.4	11.2	7.7	5.9	3.1

Source: Review of World Maritime Transport 2006 (UNCTAD, 2006), p. 81.

by 4.5 percent, reversing the trend of the previous decade; general cargo ships in 2005 accounted for 10 percent of world fleets. The size of the world container fleet grew by 9 percent during 2005, reaching a capacity of 21.6 million TEUs; in terms of tonnage, containerships increased by 13 million DWT, or 13.3 percent, representing 11.6 percent of the world's fleet in 2005. Container ship size continued to increase, with the average carrying capacity growing from 2,235 TEUs in 2005 to 2,324 TEUs in 2006. Ships on order or being designed continue this increase in size, as concepts with capacities of 14,000 TEUs were contemplated.

In 2005, the average age of the world fleet dropped marginally to 12.2 years, with more than 27 percent of the fleet 20 or more years old. General cargo vessels had the highest average age (17.5 years) and container ships the lowest (9.4 years); the average age of tankers was 10 years of age. Containerships accounted for 32.2 percent of all tonnage shared among all categories of ships less than five years age.

THE U.S. MERCHANT MARINE

In 2006, the U.S.-owned foreign-flag fleet (vessels greater than 1,000 GRT) numbered 1,054 vessels of all types (36.8 million DWT); another 625 vessels (10.2 million DWT) sailed under the U.S. flag with crews of U.S. mariners. The 1,679 ships in U.S. fleet (all flags) accounted for just 5.2 percent of the world fleet. The 2005 privately owned commercial self-propelled and non-self propelled U.S. flag fleet engaged in core operating trades — deep-sea foreign, deep-sea domestic and Jones Act (contiguous continental U.S., Alaskan and Hawaiian cabotage trades reserved for U.S. flag, U.S. owned, and U.S. crewed merchant shipping), Great Lakes, and inland rivers — is shown in Table 2.

Table 2. U.S. Flag Merchant Fleet, Foreign and Domestic Ocean Trades, 2005

	US Flag Vessels (1,000 GRT or Greater	Cargo Capacity (1,000,000 DWT)
Tankers	114	5.5
Roll-On/Roll-Off	55	1.2
Dry Bulk Carriers	17	0.7
Containerships	104	3.9
General Cargo	10	0.2
Total	300 Vessels	11.5 million DWT

Source: U.S. Maritime Administration, 2006.
Excludes passenger ships.

Looking at just deep-draft, ocean-going vessels of 10,000 DWT or greater, MARAD data show that as of end-2006 only 198 ships totaling about 9.2 million DWT of cargo capacity operated under the U.S. flag. Of these, 105 (5.4 million DWT) were U.S.-built vessels eligible for Jones Act domestic trades. From 2001 to 2005, the U.S. flag privately owned ocean-going merchant fleet declined by 26 vessels (1.0 million DWT): the Jones Act/U.S. cabotage fleet declined by 27, while the non-Jones Act fleet (foreign trade vessels) increased by one ship. Although the total number of deep-draft ocean-going ships under the U.S. flag has continued the downward trend, from 764 ships (13.8 million DWT) in 1970, the U.S. shipbuilding industry has been experiencing something of a renaissance of late, with 13 U.S. flag deep-draft vessels on order or under construction in 2006, accounting for nine percent of the existing fleet.

And yet the fleet is "graying": 47 percent of the total U.S. flag fleet in 2005 was older than 20 years, and 59 percent of the Jones Act fleet was 20 years old or more.

A "Graying" Workforce, Too

The pool of skilled labor actively employed on U.S.-flag vessels is a national security asset, able to meet surge-shipping requirements during times of emergency. According to MARAD data, as of the end 2006 an estimated 21,000 people were actively employed in the oceango-ing, deep-draft foreign trades, compared to 69,100 in 1970. Real wage and benefit declines, increased licensing and documentation require-ments, limited long-term career prospects in a shrinking fleet, the fading lure of life at sea, restrictions on shore leave due to security mea-sures and rapid port turn-arounds, and the at-tractiveness of shoreside jobs all continue to contribute to the shrinking of the workforce.

In general, moreover, the number of available billets on ocean-going ships has also been affect-ed by shipboard automation and the informa-tion "revolution" that has seen average crew size shrink from 45 people in 1970 to about 20 today, with some highly automated, optimally manned ships requiring as few as 12-15 crew members. For example, due to reduced-manning econo-mies of scale through the introduction of inno-vative tug and barge combinations called "ITBs" (integrated tug-barge units) and the even newer "ATBs" (articulated tug-barge units), the last several decades have seen a marked decline of U.S. coastal tankers. Many of the single-hulled deep-sea ships that once plied the near-shore wa-ters of the United States in great numbers have been replaced by ITBs and ATBs requiring less than half as many crew members. The skilled labor pool in these trades has thus been "hit" in two dimensions: a smaller number of deep-sea ships, which can tranport more tonnage than the older vessels being phased out, and significantly smaller crews on the ITBs and ATBs that now populate near-shore operations.

And this workforce is getting older — an average of 42 years in 2006, about six years older than in the mid-1990s — and looks to age even more in the years ahead. In some critical skill areas, such as steam propulsion systems still found in the older vessels, the pool of qualified merchant mariners is "graying" even more quickly.

The trend of fewer, often larger, ships manned by fewer, often older, people has exacerbated the decline in qualified merchant mariners. MARAD data indicate that in 2006 there were approximately 2.3 qualified people for every ac-tive seagoing billet in commercial service. Navy analysis indicates that this is sufficient to sup-port the activation of the Ready Reserve Force and surge sealift ships required for current war plans and global contingencies, for now. Still, these developments and trends raise concerns about the ability of the U.S. flag Merchant Ma-rine to continue to satisfy the military security requirements of the United States, as well as to meet new "mission areas" of humanitarian- and disaster-response.

U.S. Government "Merchant" Fleets

Complementing the capabilities of the privately owned and operated U.S. flag Merchant Marine to satisfy national security requirements, the U.S. Navy's Military Sealift Command in December 2006 operated a fleet of about 110 ships for the routine worldwide peacetime needs of the military services; importantly, many of these were immediately ready to respond to crisis and conflict. The U.S. Maritime Administration also maintained 44 Ready Reserve Force vessels in reduced operating status (ROS), which when activated are operated by MSC. The government-owned and contractor — operated ships in essence fill in the "gaps" in the U.S. Merchant Marine's ability to meet day-to-day commercial, emergency surge, and military sustainment shipping requirements simultaneously.

Military Sealift

The mission of Military Sealift Command, the sea transportation component of the United States Transportation Command (USTRANSCOM), is to provide ocean transportation and sea-based logistics solutions for equipment, fuel, supplies and ammunition to sustain U.S. forces worldwide during peacetime and in war. The requirements of the Global War on Terror have already dramatically shaped the need for vessels and the highly skilled, motivated, and committed people who serve on them or labor on shore to make their voyages efficient and effective. In meeting these needs, MSC operated four programs in late 2006:

■ Naval Fleet Auxiliary Force Program (NFAF): 37 ships that, in addition to sustaining U.S. and coalition warships in forward operating areas, also provide vital life-sustaining supplies and medical treatment in humanitarian-assistance and disaster-relief operations. The NFAF program includes 14 fleet oilers (T-AO), five ammunition ships (T-AE), five combat stores ships (T-AFS), four fleet ocean tugs (T-ATF), four fast combat support ships (T-AOE), two rescue-salvage ships (T-ARS), one dry-cargo/ammunition ship (T-AKE-1), and two hospital ships (USNS *Comfort*, T-AH 20 and USNS *Mercy* T-AH 19).

■ Special Mission Program: 24 ships, most crewed by contracted mariners and augmented by U.S. military personnel to carry out specialized tasks, including oceanographic and acoustic survey, ocean surveillance, submarine support, missile range instrumentation, navigation test support, command-and-control, cable-laying and repair, and high-speed logistics support (HSV-2 *Swift*).

■ Prepositioning Program: a total of 35 ships that includes 16 Maritime Prepositioning Ships in three squadrons at three operating sites — Mediterranean Sea, Diego Garcia in the Indian Ocean and Guam/Saipan in the Western Pacific Ocean — each of which carries sufficient equipment and supplies to sustain about 15,000 Marine Corps Air Ground Task Force personnel for up to 30 days; ten Army Prepositioned Stock Ships (T-AKR and T-AK), which comprise four large medium-speed, roll-on/roll-off ships and two container ships; ten Navy/Defense Logistics Agency/Air Force Ships comprising one Defense Logistics Agency tanker (T-AOT), four U.S. Air Force container ships (T-AK), one U.S. Navy break-bulk ship (T-AK), two Marine Corps aviation logistics support ships (T-AVBs), and one high-speed catamaran (*Westpac Express*).

■ Sealift Program: 27 government-owned — operated and three long-term, commercially chartered dry cargo ships and tankers for day-to-day missions, crisis-response, and long-term combat sustainment. This program supplies Tanker (4 *Champion* class tankers, which are government-owned), Dry Cargo (19 ships), and Surge (15 LMSRs and eight 30-knot Fast Sealift Ships) capabilities. When these assets need to be augmented, MSC's Dry Cargo Project Office makes every attempt to use as many U.S. flagged vessels as possible in order to support the U.S. maritime industry. When needed, however, foreign-flagged vessels may be chartered. At Congress' direction on 1 October 2007 these eight Fast Sealift Ships were transferred to MARAD control.

Many of these ships — as well as the MARAD RRF ships — are maintained in four-, five- and ten-day reduced operating status (ROS) by small, core crews drawn from the U.S. Merchant Marine, a concept that was proven in the 1990-1991 Persian Gulf War, Operations Desert Shield and Desert Storm. Since then, MSC has improved the concept and capabilities of the ROS crews on board selected MSC and MARAD/RRF ships. ROS is a hybrid operational methodology that keeps vessels in a high state of readiness without the need for a full crew on board during periods in which the vessel is on "stand by" pier side. MSC and MARAD carefully tailor the ROS crew and the maintenance, preservation, and training cycles they perform for specific vessel types and even individual ships. Individual ROS crews usually top off at no more than ten people (with 15 for each FSS and 13 for each LMSR), but the result

is a vessel that is "mission ready" to be "broken out" and placed in full operating status with a full crew within a very short period of time.

MSC is the single largest employer of U.S. merchant mariners in the United States, and the command continues to need an increased Civil Service Mariner (CIVMAR) workforce in response to the increasing transfers of "regular" Navy auxiliary vessels and new-construction vessels assigned to the MSC. In December 2006, about 4,500 CIVMARs were employed on MSC ships, and the command anticipated an additional 1,340 civil-service mariners will be needed to crew additional ships coming under MSC's aegis during the next five years. Since the "Charger Log" exercises in the 1970s, MSC has demonstrated that many types of Navy ships traditionally manned by uniformed Navy military personnel can be operated and maintained by CIVMARs at significantly reduced/optimized manning levels, resulting in substantial operational and total-ownership costs but providing the same or greater levels of service. In addition, various "flexible manning" initiatives will continue to drive MSC's Civilian Substitution Program that has transferred the traditional communications functions of MSC vessels performed by USN military detachments to MSC CIVMAR communications technicians as well as converting some USN supply billets to civilian yeoman/storekeepers. These and other manpower programs will only increase MSC's reliance upon the Merchant Marine for skilled and motivated people, in addition to those that MSC directly recruits and trains for CIVMAR careers.

MARAD Operations

The mission of the Maritime Administration's Office of Ship Operations is to provide ready, reliable, and cost-effective sealift transportation to meet national security contingency and civil transportation requirements for the Department of Defense. In addition, MARAD is investigating ways in which it can build on the success of its humanitarian response to Hurricanes Katrina and Rita in 2005. The Office's strong focus is on ensuring a healthy commercial sealift capability, while its Ready Reserve Force — an important component of the U.S. National Defense Reserve Fleet (NDRF) — provides an best-value government-owned and -operated sealift solution to complement what is commercially available. (The government established the NDRF program after Word War II, a provision of the 1946 Mechant Ship Sale Act, to acquire for long-term storage and possible use in a national emergency selected commercial vessels as they were retired At the height of the program in the early 1950s, the NDRF numbered more than 2,200 ships.)

In late 2006, MARAD maintained the RRF fleet of 44 militarily useful vessels: roll-on/roll-off ships, crane ships, break-bulk ships, heavy-lift ships, Offshore Petroleum Discharge tankers, and aviation logistics support ships. All of the RO/ROs are kept in a five-day reduced operat-

ing status with ten-person crews aboard; other ships are maintained in 10- or 20-day ROS, but without cadre crews. The balances of the crews are "sourced" from the U.S. Merchant Marine. Mariner crews report to the ships, break out all needed equipment, activate all mechanical systems, take on supplies and fuel, and prepare to take the ships to sea. During the final breakout phase, the ships undergo sea trials to test if the ship is indeed ready for the mission. When ships are fully operational and have passed sea trials, they can officially transfer from MARAD to MSC operational control.

During Operations Desert Shield/Desert Storm (ODS), for example, MARAD activated 79 of the then-96 RRF ships, achieved 93 percent full operating capability, and transported 25 percent of the unit equipment and 45 percent of the ammunition to support combat operations. In terms of overall ODS performance, MSC and MARAD assets carried 47 percent of all military cargoes; the U.S. flag Merchant Marine, 32 percent; and foreign-flag charters, 21 percent. (Some foreign ships under MSC charter, however, refused to enter the Persian Gulf and transshipped cargoes to other ships.) Since then, MARAD and MSC conducted nearly 400 RRF activations, some 265 of which were no-notice activations. All but three were successful in meeting timelines and operational capability requirements — an excellent performance repeated in Operations Enduring and Iraqi Freedom.

RRF ships are berthed at strategic locations around the U.S. coasts, near Army loading ports and other loading sites approved by the U.S. Transportation Command. When activated, they come under MSC's operational control. MARAD's 2006-2007 RRF force structure included:

- 27 RO/RO (all in ROS 5)
- 6 Auxiliary Crane Ships T-ACS (ROS 5)
- 2 Aviation Logistics Support Ships T-AVB (ROS 5)
- 2 LASH/Containership Mods (RRF 10)
- 2 Sea Barge Clipper Ships SEABEE (ROS 5)
- 2 Offshore Petroleum Discharge Ships OPDS (1 in PREPO fleet and 1 in RRF 10)
- 3 Break-Bulk ships (1 in PREPO fleet, 2 in ROS 5)

These government-owned and contractor-operated fleets are critical national security "gap-fillers" for the commercial U.S. flag Merchant Marine. However, the cost of maintaining the existing MSC and MARAD RRF fleets, as well as to acquire new vessels to meet future needs, is problematic. Operations in Iraq and Afghanistan in early 2007 were projected to cost some $15 billion per month until the troops were brought home. The costs of the Long War against terror can hardly be estimated with any accuracy or precision, but look to be substantial. The rebuilding of the Gulf Coast will cost in excess of $200 billion, while critical infrastructure throughout the United States needs widespread repair and replacement, also totaling hundreds of billions of dollars. The President's announcement in late 2006 that the United States will return to the moon and establish a base of operations there could also cost many billions more. The adage — "Do more with less!" — looks to become mantra for the government's merchant mariners.

Little wonder then, that the National Defense Transportation Association in February 2003 warned — "The United States Military would be unable to deploy and sustain its forces worldwide without using privately owned, U.S.-flagged commercial vessels." — a truth confirmed in recent operations at home and overseas.

IN PEACE AND WAR...

Two world wars before the last century reached its mid-point, two major conflicts and hundreds of crises during the next 50 years of Cold War, and numerous Post-Cold War emergencies and conflicts underscore the critical role of the U.S. Merchant Marine in achieving strategic, operational, and tactical goals in support of the nation's security and defense. Ships carried fully 95 percent of all military equipment and supplies sent to theaters of military operations, a performance repeated during Operations Enduring Freedom and Iraqi Freedom — the nation's military responses to terrorist attacks on America.

The United States Military would be unable to deploy and sustain its forces worldwide without using privately owned, U.S.-flagged commercial vessels.

National Defense Transportation Association February 2003

National security and military strategies put in place since September 2001 envision a Long War of global dimensions against ambiguous yet dangerous adversaries — stateless terrorists and states that sponsor them, failing states that undermine regional stability, and a variety of violent extremists, insurgents, pirates, criminals, and paramilitary forces intent on doing us and our friends harm. We also know, however, that we must plan for conflict with a more

conventional military "peer competitor" that might emerge in the future. For these reasons and more, MARAD's National Security Strategic Objective underscores the need to "Assure that sufficient sealift capability and intermodal transportation infrastructure exist to support vital homeland and National security interests."

The traditional military-security requirements for peacetime supply, surge sealift, and long-haul sustainment are now complemented by nascent roles and missions for humanitarian relief and disaster response. In 1998, for example, four RRF ships manned by U.S. civilian merchant marine crews were activated to carry military construction equipment and supplies to Central America in the wake of Hurricane Mitch. If anything, the nation's humanitarian responses since then to terrorist attacks and hurricanes at home and to tsunamis and earthquakes on the other side of the world make it clear that the U.S. Merchant Marine is needed, more than ever, to meet the nation's imperatives for a broadly defined concept of security in the 21st Century.

National Security Strategic Objective: Assure that sufficient sealift capability and intermodal transportation infrastructure exist to support vital homeland and national security interests.

U.S. Maritime Administration

In something akin to a "Reverse 2006 RRF," these government-owned and -operated ships could also comprise a "Strategic Commercial Shipping Reserve." Much like the Strategic Petroleum Reserve, the RRF could be activated to complement U.S. flag vessels during a future crisis in which other governments or foreign-flag operators withhold shipping services to America, in essence attempting to hold the U.S. economy hostage. Indeed, the precedent for the use of government shipping assets to carry non-DoD cargoes in such an economic crisis might have already been set by the nation's responses to humanitarian needs and natural disasters at home and overseas.

Heroic Response to Terror

For ten days after terrorists highjacked aircraft and destroyed the Twin Towers, midshipmen and staff at the U.S. Merchant Marine Academy at Kings Point worked side-by-side with the U.S. Coast Guard, the marine division of the New York City Fire Department, and untold numbers of dockworkers, ferry crews, and other ship operators and crews to carry off the greatest single movement of refugees in the history of the United States. Coast Guard estimates show that as many as a 500,000 people were moved by water from "Ground Zero" and other affected areas in Manhattan to safety during the first 24 hours of the crisis; another half-million were rescued during the next few days. Although the Coast Guard immediately closed the port of New York, operations were allowed to restart three days later because of a critical need for fuels in upper New York state and New England that could be satisfied only through ship deliveries.

...you moved firefighters and police and emergency response teams into Ground Zero. You moved tons of food and water and supplies. Your heroic response that day showed the spirit of America.

President G. W. Bush
2006

The Military Sealift Command also activated the Baltimore-based hospital ship USNS *Comfort*, which reached New York City within days of the tragedy. The ship's Civil-Service mariner crew and medical staff provided sleeping quarters, meals, laundry services, and medical treatment to relief workers.

As the President remarked at the 2006 graduation ceremonies at the U.S. Merchant Marine Academy, "...you moved firefighters and police and emergency response teams into Ground Zero. You moved tons of food and water and supplies. Your heroic response to that terrible day showed the spirit of America."

Supporting Freedom

During the first Persian Gulf War, more than 350 ships in more than 500 voyages delivered an average of 42,000 tons of cargo each day. Sealift accounted for 6.1 million tons of petroleum products and 3.5 million tons of dry cargo, of which 69.2 percent was carried in U.S. flag ships with American crew members. Improved charter and shipping agreements, particularly the Special Middle East Shipping Agreement (SMESA) with U.S.-flag intermodal shipping companies, greatly facilitated efficient responses and operational flexibility. In all, more than one million tons of dry cargos in more than 37,000 individual containers were carried by 66 U.S. flag containerships making 260 voyages. Another 40 foreign-flag "feeder" ships took cargoes from major intermodal terminals to the war zone. MSC chartered 22 additional U.S. flag dry cargo ships and ten tankers, and by war's end chartered another 182 foreign-flag ships that made 253 voyages and carried 19 percent of all dry cargo sent to Gulf. At the height of the conflict, there was a ship every 50 miles along an 8,000-mile sea lane between the United States and the Persian Gulf.

The lessons learned from the 1990-1991 war and the results of strategies, plans, and programs put in place since then contributed significantly to marine transportation success in Operations Enduring Freedom and Iraqi Freedom a decade later.

From September 2002 through June 2003, U.S. ships carried 22.3 million square feet of dry cargo, a total that grew to 61 million square feet of dry cargo and 1.1 billion gallons of fuel by the end of the first year of combat and peace-enforcement operations. MSC ships transported virtually every tank and nearly all the helicopters and "HUMVEES" used to liberate Baghdad. During the peak days of the military buildup in the U.S. Central Command area of operations, in the fall 2002-winter 2003, MSC employed nearly 100 ships to transport cargo to Southwest Asia, in addition to ships supporting MSC's routine day-to-day operations.

MARAD initially activated and handed over to MSC operational control of 36 ships from the RRF, and at the peak of OIF combat a total of 40 RRF ships were active.

MARAD and MSC worked to maximize an "All-U.S. flag" service to the Gulf, relying primarily upon U.S. flag liner service and U.S. government-owned, commercial contractor-operated ships, but also accepting open-market responses by foreign flag carriers. They implemented critical force-protection initiatives, including crew vetting and screening with law enforcement and governmental intelligence agencies, and ensured that at least one officer on each U.S. flag ship had security clearances should it be necessary to provide sensitive information about threats and other issues.

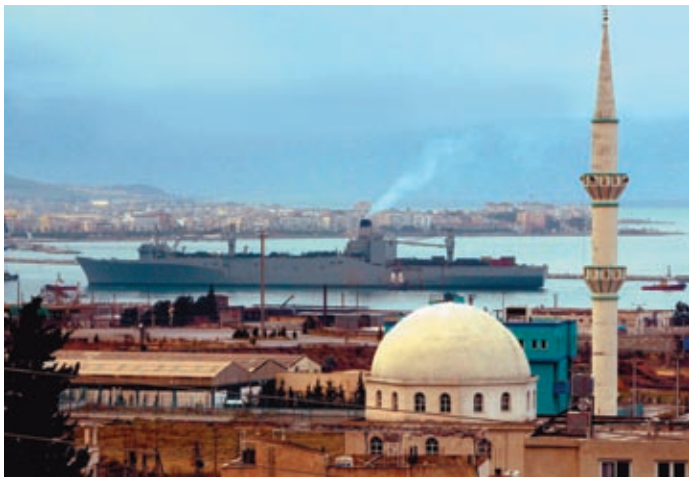
MSC provided MARAD with protective equipment and Chemical, Biological, Radiological Defense (CBRD) training for RRF crews, taking advantage of ongoing programs at the U.S. and state merchant marine academies and merchant marine industry schools. U.S. Navy Reserve units also supported the rapid CBRD training of crews, just in case conjecture became reality. In some cases, U.S. commercial operators themselves stood-up on-board physical security teams and conducted CBRD training. Because of the perceived threat of biological weapons, MSC medical teams vaccinated U.S. Merchant Marine crews at American ports and in-theater "catch points."

From 1 January 2003 to "Mission Accomplished" on 1 May 2003, U.S. flag vessels delivered 83.9 percent of the 25.9 million square feet of cargo shipped. This included nearly 200,000 pallets of munitions and food to Navy combat ships at sea, as well as wheeled and tracked combat equipment, rolling stock such as bridge sections and artillery pieces, and containers of other unit cargo and munitions to U.S. ground-based forces. According to MSC data, in all more than 250 ships were involved in the initial OEF/OIF cargo movements, including combat logistics force ships serving the Navy fleet.

During this initial phase of the operation, MSC tankers and fleet replenishment oilers delivered 378 million gallons of fuel. Naval Fleet Auxiliary Force oilers pumped nearly 120 million gallons to support Navy warships and their embarked aircraft. MSC-owned and commercially chartered tankers also delivered more than 260 million gallons for use by ground and air forces

engaged in combat. In one unusual operation, an MSC fleet replenishment oiler even resupplied a U.S. nuclear-powered attack submarine on extended patrol and running short of food and consumables.

Photo courtesy of Reuters



Not all went as planned. For example, in early 2003 more than 4.3 million square feet of vital military cargo for the U.S. Army's 4th Infantry Division's gear was loaded on board RRF RO/RO and chartered ships to be off-loaded in the Turkish port of Iskenderun, to enable U.S. troops to outflank Saddam's forces and move into Iraq from the north. However, because of a litany of issues between Washington and Istanbul, exacerbated by the discovery that one of the foreign-chartered ships was registered under the Greek Cypriot flag, the Turkish government refused to grant U.S. forces permission to move anything through Iskenderun — a graphic example of how foreign political sensitivities can frustrate U.S. military strategies, plans, and operations. The 4th ID's ships languished off the coast of Crete for a month before transiting the Suez Canal, sailing around the Arabian peninsula and into the Persian Gulf, and off-loading their cargo in Kuwait in March.

High-tempo operations have continued, and during fiscal year 2005 MSC Central Command coordinated 172 cargo operations, delivering 20.2 million square feet of combat equipment and some 740 million gallons of fuel for Operations Enduring Freedom and Iraqi Freedom. Cargo totals included 93,229 wheeled vehicles, 795 helicopters, and 8,448 tracked vehicles delivered to nine ports. Through mid-2006, 98 RRF ship activations and re-assignments generated more than 13,120 ship operating days at a 99.4 percent reliability rate, higher than anticipated.

In this, U.S. Merchant Marine crews and their ships have been crucial for the success of the transport of vital military cargoes, and, in other critical operations, to meet humanitarian needs.

Humanitarian Response

Global Reach

The day after Christmas 2004, a devastating earthquake off Indonesia spawned a tsunami that killed more than 300,000 people in six countries and left millions more homeless. American merchant mariners were instrumental in supporting the multinational response to natural disaster and human suffering on a massive scale.

In the first months of 2005, the United States was executing the largest military force rotation since World War II, with thousands of troops and their equipment in transit to and from the Persian Gulf, an operation that had already begun to stress existing sealift capabilities. Still, the Military Sealift Command's civilian merchant mariners played a significant role in Operation Unified Assistance, America's response to the tsunami-stricken region. Almost immediately, MSC deployed six ships from Maritime Prepositioning Ship Squadron Three in Guam to deliver water and other supplies critical to life. In addition, MSC positioned the survey ship USNS *John McDonnell* in the vicinity of Banda Aceh, Indonesia, to support hydrographic surveys of navigational routes affected by the tsunami. MSC also provided logistical and repair support to the combat stores ships USNS *Niagara Falls* and USNS *San Jose*, which conducted underway replenishment and helicopter "VERTREP" support for the relief operations on shore. The high-speed catamaran HSV-2 *Swift* likewise provided logistics, shuttle, and helicopter maintenance support for the humanitarian assistance and disaster-relief efforts. (Six months later, *Swift* would be the command ship in the multi-agency response to Hurricanes Katrina and Rita.) In all, civilian

mariners manning MSC ships delivered 3,084 pallets of material during the relief efforts, including 305,000 gallons of water, 913 tons of food, 355 tons of general supplies, and 14 tons of medical supplies.

MSC activated the hospital ship USNS *Mercy* for Unified Assistance, the ship departing San Diego on 5 January 2005. During her five-month deployment to Southeast Asia, *Mercy's* medical staff treated more than 100,000 patients, performed 466 surgeries and 6,000 dental procedures, provided 4,041 pairs of glasses, gave more than 12,600 immunizations, and provided preventative and public health training. Civil service mariners aboard *Mercy* also contributed to humanitarian relief efforts, repairing infrastructure and medical equipment in hospitals, clinics, and other public buildings.

Sailing home, *Mercy* stopped at several ports to provide humanitarian assistance. In Alor, Indonesia, and Dili, East Timor, *Mercy's* medical teams treated more than 8,000 patients in six days. When an 8.7 magnitude earthquake struck Nias Island, Indonesia, on 28 March, *Mercy* sailed to assist, performing 123 surgeries and more than 19,000 other medical procedures during April. *Mercy* conducted a final humanitarian mission in Madang, Papua New Guinea, where the ship's medical staff treated more than 22,700 patients and performed 36 surgeries, and the ship's crew provided other assistance to islanders who had been forced to flee their homes following a major volcanic eruption in October 2004.

In addition to *Mercy's* direct impact on the lives of thousands of people, there was a public-opinion windfall for the United States. Polls of several thousand people conducted in the fall 2006 showed that that Muslims throughout the region had a much more favorable perception of America as a result of *Mercy's* mission, counterbalancing the impact of radicals and extremists who would vilify the United States.

Such global humanitarian care — and the positive "spillover" benefits for the nation — would not have been possible without the U.S. Merchant Marine, as U.S. merchant mariners comprised the crews of all of these ships.

Nor could it be possible in the future. Mercy's and *Comfort's* experiences half a world apart in 2005 convinced the Chief of Naval Operations in late 2006 to reconsider plans to decommission MSC's hospital ships. Instead, the Navy intends to send each ship on worldwide humanitarian missions once each year — *Mercy* on the west coast to Pacific rim and Asia, *Comfort* on the east to the Mediterranean, Middle East, South America, and Africa — and more frequently if emergencies require.

Relief at Home

Even before Hurricane Katrina slammed into the Gulf Coast on 2 September 2005, planners, logisticians, and operators in the Maritime Administration, Military Sealift Command, Strategic Sealift Office in the Pentagon, and industry met to review various scenarios and choose courses of action. This was the first time that RRF vessels would be mobilized for domestic humanitarian relief, and it took an "all-hands" effort in Washington to navigate the bureaucratic "maze." But it was tremendously successful.

As plans came together and Katrina made landfall, the fast sealift ship USNS *Pollux* and MARAD's National Defense Reserve Fleet ships *Cape Kennedy*, and *Cape Knox* remained pierside nearby New Orleans, providing shelter to emergency responders, fuel to power emergency generators at local hospitals, and water pressure to keep kidney dialysis machines operating until patients could be evacuated days later. They also allowed MARAD to provide the Department of Transportation's Crisis Management Center with real-time information regarding the situation in New Orleans.

After riding out the hurricane alongside the pier, *Pollux* provided air-conditioned berthing to National Guard and Army personnel, Federal Emergency Management Agency workers, local police, and other governmental and civilian first-responders and relief workers. The ship provided meals, laundry services and a place to shower, and, in just the first week, *Pollux* provided more than 220,000 gallons of diesel fuel for first-responders' vehicles. The fast sealift ship USNS *Altair* also provided food, fuel and water to the New Orleans area and hotel services to relief workers. Under the aegis of the Navy's Mine Warfare Command, the HSV-2 *Swift* served as the command-and-control platform for U.S. military forces deployed to the stricken region. In nearby Pascagoula, Mississippi, the hospital ship USNS *Comfort's* medical staff treated 1,452 patients aboard the ship in addition to 376 patients at a temporary medical facility ashore. Also providing support were MSC's fast combat support ships USNS *Arctic* and USNS *Supply*; the fleet replenishment oiler USNS *Patuxent*; fast sealift ships USNS *Algol* and USNS *Bellatrix*; and the large, medium-speed, roll-on-roll/off ship USNS *Pililaau* — all with civilian mariners drawn from the U.S. Merchant Marine.

Ten of MARAD's RRF/NDRF ships and their U.S. Merchant Marine crews supported Katrina/Rita relief operations:

- The auxiliary crane ships (T-ACS) SS *Equality State* and SS *Diamond State* T-ACS, provided mobile crane capability
- The RO/RO ships *Cape Kennedy* and *Cape Knox* provided command post, rolling stock, and power generation
- Another RO/RO, *Cape Vincent*, provided command post, rolling stock, and Coast Guard helicopter landing facilities
- The aviation support ship SS *Wright* provided relief worker hotel facilities, fresh-water production, and a helicopter landing platform

- Training ships from three state merchant marine academies — TS *Sirius*, TS *Texas Clipper II*, and TS *State of Maine* — provided relief worker hotel facilities

In all, these ships and their civilian merchant marine crews provided 866 ship days of operations, more than 83,000 worker-berths, and nearly 270,000 meals from 2 September 2005 to 1 March 2006. In doing so, not only did they underscore yet again a heroic response that showed the spirit of America, they provided a model for future planning to rely on Merchant Marine-crewed government-owned ships in future natural and man-made disasters.

Responding to the Next Crisis

Based on such humanitarian-response experiences, the Maritime Administration is developing plans that would use RRF and NDRF ships and their civilian crews for domestic emergencies and disaster response. The necessary legislative authorities and processes are already in place for the use of these assets in peacetime crisis response and the transport of non-DoD cargos. MARAD will provide a RO/RO ship — the predominant RRF ship type — to meet emergency and disaster-response requirements with little impact on the ship. In essence floating, self-propelled, multi-level parking garages with interior and exterior ramps that allow wheeled vehicles to be loaded from and disembarked to a pier, the RO/ROs can be easily adapted for shelters and to provide berthing/messing/shower facilities for emergency personnel, field-grade hospitals, command and control platforms, carriage of berthing trailers, and helicopter landing capabilities.

During Hurricane Rita, emergency vehicle storage on board *Vincent* was the genesis of MARAD's companion "SafeStor" concept. SafeStor will ensure vehicles can be operated safely, for example, ventilation for vehicle exhaust and fuel requirements. The focus is on meeting the crisis needs of the U.S. Marine Transportation System for emergency marine transport, restoration of critical port services, transport and storage of equipment, debris removal and cleanup, "HAZMAT" remediation, hotel services for emergency personnel, and surplus energy generation.

MARAD is also addressing a "SafePort" concept that would use an auxiliary crane ship (T-ACS) as an offshore "port" in the event of a suspected terrorist attack using a commercial vessel. The six T-ACS ships in the RRF are the only specially configured ships designed for offshore offload operations of containers and heavy outsized equipment. In the event that a containership is suspected of transporting a dangerous cargo bound for a U.S. port, the Coast Guard can detain the ship and order it to a T-ACS vessel maintained in a high ready response status at a port on the Atlantic, Gulf, and Pacific coasts. The "SafePort" vessels would have the specialized equipment and trained U.S. crews to offload containers with questionable or contaminated cargo at pre-designated anchorages, safely far away from major population centers. MARAD successfully demonstrated the concept in June 2005 in San Francisco harbor, a harbinger of more development in this important area.

ENSURING CRITICAL CAPABILITIES

Many challenges confront the United States today. Among them, strategists and planners throughout the U.S. maritime industry and government are focusing their energies on the need for sufficient numbers of ships, the skilled and motivated people to operate and maintain them, and a robust and secure intermodal MTS to meet the nation's peacetime, crisis, and wartime needs. For example, various cargo-preference programs — such as the Military Cargo Preference Act of 1904, the Cargo Preference Act of 1954, and the Food Security Act of 1985, which reserve significant percentages of defense, humanitarian food assistance, and other governmental cargoes for U.S. flag vessels —provide economic incentives to retain vessels under U.S. registry for emergency requirements. And, several other programs put in place since the 1990-1991 Persian Gulf War will help to ensure critical capabilities are available, when and where needed.

Enhancing Marine Transportation Security

Under the Maritime Security Program (MSP), the federal government provides financial assistance to operators of U.S. flag vessels to offset partially the higher costs of operating under the U.S. flag. In exchange for their assistance, vessels approved for the MSP are required to be available to support defense operations during time of war or national emergency.

Signed into law in October 1996, the Maritime Security Act (MSA) replaced the operating-differential subsidy (ODS) program authorized by the Merchant Marine Act of 1936 with the MSP. The ODS program sought to equalize the disparity in operating costs between U.S. flag ships and foreign competitors with respect to wages, insurance, maintenance, and repairs. ODS payments to vessel operators were based on the differences between the costs of operating a foreign-flag and a U.S. flag ship. Under the ODS program, from 1986 through 1995 the average subsidy was $223 million per year. The MSA the 1996 Act authorized $100 million annually through fiscal year 2005 to support the operation of up to 47 U.S. flag vessels engaged in U.S. foreign trade; payments to participating operators were set at a flat $2.1 million per ship per year. MSP thus reduced by more than 50 percent — from a $225 million annual payment under the old ODS program — the federal operating assistance payments for militarily useful U.S. flag ships.

The Maritime Security Act also did away with concept of Essential Oceanborne Foreign Trade Routes as being too inflexible to respond to the dynamics of the modern marketplace and satisfy military sealift requirements. Under the MSP, ships operate in their existing and projected trades, worldwide, and can also take advantage of opportunities to carry additional cargoes to maximize the efficient use of ship capacity. In short, the MSA has allowed economics to drive peacetime shipping decisions by MSA operators.

On 24 November 2003, the President signed the National Defense Authorization Act for Fiscal Year 2004, which included a ten-year $1.734 billion reauthorization of the Maritime Security Program. The schedule of annual payments laid out in the reauthorization for payments to the contractor for each vessel that is covered by the operating agreement is:

- $2.6 million per ship and per year for Fiscal Years 2006-2008
- $2.9 million per ship and per year for Fiscal Years 2009-2011
- $3.1 million per ship and per year for Fiscal Years 2012-2015

The Congress also expanded the MSP fleet from 47 ships to 60, and in January 2005 MARAD approved MSP operating agreements for 12 companies and 60 ships (47 of which had previously had been enrolled in the MSP). The MSP fleet in early 2007 comprised:

- 40 containerships
- 14 RO/ROs
- 2 heavy lift ships
- 1 LASH vessel
- 3 product tankers

An important longer-term benefit, the MSP also helps retain a labor base of skilled and motivated American mariners to crew the government-owned strategic sealift and commercial fleets, a critical national security imperative in the uncertain future ahead.

Volunteering Intermodal Capacity

In January 1997, the Secretary of Defense approved the Voluntary Intermodal Sealift Agreement (VISA) as an Emergency Preparedness Program (EPP) under the Defense Production Act of 1950. MARAD and DoD conceived VISA to provide commercial sealift and intermodal shipping services — ships, crews, and shore-based transportation infrastructure, including planners, logisticians, managers, port facilities, and more — to satisfy national defense needs. The lessons learned during Operations Desert Shield/Storm were the catalyst for this innovative program. The agreement enables the Defense Department, through the U.S. Transportation Command, to use ships and the entire U.S. intermodal system at preagreed rates to augment organic military sealift capabilities. And, VISA commitments allow industry and Defense to plan how best to employ available capacity during an emergency. In return, all VISA participants receive a priority in the award of DoD peacetime cargo contracts. In this way, the companies and their assets at home and overseas become integral parts of the military's contingency planning and analysis.

Modeled on the DoD Civil Reserve Air Fleet (CRAF) program that integrates civilian aircraft into the Defense Transportation System, VISA can be implemented in three stages, with the final Stage III to be implemented only during times of gravest national crisis. The VISA agreement integrates commercial shipping capacity coming from three sources:

- All vessels enrolled in the companion Maritime Security Program and other elements of the intermodal MTS

- Ocean carriers transporting military cargo under DoD peacetime contracts
- Other vessels volunteered by shipping companies for sealift contingencies

In addition to the MSP participants, other commercial U.S.-flag operators can volunteer capacity in VISA Stages I and II, but in Stage III participants must commit at least 50 percent of their capacities for non-MSP vessels and 100 percent of their capacities for MSP-enrolled ships. All major U.S. flag carriers participate in the VISA, and 90 percent of the U.S. flag dry cargo fleet is enrolled — 118 ships in early 2007— providing militarily useful RO/RO and container ships. In addition, 207 ocean-going tugs and barges and other vessels were committed to the VISA program. MSP companies in 2006 made available approximately 118,000 TEUs, more than two million square feet of military useful capacity.

A valuable VISA mechanism is the Joint Planning Advisory Group (JPAG). This provides all VISA participants — industry, MARAD, USTRANSCOM, MSC, the Surface Deployment and Distribution Command, and other DoD transportation agencies — a secure forum to analyze, identify, and develop processes to satisfy defense sealift and commercial intermodal requirements during an emergency or war. A JPAG meeting can be convened by MARAD or TRANSCOM at any time, as was the case in the planning for Operation Iraqi Freedom.

In the run-up to "regime change" combat operations in Iraq, in December 2002 TRANSCOM convened a JPAG meeting to provide briefings on sealift requirements, force-protection issues, mariner requirements, and other concerns to ensure that both military and economic-commercial needs would be met. As planners ran through various scenarios, industry operators started to modify shipping movements to accommodate DoD needs without disturbing baseline commercial operations. Importantly, several U.S. operators had been conducting commercial shipping business in the Middle East and Southwest Asia for decades, some since the 1920s. This expertise, intimate knowledge of the regional environments, and well-established commercial relationships and channels with in-theater governmental agencies and private organizations proved to be a vital adjunct to the U.S. government's efforts. The JPAG process for OIF was instrumental in pre-conflict planning for the material support of coalition operations and for transporting commercial and military cargoes simultaneously, thus satisfying both economic-commercial and combat objectives.

And it was successful: through 2006, 79 VISA ships, including 59 MSP vessels, transported cargoes for combat operations, and the rebuilding of Iraq — all without the need to activate any of VISA's stages.

In short, MSP and VISA comprise a close and effective partnership between the U.S. government and America's MTS industry for strategic

and operational planning, organizing, and operating a fleet of commercial vessels and critical shoreside infrastructure to support governmental needs during national emergencies, with very little if any substantive disruption to peacetime commercial operations.

Reaching Out to Mariners

All of the U.S. government's national security plans, programs, and operations that rely on the rapid and effective movement of critical cargoes by ship rest on a single assumption: that highly skilled and committed men and women will be available when and where needed. The primary source of mariners that crew the government's ships is the pool of U.S. citizen mariners sailing in the commercial U.S. flag shipping industry. The availability, commitment, and skills of this mariner pool is directly linked to the health and size of the U.S. flag fleet. In an August 2004 report to Congress, "Merchant Mariner Training to Meet Sealift Requirements," MARAD outlined important efforts to ensure that the assumption would not be violated:

- Government-industry collaborative initiatives continually re-assess the peacetime/wartime manpower requirements, identify qualified mariners in all critical skill areas, and re-evaluate strengths, weaknesses, and gaps
- Promulgation of a memorandum of understanding between the Department of the Navy and MARAD for the mobilization of to active duty of U.S. Navy Reserve Merchant Marine Reserve (MMR) and their assignment to unfilled RRF licensed billets during a national emergency
- Establishment of a U.S. Coast Guard-approved training plan to qualify conditionally mariners who lack sufficient U.S. and international qualifications

A valuable component of these efforts is MARAD's Mariner Outreach System (MOS) that is providing a systematic means to monitor the U.S. merchant mariner pool and, of critical importance to rapid response to needs, to track and maintain contact information and the qualifications of individual mariners. A secure web-based system — https://mos.MARAD.dot.gov — launched on 1 June 2006, the MOS enables mariners who have agreed to participate to review and update their current USCG qualifications and sea service records and provide more detailed contact information.

Although participation in the MOS in no way obligates a mariner to sail, it does provide vital information about the labor pool and individual mariner's willingness and ability to crew MSC or RRF ships. And, it is an important means for MARAD to "reach out and touch" men and women who will make the difference between mission success and failure in future crises and contingencies. Should normal crewing practices prove inadequate, the system could be used to assist those in need of mariners.

Training and Education

Skilled, motivated, and dedicated merchant mariners are indeed key to all this. Proper training and education at industry trade schools, the six state maritime schools (California, Maine, Massachusetts, Michigan, New York, and Texas), and the U.S. Merchant Marine Academy are the sine qua non for sustaining this critical pool of merchant marine labor — shipboard crews and people engaged in shoreside planning, management, and operations. The contributions of these schools and academies to America's 21st-Century marine transportation system include:

- Education and development of highly skilled, competent, energetic, and motivated people
- Research into shipboard human-system integration concerns, logistical support, business management, and ship/shore operations
- Research and development of shipboard and shoreside technologies, systems, and platforms, e.g., "smart" bridge management systems

Graduates of the U.S. Merchant Marine Academy at Kings Point, NY — one of the five U.S. service/military academies — all earn bachelor's degrees and are U.S. Coast Guard Unlimited Licensed deck or engineering officers. They can apply for and accept an appointment as a commissioned officer for at least six years in the U.S. Navy Reserve or any other reserve component of a U.S. armed service. Approximately 25 percent of Kings Point graduates each year commit to active duty — including with the U.S. Marine Corps and Air Force — while others join the National Ocean and Atmospheric Administration's (NOAA) Uniformed Corps or find employment in the merchant marine industry. In addition to their reserve commitments and the requirement to maintain their USCG officers' licenses for at least six years, graduates commit to five-year employment obligations and annually report to MARAD the fulfillment of their commitments until completed.

Graduates of the state maritime schools unlimited license program also earn bachelor's degrees and USCG licenses. These graduates contribute to the pool of qualified merchant mariners; however, they often do not have military service obligations. The state maritime school graduates who participate in the federally sponsored Student Incentive Payment (SIP) Program receive financial assistance in exchange for a post-graduate obligation similar to their Kings Point cohorts: SIP graduates must remain employed in the maritime industry for three years, accept a six-year appointment and obligation in a reserve component of one of the U.S. armed services, maintain their USCG Unlimited License for at least six years, and each year report to MARAD concerning fulfillment of their commitments.

Kings Point has also had leadership responsibility for fulfillment of Section 109 of the Maritime Transportation Security Act of 2002,

which required the development of national standards and curricula for training and certifying maritime security professionals. The Academy has developed seven model maritime security training courses, three of which were written jointly with the government of India for the International Maritime Organization, as the benchmarks for worldwide maritime transportation security training programs. As well, the six U.S. state maritime academies are working closely with Kings Point to incorporate these standards and courseware into their own programs.

Likewise, industry and maritime-union schools are critical for entry-level training and advanced courses in all technical, engineering, and operational areas, as well as recertification programs for unlicensed and licensed personnel in deep-sea, coastal, and inland waterways operations. Many also carry out focused research and development into a broad spectrum of technical, engineering, operational, and policy matters.

The U.S., state, and industry-supported schools thus are critical incubators for the skilled men and women who will continue to manage, operate, and maintain the vessels and shoreside systems so necessary for the security of the nation.

CHARTING THE COURSE AHEAD

The United States is a great naval and maritime power. America's sea services — our Navy, Marine Corps, and Coast Guard — are without peer, anywhere, and are vital for ensuring peace, stability, and security throughout the globe.

But the underlying structure of our maritime strength, the U.S. Merchant Marine, rests on an uncertain keel. At the end of World War II, the U.S. Merchant Marine was without doubt the strongest in the world. Its decline since then — in ships and seagoing personnel — has been inexorable, even as the United States grew into the largest trading nation in the world and boasts a marine transportation system second to none.

America's Merchant Marine is the "heart" of the integrated and intermodal U.S. MTS that propels global trade and sustains economies world wide. In times of peace, the Merchant Marine helps ensure our economic security by keeping our essential seaborne commerce safe from those who would do us harm. In times of war, the Merchant Marine is the "steel bridge" of ships and mariners supporting our men and women overseas, carrying critical supplies, equipment, ammunition, and more.

A strong American-flag merchant fleet manned by U.S. crews — for peacetime commerce, humanitarian response, and support to our military forces in crisis and war — is an essential lifeline of the nation in the 21st Century. In this there can be no doubt.

SOURCES

Department of Homeland Security. "Protecting America's Ports: Maritime Security Act of 2002." 1 July 2003.

Maritime Administration. Annual Reports to Congress, 2001-2005.

Maritime Administration. Industry Survey Series: Great Lakes Operators, 2005. 2006.

Maritime Administration. U.S. Domestic Ocean Trades, 2004. January 2006.

Maritime Administration. U.S. Flag Oceangoing Fleet, 2006. April 2006.

Maritime Administration. Briefings, fact sheets, and press releases, September 2001-November 2006.

Martime Administration. Vessel Calls at U.S. & World Ports, 2005. 2006.

Military Sealift Command. Annual Reports, 2001-2006.

Military Sealift Command. Sealift (monthly newsletter). October 2001-December 2006.

Military Sealift Command. The MSC Strategic Plan 2006-2011: Innovation and Responsiveness for the Future. March 2006.

Military Sealift Command. Briefings, fact sheets, and press releases, September 2001-December 2006.

United Nations Conference on Trade and Development. Review of Maritime Transport, 2006. 2006.

U.S. Army Corps of Engineers. "U.S. Foreign Waterborne Transportation Statistics," 1 June 2006.

U.S. Merchant Marine Academy, Maritime Administration. Maritime Transportation Security Act of 2002: Section 109 Implementation. Report to Congress. May 2003.

U.S. Navy, Strategic Sealift Program Office (N42). Briefings and fact sheets, 2006.

U.S. Transportation Command. Annual Command Reports, 2001-2006.

U.S. Transportation Command. Briefings, fact sheets, and press releases, September 2001-November 2006.

In addition, interviews were carried out with individuals in the U.S. commercial Merchant Marine industry, the U.S. Government, and the merchant marine academies and schools.