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Special Issue on Coast Guard participation in Desert Shield/Desert Storm

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Proceedings
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Special issue on Coast Guard participation in Desert Shield/Desert Sto

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Coast Guard Cutter Key Largo escorts U.S. Naval Ship Algol out of Savannah loaded with equipment for the Persian Gulf.

Operation loadout

By Port Safety and Security Division Staff Members

Background

One of the most rapid military buildups in the history of our country, Operation Desert Shield, beginning in August 1990, contributed significantly to the overall victory of the United States, Kuwait and its allies over Iraq. Our impressive display of military might in the Persian Gulf came about through the extraordinary efforts of military, government and civilian authorities.

Logistical obstacles in the rush to deliver troops, weapons, equipment and supplies to our armed forces in Saudi Arabia were formidable. Massive amounts of munitions and equipment were needed overseas immediately. Since most of this cargo was to be transported by ship, many United States ports were rapidly inundated with materials.

The Coast Guard played a critical role in assuring the safe movement of vessels in our ports, and in supervising the loading of crucial cargoes. This massive movement of troops and cargoes, known as Operation Loadout, presented many problems for the Coast Guard.

Challenges included the first large-scale activation of the ready reserve fleet, the adaption of port facilities to meet the needs of the Department of Defense (DoD), and the provision of adequate safety and security in port areas.

The success of Desert Shield/Desert Storm depended upon the rapid sealift of essential materials. As a matter of fact, 95 percent of all dry cargo and 99 percent of all petroleum products delivered for the operation came by sea.

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Marine safety offices

Coast Guard personnel attached to marine safety offices (MSOs) throughout our coastal ports were involved in loadout activities. Such activities included pre-stow vessel inspections and plan review, hazardous materials and cargo-loading inspections, enforcement of safety and security zones, vessel escorts and assistance to numerous DoD commands.

At the height of the operations, approximately 650 Coast Guard men and women were assigned to support loadout activities at MSOs throughout the country. They monitored the loading of nearly 1.7 million short tons of dry cargo transported by ship to the Persian Gulf.

Overall, a total of about 2.9 million short tons of dry cargo and seven million short tons of fuel were shipped by allied forces in support of Desert Shield. Although United States ships carried more than 80 percent of this cargo, 38 different countries and more than 400 ships participated in the effort.

A total of 334 ships outloaded from our ports with no significant accidents. This was accomplished by MSOs, which continued to meet their regular marine safety and environmental protection responsibilities at the same time.

Port security

Port security, a critical link in the national defense chain of events, is a vital concern of any mobilization and deployment mission. Heightened global tensions can generate an increase in subversive and illegal activities.

With the advent of Desert Shield, United States ports were more vulnerable to internal threats of sabotage and theft, particularly with the staging of billions of dollars worth of equipment and ammunition. There were threats of sabotage and civil disorder, however, there were no organized attempts to compromise or destroy our rapid sealift capabilities.

Coast guardsman checks security in port staging area.

The Coast Guard responded to significant amounts of intelligence provided, especially regarding the ports of Norfolk, Virginia; Wilmington, North Carolina; Charleston, South Carolina; and San Francisco and Concord, California. There were some reports of civil disobedience, and threats of acts of terrorism, which, luckily, did not occur.

The Coast Guard coordinated their assessments of threats and surveillance of facilities involved in loadout activities with local law enforcement, Federal Bureau of Investigation and DoD counter-intelligence authorities.

Coast Guard district offices and MSOs responded to increased security threats in many ways. One was to ensure that Military Sealift Command-chartered foreign flag vessels adhered strictly to all vessel entry and crew make-up restrictions placed upon vessels and crews of countries not friendly to the United States.

Coast Guard personnel observe loading of M-1 tanks aboard a Navy ship during Operation Loadout.

The Coast Guard worked with federal, state and local authorities to ensure that United States ports did not become bottlenecks because of civil disobedience or terrorism. The Captains of the Ports (COTPs) helped protect vessels and waterfront facilities, although the owners, operators, masters and agents were primarily responsible for their own security.

COTP personnel conducted foot and vehicular patrols, manned guard posts and provided waterside security for vessels involved in Desert Shield. In some ports, they provided physical shoreside security for DoD personnel and equipment, until members of the Army Terminal Transportation Unit or the military police arrived to take over. In other ports, they assisted Navy security forces in protecting Navy assets.

Working under a vast array of laws and regulations, the COTPs maintained broad authority to provide waterside security and to monitor the activities of those responsible for shoreside security.

Port safety

COTP personnel were soon diverted from security issues to increased safety concerns. As DoD units conducted more and more physical security activities, the Coast Guard was able to concentrate more efforts toward port safety.

The primary port safety function was to monitor military and commercial cargoes for compliance with safety rules and regulations to ensure their safe transit overseas. Shipments of munitions and hazardous materials, in particular, were inspected to ensure safe and proper stowage, segregation, hazard communication and adherence to specific vessel requirements.

DoD's desire to deliver combat-ready vehicles and equipment often posed problems for planners and loading personnel, port officials and Coast Guard safety inspectors. Vehicles and combat equipment were delivered to port loading areas fully loaded with fuel and munitions, which violates explosive loading and hazardous material regulations.

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Marine Safety Office Loadout operations

DISTRICT	ACTIVE DUTY	RESERVES	CUTTERS	BOATS
1st	11	10	2	2
5th	30	99	2	4
7th	50	64	1	4
8th	39	109	1	9
11th	38	45	1	3
13th	31	28	1	3
14th	8	---	--	--
TOTALS:	207	355	8	25

The above represents the largest manpower and resource numbers at any one time dedicated to Desert Shield loadout operations, not including cutter and boat crews, marine inspector or administrative personnel. (Figures are approximate.)

Coast Guard team patrols port security zone during Operation Loadout.

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For example, once when the Military Sealift Command planned to load a shipment of 63-ton tanks, it was discovered that they weighed 72 tons. Military commanders, fearing delays and shortages ahead, had filled the tanks with ammunition as a precaution.

The majority of such discrepancies were detected at staging areas and were corrected on the spot.

Restrictions waived

Due to national emergency interests, many restrictive provisions of 49 CFR concerning the application of hazardous materials regulations to loading operations were waived. Specifically, Department of Transportation exemption 3498, which applies only to military movements during a national emergency, allowed COTPs to waive certain impractical loading requirements.

Even though many loading restrictions were removed, COTP personnel continued to conduct pre-stow inspections and reviews prior to loading operations. They also checked cargoes en route from staging areas to vessels, and monitored, or supervised loading operations ensuring proper stowage and segregation of cargoes.

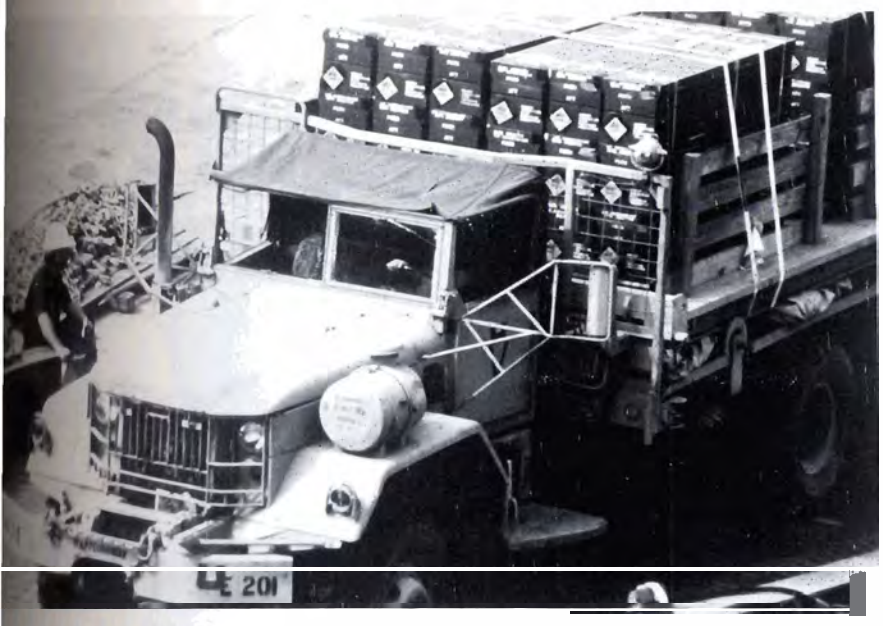
Early accomplishments

It took just 72 hours to break out and start moving the first military unit, the 24th Infantry Division from Savannah, Georgia, after the orders to deploy military prepositioned ships were given on August 7, 1990. Remarkably, the 24th infantry's weapons and tanks were transported some 8,700 miles from Georgia to the Persian Gulf in only eight days. During the first wave of Desert Shield, 110 Military Sealift Command ships moved cargo.

Waterside efforts

Coast Guard crews and vessels from various groups and stations were assigned to provide waterside security and safety. Law enforcement boardings increased and many boaters were arrested for violating emergency safety zones and escort requirements.

The control of anchorage areas, and safety and security zones* was a major waterside function of the boat patrols. The loading and bunkering of ammunition ships at berth or anchorage and providing escorts to sea, required the continuous support of stationary and roving waterside patrols.



Coast Guard marine safety officer observes loading of munitions during Operation Desert Shield.

The scope of the logistics involved can best be appreciated by the fact that at one time 69 ships were outbound from United States ports to [illegible] at the same time 21 ships were returning for reloading.

Lessons learned

The National Port Readiness Network was formed to ensure readiness to support deployment of military personnel and cargo through seaports of embarkation during national defense operations. This network set up local port readiness committees on February 1, 1985 to foster communication and cooperation between federal agencies to facilitate the necessary preparations.

These local committees proved invaluable during Desert Shield/Desert Storm. Planning, exercise development and communication on their part were greatly responsible for the success of the operations.

When the operations concluded, the National Port Readiness Network identified several issues to be addressed for future national emergencies:

- personnel access control at loadout facilities,
- roles and assignments of authorities responsible for security,
- language barriers with foreign flag vessel crews,
- sporadic threat assessments,
- adequacy and timeliness of intelligence,
- stateside shortfalls of qualified security personnel, and
- more new prepositioned and merchant ships for future deployments supporting combat operations.

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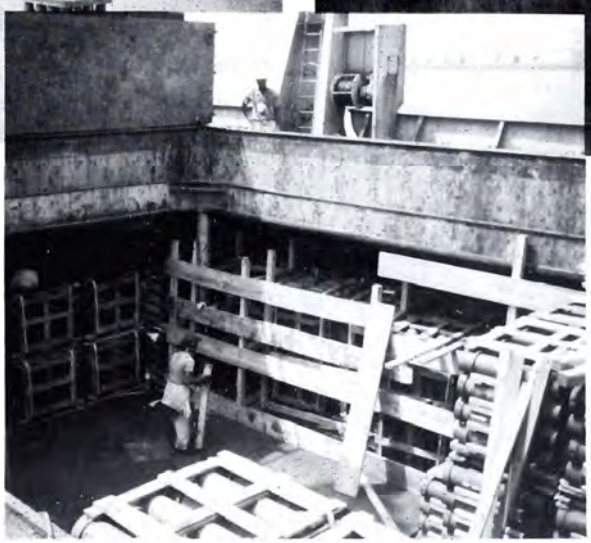
Safety Zone

A water or shore area designated by the COTP or district commander in which access is limited to authorized persons, vehicles or vessels for safety or environmental reasons. Its primary purpose is to protect vessels, structures and shore areas. A safety zone may be stationary with fixed limits or a zone around a vessel in motion.

Security Zone

A designated area of land or water established by the COTP or district commander for a necessary period of time to prevent damage or injury to vessels or waterfront facilities. The primary purpose is to safeguard against injury and destruction of ports and waterfront facilities from sabotage or other subversive acts, accidents or similar actions.



(Above left) Munitions await inspection and loading at secure staging area pierside at Al Jabayl, Saudi Arabia.

(Right) Break bulk munition loads are properly blocked and braced to prevent shifting while at sea.

Photos by GM1 Wayne H. Weeks.

(Above right) Coast Guard assessment team observes explosive loading operations on M/V John Lykes off Ad Damman, Saudi Arabia.

Photo by LCDR Stephen T. Ciccalone.

Operation Desert Sortie

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Desert Sortie

In March 1991, the commander in chief of the United States Transportation Command finalized plans for ammunition retrograde activities, dubbed "Operation Desert Sortie." After military actions ceased in the Persian Gulf, the arduous task lay ahead of returning munitions and equipment to the United States. Furthermore, since the national emergency was over, the provisions of exemption 3498 no longer applied and all waived requirements were back in place.

In June and again in September 1991, Coast Guard assessment teams of individuals with expertise in explosive loading and hazardous materials were deployed to Saudi Arabia to evaluate the safety of the retrograde operations and oversee vessel loading operations at overseas embarkation ports.

The Coast Guard continues to work closely with DoD commands to promote the safe return of munitions and hazardous materials from Saudi Arabia. The ongoing retrograde operation involves about 250,000 short tons of munitions and will require up to 40 more sealifts.

Coast Guard involvement in the Persian Gulf is projected to continue well into 1992, as long as ships with munitions and equipment from Saudi Arabia offload in United States ports.

All photos accompanying this article (except on this page) are by PA1 Chuck Kalnbach.

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Maritime Administration

plays vital role in sealift

Equality State (T-ACS 8) was one of 78 ready reserve force vessels which took part in Operations Desert Shield/Desert Storm.

By Dr. Robert E. Martinez, Deputy Maritime Administrator

Background

Operation Desert Shield/Desert Storm was the largest, most concentrated military lift operation since World War II. More was lifted in the first three weeks of the Persian Gulf operation than in the first three months of Korea, which was also a military emergency.

The vulnerability of airlifted troops in Saudi Arabia necessitated the rapid massive delivery of equipment and supplies. In total, almost four million short tons of dry cargo was delivered and more than six million tons of petroleum.

Establishing a "beachhead" through an immediate, relatively small, but critical mass of troops and equipment via air makes a strong political statement. In terms of lift capacity, however, nothing can match sealift. The first fast sealift ship to arrive in the Middle East delivered more than 15,000 tons of cargo. A single C-5 transport plane would have had to make well over 200 trips to match that level of carriage capacity.

Ninety-five percent of the total cargo which supported the allied forces in the Middle East went by sea. That proportion of overall sealift is consistent with historical patterns, and can be expected to hold true in any contingency in the foreseeable future. Very significantly, more than 80 percent of the sealift cargo required for Desert Storm was carried on United States flag ships.

The coalition victory reconfirmed the importance of the American merchant marine in maintaining an adequate reliable sealift lifeline to support deployed forces.

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MARAD focus

The Maritime Administration's (MARAD's) principal focus in the Middle East operations was the activation of 78 of the 96 ready reserve force ships. However, we also played a major role in providing war risk insurance to nearly 400 vessels and in interacting with commercial operators.

The Military Sealift Command is responsible for obtaining sealift resources and directing the operation of ships in moving equipment and supplies for the armed forces. From the beginning of Desert Shield, MARAD maintained close contact with the Military Sealift Command, as well as with several other components of DoD, the Coast Guard and numerous civilian sectors. The operations reinforced the strong ties between the civilian commercial transportation industry and America's military establishment.

Sealift

To obtain sealift, there are several ways the United States government can gain access to the commercial fleet: through commercial operations in the market, activation of the Sealift Readiness Program or requisitioning. As it turned out, the response of the commercial operators was sufficient, and it was not necessary to resort to the call-up of ships under the Sealift Readiness Program or the more draconian action of requisitioning.

If one were to take a snapshot of all the dry cargo lifted to the Persian Gulf by March 10, the profile would look as follows. The first ships to arrive in Saudi Arabia, the 13 maritime prepositioned ships, ended up delivering 4.7 percent of all the dry cargo.

These 13 vessels were deployed in three independent squadrons , each carrying the necessary equipment and 30 days of supplies for a Marine expeditionary brigade. Hence, airlifted troops marry-up with their sealifted combat equipment. The first sealift squadron arrived in Saudi Arabia on August 15, from relatively nearby Diego Garcia, an Indian Ocean island.

Another group of 12 vessels, afloat prepositioned ships, provided ordnance, supplies and fuel for the Army and Air Force. They also carried a field hospital. In total, these ships lifted 3.4 percent of all the dry cargo.

Both groups of prepositioned ships are privately owned, United States-flag vessels under long-term charter to the Military Sealift Command. Successful performance of these ships vindicated the concept of maritime prepositioning.

Military equipment transported by MARAD's ready reserve force to the Port of Damman

Helicopters were among the heavy equipment sealifted to Damman to support allied troops in Operation Desert Storm.

Fast sealift ships -- the former SL-7s -- are maintained by the Military Sealift Command on a four-day readiness status. Seven of these ships delivered more than nine percent of all the dry cargo.

In addition, mostly short-term United States-flag commercial charters delivered 14.3 percent and foreign-flag charters lifted 19.4 percent of all dry cargo.

The ready reserve force, maintained by MARAD on a five-, ten- and 20-day readiness status, lifted slightly more than 20 percent of all dry cargo, including a third of the unit equipment.

Sealift agreement

Under another option, the Military Sealift Command entered into an agreement with seven United States-flag ocean carriers called "the Special Middle East Sealift Agreement." Under this agreement, arrangements were made by the carriers to move up to 2,700 boxes per week, as a modification to their commercial service.

By mid-March, nearly 29 percent of all the dry cargo delivered to the Persian Gulf region had gone under the Special Middle East Sealift Agreement. In contrast to earlier "surge" period cargo, deliveries of "sustainment-type" cargo is precisely how commercial carriers can become sealift protagonists. This was the role the agreement was meant to address, and the carriers responded superbly.

Had the actual conflict been of a long duration, this sustainment lift would have grown proportionately.

Foreign charters

There is a good deal of discussion about the role of foreign charters. In this instance, the United States was fortunate to have ready access to foreign lift capability. By the time the ground campaign began on February 23, more than 160 foreign-flag vessels had been chartered. But, in contrast to most of the United States-flag charters, many of the foreign charters were for few voyages, many of them single voyages. In addition, the average size of foreign vessels was somewhat smaller than the United States ships.

Hence, less than 20 percent of the dry cargo went by foreign-flag, although there were many foreign ships participating. Nonetheless, the availability of foreign-flag vessels to meet United States lift requirements in future crises is an issue. It will be discussed at DoD and the Department of Transportation.

As far as planning for future contingencies is concerned, the issue is closely related to the continued decline in the active, oceangoing United States-flag commercial fleet. Had foreign charters not been as widely available, other options, such as the Sealift Readiness Program or outright requisitioning of United States vessels could have been taken.

Either choice would have severely disrupted United States-flag commercial trades, because operators would have had to pull ships out of their normal trades and face major long-term business losses. Fortunately, enough tonnage was available on the commercial market to make these options unnecessary. Notably, in this regard, our nation was not fully mobilized.

Success factors

Despite its massive logistics nature, Desert Shield/Desert Storm **did not** represent a worst case scenario. We must learn from our experiences, but avoid planning for all future contingencies based only on this most recent operation. Many favorable factors contributed to the success of the sealift:

- The coalition forces controlled the air and shipping lanes.
- The United States had near-unanimous support overseas for what was a relatively popular effort, which meant that foreign-flag ships and crews were readily available.

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We had six months to build up the inventory of equipment and supplies needed to launch offensive operations.

Access to modern port facilities in the Persian gulf expedited the offloading of cargo, and we had no battle damage to either ports or attrition of shipping at sea.

- We had shipyards with large drydocks available in theater.
- Ample supples of ship fuel were available in the Gulf.
- More parochially, for MARAD, the phased activation of ready reserve force vessels mitigated difficulties in repairing vessels and obtaining crews.

Reserve force activation

MARAD began activating ships from the ready reserve force on August 10, 1990, eight days after Iraq invaded Kuwait. Although individual or pairs of ships had been activated for special missions and test exercises in the past, this was the first multiple activation of the reserve force in "real time" since it was established in 1976.

There were problems in activating the ready reserve force. It is clear that shipyard limitations and crew shortages would have caused more substantial problems, if all 96 ready reserve vessels were required to be activated all at once.

Once tendered, the ready reserve force ships achieved a very high 93 percent reliability level and, more importantly, all the components of the sealift accomplished their mission.

It would be simple to declare that the sealift was a success and return to business-as-usual. But we must learn from this experience, identify shortcomings and develop corrective measures to improve our performance.

As far as the ready reserve force is concerned, MARAD, with broad DoD support, is focusing on modifications to improve readiness in the areas of ship material conditions, contractual issues and manning.

Deferred maintenance

MARAD faced activation delays from the beginning of the operation, because some ships suffered from deferred maintenance due to funding shortfalls.

In FY 1990, MARAD requested $239 million, but Congress appropriated only $89 million. Hence, no funds were available for test activations and some maintenance had to be deferred.

Cape Ann is moored at the Port of Damman after discharging military cargo.

In fact, only 21 of the 78 ships activated for Persian Gulf operations had ever been test activated since entering the fleet. Some ships had not run in 14 years. Some ships could not be activated on time, because they were laid up far from activation facilities. In addition, because vessels had been kept in "cold iron," activation required intensive shipyard work -- about 1,100 man-days per ship -- before sea trial.

Some activation delays also resulted from crewing problems.

ready reserve force alone, Desert Shield created about 3,000 jobs virtually overnight. To call this a "surge in demand" grossly understates the dynamics of the labor market, which today probably has fewer than 11,000 oceangoing-billets left. Desert Shield truly strained this market severely, given the compressed time requirements and the time of year.

Desert Shield demonstrated the absolute necessity of addressing the serious shortfalls in seagoing personnel which our country will face in the very near future. MARAD has long been

The ready reserve force breakbulk vessel Cape Cod transported oversized and oddly-shaped equipment and materials for use in the Persian Gulf operations.

Crewing

MARAD received outstanding cooperation from the seafaring unions in crewing its ships. Most ready reserve ships were crewed relatively quickly, in four or five days. Some vessels, however, experienced a slow response rate for some shipboard jobs. When senior engineering jobs remained unfilled for a time, other key activation actions were delayed.

Stepping aboard a vessel which has been in "cold storage," means starting from step one. Crew members have no one to ask how the ship had been running or where the problems are. They have to learn the problems first hand and correct them as they go along.

Keeping the ready reserve force in "cold storage" creates zero seafaring jobs on a day-to-day basis. Only when a ship is activated are any seagoing jobs created. Accounting for the concerned about the negative effects on emergency vessel manning resulting from the long downward spiral of shipboard employment opportunities.

Soon there may be an insufficient number of trained officers and seamen working in the oceangoing United States-flag fleet to crew the ready reserve force in an emergency. Expanding the base of jobs in the active fleet is unquestionably the preferred solution. But even a reinvigorated merchant fleet is unlikely to result in more shipboard jobs, given the larger ships and smaller crews that have become the norm.

Many former mariners who wanted to assist in crewing ready reserve ships were deterred from leaving their shoreside jobs, because of their lack of reemployment rights.

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accorded to military reservists. To correct this problem, the (Bush) administration included a provision in its proposed "Uniformed Services Employment Services Act" to provide reemployment rights for merchant mariners who respond to a request by the secretary of Transportation to crew ships in a national emergency. Enactment would greatly enhance our ability to obtain additional civilian manpower for the Merchant Marine to meet national requirements.

In addition, MARAD is working with DoD to evaluate future requirements for emergency personnel, and will pursue developing a manpower reserve program tailored to the ready reserve force.

Readiness improvements

Full Congressional funding of MARAD's current budget request will permit a long-planned fleet expansion and several readiness improvements previously curtailed by budgetary limitations.

Every ship in the ready reserve fleet on five-day readiness should be test activated with a full-power sea trial every other year. One simply cannot guarantee the readiness of a ship laid up in "cold storage," unless it is taken out to sea periodically.

MARAD is also looking at some partial peacetime crewing of high-priority ready reserve force vessels. A few vessels would be maintained in a manner similar to the Military Sealift Command's fast sealift ships. Also, there would be more outporting of vessels near loadout ports or activation facilities.

Contracting is an essential part of ready reserve force maintenance. MARAD relies on private sector contractors to manage the day-to-day maintenance of the fleet.

In the future, each ship will have a manager, backed up by a general agent. Ship manager contracts are awarded based on technical expertise, managerial and organizational resources, and cost.

A better balance of technical expertise and cost must be struck to exclude firms without the necessary resources to manage in a crisis. Therefore, our contractor selection criteria will be revised to raise the technical and resource qualifications.

Because ships under contract to managers will be assigned mostly in pairs, small firms fully capable of managing two to four vessels will not be precluded from winning awards. Sister ships will be "nested" side-by-side for easier management.

Mobility Requirements Study

Much attention is being focused on the Mobility Requirements Study being undertaken by the joint staff for the secretary of Defense. This study will define mobility requirements, including sealift, for the remainder of the decade.

The interim response to the Mobility Requirements Study on April 22 identified a general need for more large, medium speed RO/RO (roll-on/roll-off) vessels, which were the "ships of choice" in the Gulf conflict. It is clear that DoD will assign high priority to expanding the number of RO/RO ships in the ready reserve force. There are now 17, all of which began activation at the onset of the first phase of the sealift.

There are other pressing tonnage requirements. For example, there will be a precipitous decline in the inventory of United States-flag tanker vessels by the end of the century. A lot of petroleum product was lifted in Desert Shield/Desert Storm, but it was not carried directly into the theater -- one of the unique characteristics of this operation. However, not every future contingency will occur in oil-producing regions, and we will need to provide lift.

On a related matter, MARAD hopes to assist the Coast Guard in assessing the potential impact of the Oil Pollution Act of 1990 on future vessel supply for tankers and other vessel types. We do not yet fully understand the potential impact of the liability provisions within this act, which will be far-reaching.

RO/RO ships

The vessel of choice in the Persian Gulf operations was the roll-on/roll-off (RO/RO) vanship. Tanks and trucks can be driven directly on and off.

All photos accompanying this article are by Hal G. Laws, a MARAD program specialist.

Key Questions

Important questions remain as to how sealift will be provided in the future.

- Should ships be designed for afloat prepositioning retention with partial crews in United States ports, or for use in commercial trade under build and charter or other arrangements?
- Should we develop a program similar to the Civil Reserve Air Fleet for sealift?
- Can the DoD contract cycle with commercial operators be extended in duration to provide for more business certainty?
- Can we devise an approach to allow us to call on commercial sealift for surge cargoes earlier in the game?
- What will happen to United States-flag commercial shipping available for sustainment sealift when the Operating Differential Subsidy Program and other promotional programs come to a close?
- Can we provide greater certainty for United States operators benefiting under current promotional programs in a transition between these programs and a future regime?

Lessons learned

A review of Operation Desert Shield/Desert Storm provides many lessons for future planning. From MARAD's prospective, the main underlying lesson is the confirmation that adequate sealift -- however unglamorous it may appear -- is absolutely essential to protect our nation's interests overseas.

The operation was a success, in part, because the United States still holds a significant level of maritime capability. Keeping that capability available and responsive must remain an essential objective in our planning.

Dr. Robert E. Martinez is the deputy maritime administrator of the Maritime Administration. For information, contact Mr. Walter Oates, public affairs officer, Maritime Administration.
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Loadout operations vessels and tonnage by port

PORT	VESSELS	SHORT TONS
Bayonne and Earle, NJ	35	191,944
Hampton Roads and Norfolk, VA	14	44,639
Wilmington, NC	22	127,112
Sunny Point, NC	38	365,033
Morehead City, NC	5	8,917
Charleston, SC	14	76,925
Savannah, GA	42	114,897
Jacksonville, FL	67	211,694
Gulfport, MS	1	3,398
Houston, TX	40	211,705
Beaumont, TX	18	89,044
Long Beach, CA	18	36,950
Port Hueneme, CA	12	32,979
Concord, CA	9	68,361
Oakland, CA	18	42,972
Tacoma, WA	4	11,425
Honolulu, HI	1	4,852
Puerto Rico	1	1,880
Guam	4	23,918
TOTALS:	363	1,668,654

Source: Military Sealift Command
Figures approximate as of September 1991
A total of 2,986,473 short tons of dry cargoes moved, as well as 7,000,000 short tons of fuel.

Activation activities *are intense* at MSO Hampton Roads

By LTJG David Haynes and CWO2 Brian Fisher

When Operation Desert Shield began, the Military Sealift Command asked MARAD to activate portions of the ready reserve force. By the end of February 1991, MSO Hampton Roads in Norfolk, Virginia, had participated in the activation of 21 -- more than 27 percent -- of a total of 78 vessels restored to active duty for the Gulf war. The inspection process was intense and often unconventional.

Ready reserve force

A key element of any strategic sealift, the ready reserve force is designed to transport Army and Marine Corps unit equipment and initial resupply for armed forces deploying anywhere in the world during the critical period before adequate numbers of Navy-controlled or requisitioned ships can be marshaled. This force consists of merchant-type ships, either selected from MARAD's National Defense Reserve Fleet and upgraded, transferred from the Navy, or chartered directly from United States or foreign owners. They must have a high degree of military usefulness and a significant remaining life.

On Virginia's James River, a designated lay berth port for nearly 120 military usable vessels, there are normally more than 30 vessels in ready reserve force status.

Preparations

On August 10, 1990, just eight days after Iraq invaded Kuwait, MSO Hampton Roads prepared to conduct safety and compliance inspections of the ready reserve force vessels slated for five-, ten- or 20-day activations for Operation Desert Shield. Before the vessels arrived at local shipyards, representatives from MARAD, the vessel managing companies, shipyards, the American Bureau of Shipping and the MSO discussed the urgent task ahead.

The MSO was to conduct the required vessel inspections as thoroughly and quickly as possible. Major inspection work force reallocations had to be made to achieve this.

Marine inspectors assigned to other duties were shifted to inspection work. Those with considerable experience supervised teams at each of the local activation shipyards. Inspectors on leave were recalled and others were brought in from other Coast Guard units. To ensure that routine work did not suffer, minimum crews of marine inspectors were maintained at local shipyards.

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Many vessels remained in the James River national defense reserve fleet even after 17 were activated.

Photo by LTJG Randy Farmer.

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Work begins

The first five vessels broken out of the James River fleet were in either a five- or ten-day activation status. Initially, the vessels came to life slowly as shipyard workers hooked up the necessary equipment.

Before long, with miles of cable, wire and hose running from every available hatch, porthole and, in some cases, newly cut holes, the vessels were quickly revitalized. As electricity began to flow to idle equipment, as vital fluids were pumped through miles of piping, and as numerous deteriorated components were identified, the scramble for spare and replacement parts began.

Normally, Coast Guard inspectors determine compliance with safety requirements, but do not direct the shipyard workers' activities. In this urgent situation, however, the vessel managing company representatives and MSO inspectors worked as teams in directing shipyard personnel to complete required tests and correct safety deficiencies.

As the activations continued, marine inspectors acted to ensure that pressure to deliver vessels quickly did not erode thorough evaluations of safety-related systems. Some managing companies suggested that national defense waivers be requested to allow the ready reserve force vessels to sail without meeting certain Coast Guard requirements. These waiver requests never materialized at Hampton Roads.

Deficiencies

Initially, many vessels were not in compliance with the requirements of international conventions and federal regulations that had come into effect after their acceptance in the ready reserve force and subsequent deactivation. For example, one vessel's navigati[illegible] not meet 1977 collision-prevention regulations which had applied to the vessel since 1987.

Many vessels had deficienci[illegible] marine pollution prevention requirements in effect since 1983. Normally, managers would have to submit vessel plans to the Coast Guard Marine Safety Center in Washington, D.C., for approval to comply with any new regulations. To expedite activations, plans submitted for ready reserve force ships were evaluated [illegible] permitting the required equipment to be installed, tested and verified almost immediately.

Unfamiliarity

The lack of familiarity with older vessel systems by crews and managing company personnel posed significant obstacles to rapid and safe activations. Crew members, shipyard workers and inspectors researched plans and vendor manuals to understand and test unfamiliar systems.

An example was the fixed high expansion foam firefighting system on the RO/RO *Adm. W. H. Callaghan*. This unique system employs a series of individually activated foam generators

located throughout the cargo holds. Each gen-
s fed from a proportioner located on an
upper deck. When in use, thousands of cubic feet of foam are rapidly generated, filling the affected hold. Before successfully testing this long dormant system, numerous components were reworked or remanufactured by the shipyard.

The lack of current plans on some ships complicated the testing of cargo hold fire detection equipment and carbon dioxide extinguishing systems, remote emergency equipment shutdowns and machinery automation controls.

Cannibalization

A major problem was cannibalization. One vessel arrived at a shipyard for activation minus its ---ors, windlass motor and 50 major valves. Another was missing more than half of its cargo hold ventilation fan motors.

Reflagged vessel problems

Other problems faced by marine inspectors concerned foreign-built vessels that had been reflagged before being accepted in the ready reserve force. Onboard equipment on most reflagged vessels does not meet all technical requirements of United States regulations, since the vessels were built to foreign standards.

When these vessels were reflagged, each system was evaluated on a case-by-case basis by the Coast Guard to determine whether or not they provided equivalent levels of safety. Due to changes in managing companies and a resulting lack of adequate documentation, marine inspectors had difficulty determining whether some systems had been adequately addressed at the reflag inspections.

Activated briefly in 1989, ~~Cape Mohican~~, a Seabee vessel, was nearly trouble-free and its inspection was completed in four days. Photo by LTJG Randy Farmer.

Wrong plans

Fire control plans on some vessels did not accurately reflect the installed fire and safety systems. In one case, the posted plan was so inaccurate that it had to be completely redrawn. With time at a premium, shipyard draftsmen began the challenging task of creating a new plan. To expedite the plan's review, approval and verification, a marine inspector reviewed it on the drafting table. Within three days, the new fire control plan was approved and posted on board the vessel.

Other problems

Marine inspectors faced many problems with normally reliable systems and equipment. Deteriorated sea valves had to be replaced, and bilge suction valves and piping systems had to be unclogged, replaced or repaired. Many propulsion boilers needed tube replacements and refractory repairs. Lifeboats needed hull and propulsion machinery repairs.

Deteriorated through-hull spool pieces necessitated drydocking of one vessel. Hundreds of watertight and weathertight closures needed repairs.

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The sudden demand for spare equipment emptied warehouses across the nation of essential items, from pipe expansion joints and valves to Coast Guard-approved flares and emergency drinking water for liferafts and lifeboats.

Vessel manning

During the initial wave of vessel activations, operating companies found sufficient qualified mariners to crew the ships. As more ships were activated, however, the pool of qualified merchant mariners shrank.

The master of an early activated vessel had nine crew members quit before the vessel completed its shipyard period. The commanding officer evaluated manning adequacy on a case-by-case basis and, in at least eight instances, ready reserve force vessels were permitted to sail shorthanded. However, other vessels had critical crew members sign on just hours before getting underway.

Crews on board for only a few days were visibly fatigued from extreme overtime hours preparing for sea trials. In several instances, the MSO commanding officer, acting as the officer in charge, marine inspection, supported masters in adjusting their sailing times to provide rest for their crews.

Equipment testing

Shipyard workers conducted start-ups and machinery testing during most of the activations. Marine inspectors later required that certain equipment tests and safety checks be performed by crew members, even if this meant retesting equipment.

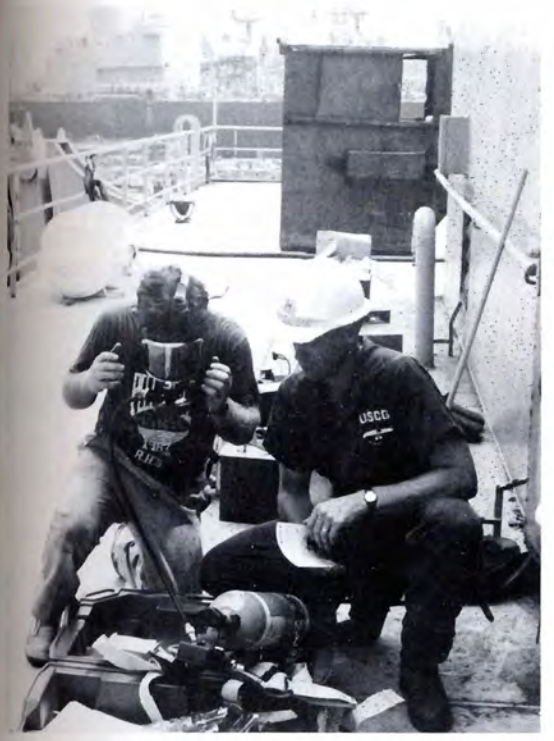
Personnel problems

Soon after vessel deployments, the managing companies and ship masters began reporting personnel problems and associated marine casualties. The officer in charge, marine inspection decided that extraordinary personnel problems might significantly reduce the mission capabilities of the vessels. He therefore established a proactive vessel visitation program to identify and overcome personnel-related problems.

When a ready reserve force ves... at or left Hampton Roads, an MSO ... officer contacted the master to review ... official log book. Where necessary, th... gating officer immediately initiated personnel investigations leading to possible action against the involved mariner's document or license.

MSO Hampton Roads investigated seven personnel and nine casualty cases that took place aboard ready reserve force vessels. Charges in the personnel cases included desertion, failing to turn to, AWOL, absent over leave, assault, misconduct, intoxication, reports o... incompetence and the use of dangerous drugs. The casualty cases dealt primarily with main propulsion plants and associated equipment.

The unique foam firefighting system and gas turbine propulsion of the RO/RO ADM. WM. M. Callaghan were new to marine inspectors.



Marine inspectors helped familiarize crews with their ships. Photo by MKC Jim Brickett.

This vessel visitation program led to Military Sealift Command's publication of personnel logging procedures for all its vessels.

Documentation

In addition to the activations, MSO Hampton Roads was deeply involved in other Desert Storm-related activities.

The documentation staff, for example, was kept busy reviewing and renewing the sudden surge of ready reserve force vessel documents.

The MSO also took care of an increase from ten to more than 30 merchant mariners applying daily for seaman's papers. More than 1,850 mariners applied for initial licenses or upgrades between August 1990 and March 1991.

Terrorist response

Because major Persian Gulf support from all the military services was originating from Hampton Roads, the local intelligence community acknowledged a high risk of terrorist activity. As the deadline for Iraq's withdrawal from Kuwait approached, the MSO dramatically increased harbor patrols and vulnerability surveys of waterfront facilities. The commanding officer, as terrorism response coordinator, drilled his staff in counter-terrorist actions.

Once a facility employee found six pipe bombs attached to a 1.5 million-gallon tank of sodium hydrosulfide and a tank of methanol, an extremely flammable liquid. At first, the incident was thought to be an act of international terrorism, but the FBI later found it was an attempted insurance fraud. A state police bomb squad removed and detonated the devices, but port tensions remained high. The commanding officer alerted the local maritime community of added security precautions to be taken.

Security oversight

When Desert Shield loadouts were announced for Newport News Marine Terminal, the MSO commanding officer established a security detachment of more than 40 Coast Guard reservists on active duty. This detachment provided safety and security oversight for 12 vessel loadouts.

Conclusion

The 21 vessels activated in Hampton Roads made 77 voyages carrying more than two million short tons of cargo in support of Operation Desert Storm and Desert Sortie.

That success story is a tribute to the people who made these vessels operational -- managers and shipyard workers, tug operators and harbor pilots, and marine inspectors and merchant mariners. These teams came together in a crisis and prevailed. Not only did they provide critical support to the successful war effort, they also gave the languishing ready reserve fleet a much needed infusion of quality maintenance.

Finally, the entire process vividly demonstrated the need to maintain a strong ship repair capability and a dependable pool of licensed mariners.

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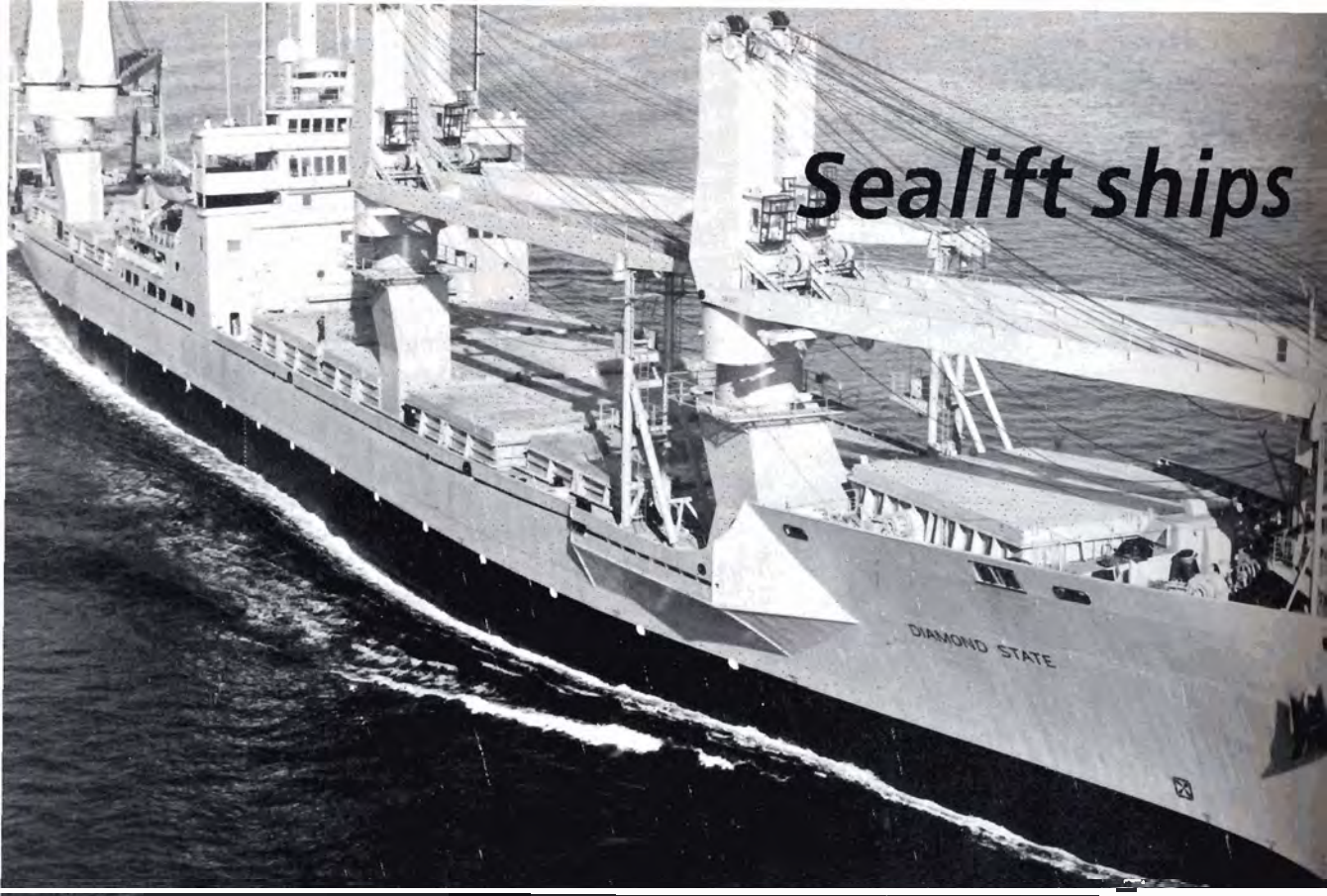

Diamond State (T-ACS 7), a MARAD auxiliary crane ship, was operated by the Military Sealift Command for Desert Shield/Desert Storm

Sealift ships inspected for safety

By LCDR Charles A. Barrett and Mr. John J. Hannon

An important Coast Guard effort during Operation Desert Shield/Desert Storm was the safety inspection and certification of United States flag merchant ships used to sealift vital equipment and supplies to the Middle East. The ships were a mixture of government cargo vessels, and privately owned and operated ships.

The government vessels were either civilian manned ships owned and operated by the Navy Military Sealift Command or ships owned by MARAD and maintained in a laid-up status as a ready reserve force for operation by the Military Sealift Command in times of crisis or national emergency. This ready reserve force is a vital part of our country's national defense transportation capability.

Coast Guard personnel assigned to the merchant vessel inspection program conduct inspections of the government-owned vessels using the commercial vessel safety regulations that apply to their privately owned counterparts.

Helping to ensure the safety of sealift ships, their crew and cargo is just one of many continuing jobs for Coast Guard marine inspectors nationwide.

Resource network

The merchant ships are an important part of a vast network of resources which can be tapped by the United States Transportation Command to provide air, sea and land transportation to meet national security objectives. Through its service components, the transportation command works continuously throughout DoD and with industry to integrate and make the most effective use of airlift, sealift and land resources from origin to destination.

The command is organized to support the geographic commanders in chief in times of conflict through three components: the Military Sealift Command, the Military Airlift Command and the Military Traffic Management Command.

The sealift command is responsible for global sealift operations. In any major, sustained overseas deployment of United States troops, sealift delivers approximately 95 percent of all dry cargo and 99 percent of all petroleum products. The airlift command deploys the vast majority of the troops, and the traffic management command musters, manifests, loads and moves troops and cargo to their stateside ports of embarkation.

Available ships

The Military Sealift Command operates two prepositioned fleets. These ships are maintained in locations near regions of the world where potential United States military actions might be required. As troops are moved rapidly by airlift, they join up with their prepositioned equipment and quickly become combat ready.

Thirteen maritime prepositioned ships are divided into three squadrons, each capable of equipping and supplying a Marine expeditionary brigade, consisting of approximately 16,500 combat Marines. Another 12 afloat prepositioned ships carry Army and Air Force equipment and supplies.

Next in response time are eight fast sealift ships, commercial container ships modified for a RO/RO capability for wheeled and tracked vehicles. These ships are maintained in United States East and Gulf Coast ports in a reduced operating status, which permits them to load and sail at short notice.

If the situation warrants, the Military Sealift Command orders MARAD to activate ready reserve force ships for duty. This force, which is maintained by MARAD, currently numbers 96 vessels: 83 dry cargo ships, 11 tankers and two troopships.

Although the vessels are in a lay-up status most of the time, they are maintained in such a manner that they can be made ready for sea on short notice. They are assigned a five-, ten- or 20-day status, which indicates the maximum number of days required to make them fully operational.

During a vessel's activation, the Coast Guard oversees all testing of equipment and systems, including boilers, generators, main propulsion, steering, lifesaving and firefighting gear. Finally, each vessel undergoes a sea trial to demonstrate satisfactory operation of all equipment and systems.

Activations

Immediately after President Bush's order on August 7, 1990, to move United States forces to Saudi Arabia, afloat prepositioned ships in the Indian Ocean, the Western Pacific and Eastern Mediterranean proceeded at flank speed to the Persian Gulf. The first ship arrived August 15.

At the same time, the Military Sealift Command activated the eight fast sealift ships to move the 24th (mechanized) Infantry Division from Savannah, Georgia, to Saudi Arabia. These ships have a combined capacity for more than 8,000 military vehicles. The *USNS Capella* quickly loaded the lead brigade of the division, arriving in the theater of operations August 27.

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Aviation logistic support ships, SS Wright (T-AVB 3) and SS Curtiss (T-AVB-4), sealifted aviation equipment and technicians to the Middle East.

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The Military Sealift Command requested priority activation of 17 ready reserve force RO/RO ships. These vessels are extremely useful, because they carry military vehicles and other equipment which is too large to fit in a typical cargo ship container.

MARAD also activated three break-bulk ships and two aviation logistics support ships carrying maintenance personnel and equipment for the Marine Corps.

Activation of ready reserve force vessels continued at a frantic pace during the first two weeks. Twenty-one vessels were prepared for service, and tendered to the Military Sealift Command for deployment to United States ports to be loaded with cargo, ammunition and equipment. Two hospital ships were also activated for duty in the Persian Gulf.

A typical activation required the around-the-clock work of two or more Coast Guard marine inspectors over a period of five to 20 days, depending on the condition of the vessel. A typical work day for an inspector on board an activating vessel was 14 to 16 hours, and often involved spending the night on board ship.

By the end of 30 days, activation had begun on 42 vessels, with 36 completed. They included 17 RO/RO ships, ten break-bulk vessels, three LASH, three Seabee ships, two seatrain vessels and a tankship. Altogether, 78 ready reserve force vessels were activated for Operation Desert Shield/Desert Storm.

Inspections

In addition to the ready reserve force activation vessels, Military Sealift Command owned and chartered vessels were inspected by the Coast Guard. Follow-up inspections of vessels in overseas and United States ports were also needed because of emergency drydockings, damage from accidents, mechanical failures and expiration of inspection certificates.

A total of 391 Coast Guard marine inspectors participated in this effort to help ensure the safety of the merchant mariners aboard the sealift vessels, and to protect the vital defense cargo.

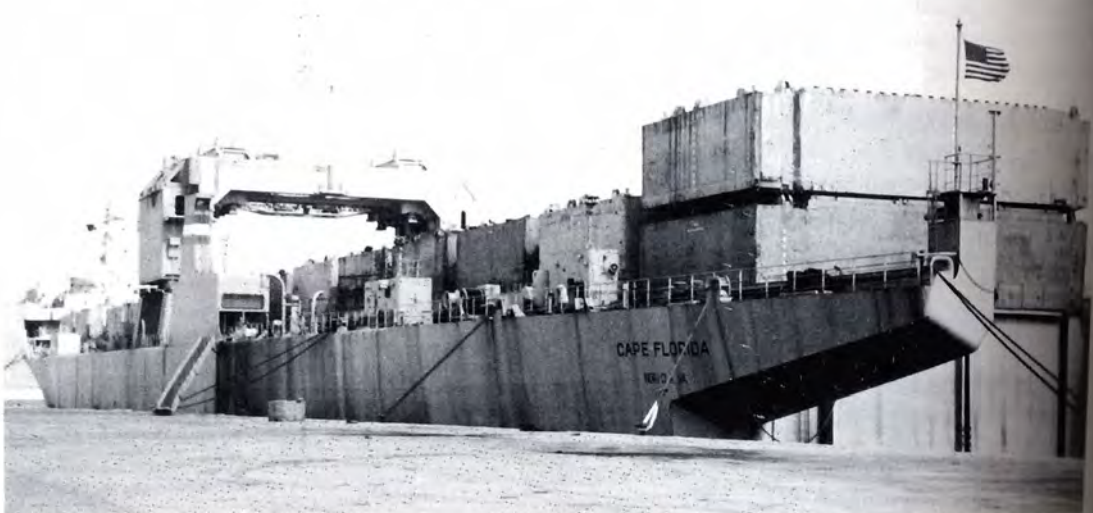
Lessons learned

As the ready reserve force returns from duty to be placed back in a deactivated status, Coast Guard marine inspectors, MARAD and Military Sealift Command personnel, and industry representatives are documenting lessons learned during Desert Shield/Desert Storm. Studies have already yielded ideas for improvements in safety and efficiency.

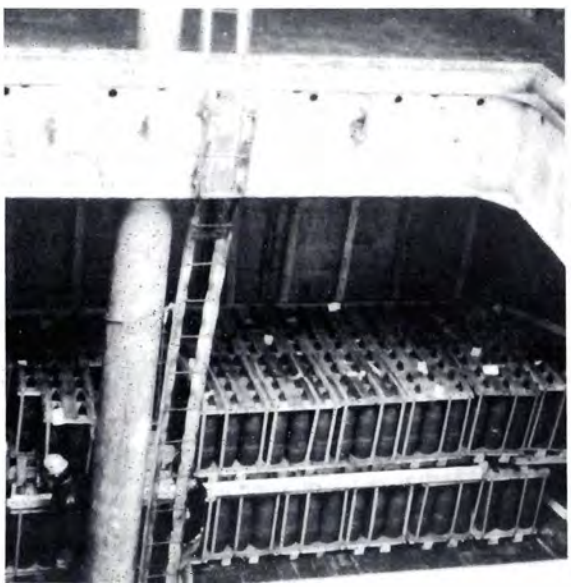
The Coast Guard is proud to have contributed to the safety aboard the sealift ships during the operations, and is eager to learn from the experience.

LCDR Charles A. Barrett and Mr. John J Hannon are assigned to the Merchant Vessel Inspection Division of the Office of Marine Safety, Security and Environmental Protection. Telephone: (202) 267-1464.

Cape Florida, a LASH (lighter-aboard-ship), delivers barges at the Port of Damman, Saudi Arabia. All photos accompanying this article are by Hal G. Laws, a MARAD program specialist.



EXPLOSIVE LOADING in New York



Hull is loaded with blocked and braced explosives bound for the Persian Gulf.

By CDR William Helgeson

Before Operation Desert Shield, the Facility Compliance Office of Group/COTP New York provided explosive loading supervising details to the Naval Weapons Station at Earle, New Jersey, for one load every two months. These loads required eight to ten hours of supervision a day for two to three weeks.

As operations intensified in the Middle East from September through December 1990, the loadouts increased to a vessel per month, requiring two ten-hour work shifts of supervision, six days a week over a period of two to three weeks.

The Coast Guard also monitored a second loadout point for equipment and limited quantities of explosives at the Military Ocean Terminal at Bayonne, New Jersey.

COTP New York maintained continuous security zones around the Earle and Bayonne facilities, which were only suspended at the latter during limited times when ships were not present.

Waterside security

Waterside security for the weapons station at Earle was routinely provided by Coast Guard floating units from Group Sandy Hook. Floating units from Group New York provided the necessary security for loading operations at the Bayonne terminal. The New York units included small boats and three 65-foot cutters: *Hawser*, *Line* and *Wire*. The cutters conducted three-day deployments controlling commercial traffic to the area, preventing all access by vessels or small boats which were not cleared.

Pace quickens

Once offensive action started in the Middle East, the pace quickened in the Port of New York. At any one time during January and February 1991, three vessels were simultaneously loading bulk explosives at the weapons station at Earle, while additional vessels were loading military equipment, such as tanks, trucks, cranes and helicopters at the Bayonne terminal.

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This left the Facility Compliance Office with only two petty officers to handle the normal work of conducting facility inspections at more than 200 sites, and monitoring commercial explosive loadouts for a three-year dredging project in the Kill Van Kull Channel.

To handle the work load, 17 reserve petty officers, were assigned to the Earle loadout operations in mid-January. After three weeks' training, they assumed most of the manning of the explosive handling supervision detail at the weapons station. The detail at Bayonne was maintained by regular Coast Guard personnel.

Reserves also served in security detachments and filled staff administration jobs.

Pace keeps up

The completion of offensive actions in the Middle East in February had little effect on the pace of loading operations at the Naval Weapons Station, since munitions were returning from the theater of operations and new munitions were sent to resupply Europe. Loading supervision continued six days a week, 20 hours a day with little let up through August 1991.

Summary

During Operation Desert Shield/Desert Storm, a total of 23,799 tons of explosives were loaded on board 21 vessels, and 250,000 long tons of military equipment was loaded on board 22 vessels in the Port of New York.

Group/COTP New York continues to provide trained explosive loading supervision details to assure the safety of the port.

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Coast Guard explosive-handling supervisors check void for water as part of a safety inspection prior to loading explosives for deployment to the Middle East.

TWO DISASTERS
that did not happen during Desert Storm

Port Chicago

Throughout World War II, munitions were loaded aboard merchant cargo vessels and Liberty ships bound for Pearl Harbor, Melbourne and the Philippines. Month after month, in various American ports, men spent hours filling these munition ships with slingloads of shells and high explosives.

One of the main sources of supply for the Pacific fleet was a naval ammunition depot at Port Chicago, a town of about 1,500 people on the Sacramento River about 30 miles northeast of the city of San Francisco. The citizens watched ship after ship come in, load up with ammunition from railroad boxcars at a long wooden pier and depart for the Pacific.

On July 17, 1944, there were two cargo ships docked at the Port Chicago pier. One, *E.A. Bryan*, had been moored for four days, taking on some 4,600 tons of ammunition and high explosives. The other, *Quinault Victory*, a brand new ship, was being rigged in preparation for loading, which was to begin at midnight.

Around 10 p.m., the pier was crowded with men, equipment and boxcars of munitions, plus more than 400 tons of bombs and projectiles to be loaded. At approximately 10:20, the two ships exploded within five seconds of each other, filling the sky with an enormous, blinding light.

Windows broke in houses 20 miles away. Twisted metal and shell fragments cascaded down, destroying the two ships and wrecking the naval base. There was not a house in Port Chicago, a mile away, which was not damaged by the explosion. Residents of San Francisco saw the fireball in the sky and felt the earth tremble.

Hardly a man,woman or child in a three mile radius escaped injury. What's worse, 321 men -- merchant seamen on the vessels and Navy enlisted men on the wharf -- lost their lives.

A Naval Court of Inquiry was convened on July 21 to look into the circumstances attending the explosion. The exact cause was not determined, but the safety of the loading practices were questioned.

With today's emphasis on safety and security, it is highly unlikely that such an event would happen.

SS Badger State

On December 14, 1969, *SS Badger State*, a 441-foot cargo vessel built in 1944, sailed from the Naval Ammunition Depot in Bangor, Washington, for Da Nang, Republic of Vietnam, with a crew of 40. It was loaded with 5,336 long tons of unfuzed aerial bombs stowed on pallets and associated crated hardware.

In the early hours of December 26, in the North Pacific Ocean, a severe unpredicted storm hit the vessel, causing it to roll heavily. Metal bands on bomb pallets in an upper 'tween deck broke and numerous 2,000-pound bombs became adrift.

With each ship roll, the bombs rolled or slid, striking each other or the ship's steel hull where the wood sheathing had been splintered away. Small holes were punched in the ship's side by the battering of the bombs. Several bombs fell into the hold below through a hatch.

SS Badger State radioed a distress call and made strenuous efforts to restrain the rolling bombs. All available nonflammable material, including mattresses, frozen meats, mooring lines and spare lifejackets were thrown in the hold to cushion the bombs.

A 2,000-pound bomb detonated, blowing off hatch pontoons, bending booms and scattering burning materials on deck. A jagged hole about 12 feet long and eight feet high was blown in the starboard side of the hull.

The master sounded the abandon ship signal and liferafts were launched, but blew away. While a lifeboat with 35 crew members was alongside the ship, a 2,000-pound bomb fell out of the starboard hole and landed in the lifeboat, which capsized, killing several men.

A merchant ship arrived about one-half hour after the explosion and rescued 14 survivors. SS Badger State sank on January 5, 1970.

The National Transportation Safety Board determined that the probable cause of this casualty was the failure of the bomb stowage and packaging system to restrain the cargo under the ship motions that occurred during the adverse weather encountered on the voyage, particularly on the morning of December 26.

Flexibility . . .

the key to success in Houston

By CDR Rex J. Prosser and LT Michael T. de Bettencourt

The success of the loadout operation by MSO Houston, Texas, during Desert Shield was largely due to flexibility. The 164 reserve and regular Coast Guard members of the MSO, plus the detachment at Barbours Cut Marine Terminal in the Port of Houston, responded immediately and positively to a myriad of rigorous demands during one of the largest movements of military cargo in the history of our country.

This operation was unique because many of the 22,300 pieces of tracked and wheeled vehicles stowed aboard vessels at the port were equipped with basic loads of ammunition. Normally, all explosives are shipped separately from the vehicles and loaded at the staging area in the theater of operations. During Desert Shield, however, the urgency of the buildup necessitated that the equipment be shipped ready to roll right into action upon arrival.

The Barbours Cut terminal was selected by the Army as a loadout facility shortly after the Iraqi invasion of Kuwait. Within a few days, the Army Military Transportation Command, the Navy Military Sealift Command and the Coast Guard COTP sent representatives to the terminal to await the arrival of the equipment.

The cargo, which came from 10 military bases in the southern and central United States, ranged from M-1 main battle tanks and H-60 Black Hawk helicopters to artillery and miscellaneous combat support items.

Due to the scope of the anticipated operation with the Coast Guard's mission to provide port security and ensure the safety of all the uploaded vehicles, the COTP immediately requested reserves.

At the height of the operation, more than 106 reservists were assigned to the MSO, along with 129 active duty personnel.

Security

Initially, the outload was viewed as a port security operation for the Coast Guard, with some emphasis on port safety. By agreement, all military equipment was to be loaded properly, with all explosives securely and safely stowed, and hazardous materials regulations followed, unless specifically exempted by agreement with DoD.

Initially, the primary emphasis was on the security of the loading terminal. To this end, 76 Coast Guard men and women were assigned to four watch sections. Each section had two boats for security zone enforcement. Shoreside units supported waterside personnel and coordinated with other security forces.

Shoreside Coast Guard personnel support vessel on security patrol.

Cri[illegible]l to security control was a tactical control offi[illegible]icer, who was responsible for the coordinati[illegible]on of security zone enforcement and he contro[illegible]reactions to security threats. The ritical im[illegible]portance of controlling enforcement of security zo[illegible]ne in an area where recreational essels, h[illegible]or tugs, shore gangs and ship's crew were pres[illegible]ent took on an added dimension when he use of [illegible]adly force was authorized. Therefore, the t[illegible]ical control officer was selected on he basis [illegible]of p[illegible]rofessional experience in law nforceme[illegible]nt and demonstrated ability to control crisis sit[illegible]tion.

[illegible]al problems had to be solved as soon as the res[illegible]erves arrived. First and foremost was eapons q[illegible]ualifications. Armory personnel orked ar[illegible]ound-the-clock to qualify all reserves n small arms proficiency. Secondary training reas incl[illegible]uded security procedures, personal defense, c[illegible]ommunications, discipline and tactics.

An initial shortage of Army military police meant that the perimeter and terminal operating areas were not adequately covered. Coast Guard personnel filled this gap until DoD resources arrived. In that the terminal was not a DoD facility, the military police were not armed. The primary armed forces were the port authority police and the Coast Guard.

Safety

Shortly after the military equipment arrived, the focus of Coast Guard efforts quickly changed from security to safety. Spot checks by Coast Guard safety personnel detected consistent problems with cargo.

Many vehicles had more ammunition aboard than the basic load, which meant that the explosives were not secured properly. Frequently, equipment was piled into a vehicle after ammunition had been loaded, which posed the problem of whether the explosives remained safely stowed. Also, some ammunition worked itself loose during transit to the port.

Another common problem was that fuel tanks were too full for shipment. A DoD waiver allowed the tanks to be three-quarters filled. Vehicles with more than this amount had to be

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Loose miscellaneous equipment stowed unsecured with Class A explosives.

Coast Guard inspector checks cargo and ammunition stowed in a Bradley fighting vehicle.

Coast Guard port safety personnel inspected lashing gear once vehicles were secured.

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defueled, because of the high probability that the fuel would expand in the hot cargo hold, and the motion of the ship would cause it to spill onto the deck. This posed an unacceptable fire hazard.

Other problems included improper markings and stowage of incompatible hazardous materials together aboard vessels. The improper stowage of flammable gases and corrosives below deck was a real concern.

To address these safety threats, Coast Guard reserves were given crash courses in dangerous cargo regulations, military equipment operations, and nomenclature, and port terminal safety.

The ultimate goal of moving cargo without delays due to safety discrepancies had to be met. This necessitated shepherding cargo from rail yard to final loading to ensure that corrections were made promptly.

An efficient system of marking cargo was developed to record the status of a vehicle's fuel tanks, stowage conditions, required corrective measures and the Coast Guard inspector's watch section. This easily understood system contributed greatly to the fluid movement of cargo through the staging areas and onto the vessels.

Constant training was needed to assure uniform policy and guidance between the four watch stations. A "hot word inspection criteria" was developed to explain policy and safety concerns so that each section would provide the same level of safety, and there would be no differences in procedure that could frustrate Army personnel assigned to correct problems.

Safety teams inspected cargo at the rail head, receiving areas, convoy arrival points and staging yards. Coast Guard personnel learned how to lower ramps on Bradley fighting vehicles and armored personnel carriers. They also learned the various locations of fuel tanks on a multitude of different vehicles. Most gauges didn't work properly, which meant that the tanks had to be visually examined. The difficulty in such an apparently easy task is evident when inspecting M-1A1 tanks, which have six separate fuel cells, all of which had to be checked.

Following inspection, each vehicle was marked according to the Coast Guard cargo marking system. Vehicle identification numbers were recorded and appropriate Army personnel were informed so they could take corrective action, if necessary.

Once all problems were corrected, the vehicle was inspected again before leaving its staging area. A safety team member stationed at the final vessel staging area monitored cargo flow and verified vehicle condition prior to loading. If a vehicle was found to have any deficiency, it was returned to staging. This arrangement prevented cargo loading delays.

All vehicles were marked on the lower left side. Note the marks on the truck indicate the need to defuel.

Cargo marking system

FUEL "OK" or "Defuel"	**CARGO** "OK" or "Secure cargo" or As appropriate
INSPECTOR Section number	**SPECIAL HANDLING** "Load above decks" or As appropriate

Summary

The Coast Guard safety net expanded from the vessel to various staging areas and rail head operations to assure that all cargo was checked early. The deficiencies were corrected so as not to interfere with cargo loading operations. A loadout operation of this magnitude requires a significant coordinated emphasis on safety. This successful loadout clearly demonstrated that all safety considerations can be met without delaying crucial war materials.

By late February 1991, all military cargo scheduled to move through Barbours Cut had departed. A total of 23,323 pieces of equipment (211,705 short tons) had been loaded onto 40 ships for transport to Saudi Arabia. The emphasis on safety and expediency placed on the operation by Army, Navy, Coast Guard and port-related industries was entirely successful.

There were numerous lessons learned from this operation. Future loadout plans will reflect a greater emphasis on cargo safety, and Coast Guard reservists will be prepared with the necessary expertise in loading explosives. In addition, Coast Guard reserve personnel assigned to the Houston area must receive weapons proficiency training every six months.

In conclusion, the flexibility of the Houston Coast Guard detachment to quickly switch emphasis from security to safety concerns was possible because all personnel were cross trained in both areas. This flexibility allowed the Coast Guard to concentrate on the risk at hand, ensuring the safe movement of highly dangerous materials.

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Jacksonville . . .

a busy port in the "storm"

Dockside view of loading operations.

By PAI Helen B. Carney, USCGR

During Operation Desert Shield/Desert Storm, the Port of Jacksonville, Florida, became one of the busiest outload ports in the United States. From August 8, 1990 to May 31, 1991, more than 31,000 pieces of essential equipment and one million pounds of class "A" military explosives were loaded onto 67 Navy Military Sealift Command chartered vessels at Jacksonville.

The Coast Guard logged 86,271 manhours and 6,814 underway boating hours in the bustling port, as a direct result of the operations.

Numbers, however, don't begin to tell the story of the Coast Guard's role in the historical deployment. Nor do they convey the challenges encountered by MSO personnel, both regular and reserve Coast Guard, who were faced with the dual responsibility of expediting supplies to overseas forces, while maintaining safety on ships that had been sitting in the reserve fleet for as long as 45 years.

Normal MPS operations

Since 1986, Coast Guard reserves have assisted the Jacksonville MSO in supervising maritime prepositioned ship (MPS) operations. These operations are part of DoD's rapid deployment tactics of placing munitions-laden vessels leased by the Military Sealift Command in strategic locations around the world.

Between 1986 and August 1990, the Coast Guard conducted some 40 standard MPS operations at Jacksonville's Blount Island Terminal. Normally, up to 30 reservists are given five days of orientation and training for such operations. Most of these men and women are in port security ratings, but there are some boat crew personnel, yeomen (administrative) and other specialties involved.

The reserves, working with regular Coast Guard MSO personnel, perform the following duties during standard MPS operations:

1. review cargo manifests,
2. approve vessel stow plans,
3. inspect explosive cargo handling facilities,
4. test shoreside cargo gear,
5. inspect MPS vessels and test cargo gear,
6. conduct emergency drills,
7. operate continuous 24-hour waterside security,
8. staff a command post round-the-clock,
9. provide explosive loading teams and
10. coordinate vessel traffic control.

The experience gained from previous MPS operations, along with the quick response capabilities of reservists contributed to extraordinary efficiency. For example, the *M/V Baugh*, a Maersk Class container/RO/RO ship, was needed immediately to transport enough equipment to sustain a marine amphibious brigade in the Kuwaiti Theater for 30 days. The COTP was able to issue the explosive loading permits right away, and the vessel sailed ahead of schedule.

Division XIV of the Coast Guard Auxiliary also contributed to the Jacksonville efforts. Members provided about 300 manhours and 90 boat hours, helping with security and safety zone patrols maintained during explosives loading.

Skill and discretion

Under normal conditions, the MSO enforces strict regulations regarding the shipping of hazardous cargo. However, under conditions of national emergency, DoD is granted exceptions to many routinely enforced regulations.

MSO Jacksonville Coast Guard patrol boat maintains a security zone around vessel being loaded with DoD helicopters for deployment to the Middle East.

Emergency MPS operations

Because of the urgent Middle East developments, the usual lead time of several weeks for MPS activities was reduced to as little as 24 hours. Also the MSO workforce increased from 30 to 115 members with reserve reinforcements to support the military build up.

Besides their normal duties, regular marine safety office personnel provided logistical support to the reservists in pay, berthing, food, training, transportation and deployment.

Marine safety personnel often found themselves walking a fine line between insuring the safety of loadout operations and delaying the deployment of materials to the Middle East. For example, normally vehicles are shipped with just enough gas to drive them off of the vessel. Under emergency conditions, DoD can ship vehicles with their gas tanks 75 percent full. Some of the vehicles arrived with overfilled tanks, resulting in some spills.

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As a standard practice, ammunition is stored under very stringent guidelines. Some of the vehicles to be shipped arrived with ammunition stowed on them. On one occasion, a Coast Guard patrol on a routine port inspection found a Patriot rocket left unattended along the side of a highway.

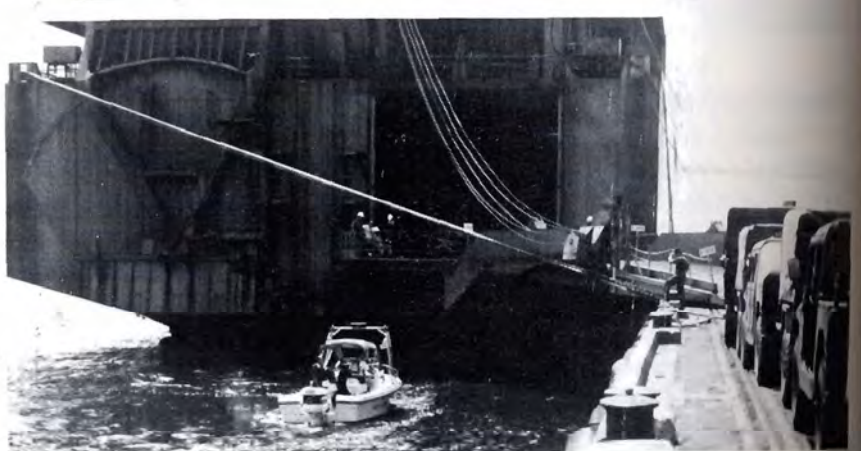
Routine precautions

Throughout Desert Shield/Desert Storm operations, the Coast Guard took the following routine precautions to ensure the safety and security of the Port of Jacksonville and the vessels being loaded with military cargo:

1. supplied armed escorts for all military vessels entering or departing the port,
2. established and patrolled safety and security zones around each vessel and the outload terminal around the clock,
3. set up an on-scene command post to coordinate security,
4. placed safety monitors and armed security on each vessel,
5. performed twice-daily harbor patrols, covering landside, waterside and overflight to ensure security of the port,
6. boarded all tank vessels entering the port,
7. reviewed the terminal security plans of all Jacksonville facilities located at the port,
8. met daily with members of the Army Transportation Terminal Unit, the Navy Military Sealift Command, the Jacksonville Port Authority, and all local law enforcement agencies to ensure the safety and security of the operations, and
9. investigated marine casualties and resolved personnel action cases directly related to Desert Shield/Desert Storm.

The Coast Guard and members of DoD's Military Traffic Management Command worked very closely to ensure that all shipments were loaded and deployed as safely as possible.

Rows upon rows of Army "HUM-V" trucks await loadout.



"HUM-Vs" line up for loadout on RO\RO vessel at Port of Jacksonville, while Coast Guard boat patrols the area.

...ed onto a vessel.

...reserve fleet challenges

From the very beginning of the operation, CAPT Robert J. O'Pezio assured that all vessels leaving the Port of Jacksonville bound for the Kuwaiti Theater would successfully complete their voyage without breaking down. He also said that commercial shipping would not be delayed because of military operations. These commitments meant long, hard hours for the members of the Marine Inspection Department.

To provide necessary logistical support, ships from the government's reserve fleet under MARAD were recalled for active service from their three locations: Concord, California; Norfolk, Virginia and Beaumont, Texas.

The reserve fleet consists of older, mostly steam-powered ships, which survived earlier conflicts, including World War II and Vietnam. These ships are inspected annually by MARAD representatives, but they seldom get underway. Consequently, many of them arrived in Jacksonville with long lists of repairs which had to be made before they could be deployed.

The Coast Guard inspectors were not only responsible for routine inspections, but also for ensuring that all repairs were done correctly.

Most of the problems with these older ships were simply factors of aging. The steam-powered vessels were prone to boiler failures, and many of the boilers had to be retubed. Also the use of asbestos was common when the ships were built, and some vessels had to be rehabilitated to insure the safety of the crews. When repairs required welding, the welds had to be tested, and the integrity of cargo holds and hatches had to be checked. (One ship had been damaged by torpedoes in World War II.)

Life-saving and firefighting equipment had to be replaced, and marine sanitation devices and condensers required by current regulations installed.

Many older mariners were brought out of retirement to operate ships in the reserve fleet. Coast Guard inspectors had to inform them about all the new regulations and requirements. (One crew member was a 70-year-old chief engineer working as a third assistant engineer to ensure that a sufficient number of steam-qualified mariners was on board.)

Realizing that the older ships were likely to experience mechanical difficulties, CAPT O'Pezio requested the assistance of the St. Johns bar pilots. The pilots conducted thorough navigational equipment tests on the vessels before they were brought into the port. The cooperation of these pilots helped prevent serious steering mishaps in the port.

Summary

It was ironical that the most highly-trained soldiers ever placed on a battle field, armed with the newest high-tech weapons, would be supplied by materials delivered in aging ships with older crews.

Only two of the 67 vessels deployed from Jacksonville experienced difficulties en route, and one ship broke down just 200 yards from the dock after being onloaded. There were no injuries or losses of equipment involved. (The inspectors who ensured the reliability of these ships also completed 600 commercial vessel inspections during the same time period.)

MSO Jacksonville is justifiably proud of its record of high performance and productivity.

Photos accompanying this article are by PAI Helen B. Carney and PA2 Alastair Worden.

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TEAMWORK spells success at MSO San Francisco Bay

By LTJG Keith T. Whiteman

Operation Desert Shield/Desert Storm was the first opportunity for San Francisco Bay area Coast Guard units to apply wartime contingency plans to a major military sealift operation.

This allowed MSO San Francisco Bay in Alameda, California, and Group San Francisco the unique opportunity to form a joint command task force to plan and conduct port safety and security operations supporting military loadout and sealift activities.

Joint efforts

As many as 20 different local commands in the San Francisco Bay area performed operational missions for Desert Shield. Many others played supporting roles.

More than 30 Military Sealift Command chartered and ready reserve force vessels were loaded with explosives at the naval weapons station at Concord or military equipment at the Oakland Army terminal. Commercial vessels also carried large amounts of containerized cargo and military vehicles from San Francisco Bay area facilities.

Nearly 50 Coast Guard reservists were called to active duty and assigned to joint command task force units for up to one year.

Operating as part of the task force, Coast Guard units devoted more than 70,000 hours in support of the Persian Gulf operations. This consisted of 50,000 hours of security zone enforcement, 15,000 hours of explosive handling supervision, 1,500 hours of vessel inspection, 600 hours of facility surveys, and the remainder for administration and planning.

Security zone enforcement

Security zones were established around the Naval Weapons Station at Concord and the Oakland Army base, and patrolled from September 1990 through February 1991. Moving security zones were also set up around vessels transporting Desert Shield cargo.

Once simultaneous security zones were required around LASH barges and the mother ship. The barges carried cargo from the weapons station to an anchorage a few miles down river. There an awaiting LASH ship loaded the barges on board. Transporting the barges down river was necessary, because the water at the pier was too shallow for a fully loaded vessel.

Reports of planned waterside protests by several groups raised some concern for vessel safety. Coast Guard and Navy small craft, 82-ft. and 110-ft. patrol boats, acted as escort vessels for the barges.

Coast Guard cutters Point Barrow and Point Chico exchange information on security zone enforcement procedures.

Coast Guard 41-footer patrols the Naval Weapons Station Concord security zone. A Military Sealift Command-chartered vessel in the background is loading ammunition bound for the Persian Gulf.

Fortunately protest activity was concentrated landside. The few waterside protesters were peaceful and didn't threaten the safe transit of the barges.

Explosive handling

The COTP is responsible for ensuring the safe loading of military explosives on board commercial vessels. A marine safety detachment at Concord, adjacent to the Naval Weapons Station, is assigned to supervise explosive handling, and ensure that vessels meet applicable federal regulations.

Regular and reserve Coast Guard personnel from the marine safety detachment inspect vessels prior to loading, checking firefighting equipment and other safety items. Loading may begin when a stowage plan submitted by the vessel master is approved by the COTP.

A team then supervises the actual loading to ensure that the stowage plan is followed and that no unsafe conditions exist. The process of loading break bulk vessels is painfully slow, and requires many people to ensure vessel safety.

Vessel inspections

MSO personnel conducted safety inspections and issued Certificates of Inspection to ten ready reserve force break bulk vessels and the *USNS Mercy*, one of two 1,000-bed hospital ships used during Desert Shield. Generally, the ready reserve ships were in adequate condition to meet deployment goals.

Security teams

The COTP dispatched teams of regular and reserve personnel to many San Francisco Bay area commercial facilities to discuss Desert Shield issues. The teams conducted abbreviated facility surveys and went over security issues with operators, making them aware of possible threats. This ensured that sufficient security measures were in place to prevent incidents.

The teams emphasized that the commercial operators were primarily responsible for the protection of their waterfront facilities and vessels, even though the Coast Guard does provide some waterside security.

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Port readiness

A port readiness committee made up of representatives of seven government agencies discusses issues relating to port security, mobilization and effective port operation during wartime. The agencies are: Military Sealift Command, MARAD, Maritime Defense Zone, Army Corps of Engineers, Military Traffic Management Command, Naval Control of Shipping Organization and Coast Guard. Port directors and industry representatives also attend committee meetings, bringing together all the key players in a port operation.

The San Francisco Bay port readiness committee met several times during Desert Storm, resolving potential problems. Most importantly, the committee fostered positive relationships between people from different organizations, resulting in cooperative action.

SBU-11

The Coast Guard also cultivated a close working relationship with the Navy Special Boat Unit Eleven (SBU-11) based in Mare Island, California. Experts in river warfare, combat patrols and surveillance techniques, SBU-11 provided people and small boats to help the Coast Guard enforce the security zone around the Naval Weapons Station at Concord.

The Coast Guard boat crews learned valuable skills from SBU-11 personnel, and, in turn, provided them with training in security zone enforcement, use of force tactics and other law enforcement procedures.

Continued cross training, Navy fleet week safety zone enforcement and a coastal defense exercise in August 1991 afforded further opportunities for joint operations between SBU-11 and Coast Guard units.

Conclusion

MSO San Francisco Bay's efforts during Operation Desert Shield/Desert Storm were successful due to the close cooperation between government and industry, the knowledge of joint operations by Coast Guard planners, the skills from reserves and regulars, and a strong devotion to duty demonstrated by everyone involved.

Coast Guard 41-footer comes alongside two Navy patrol craft, members of SBU-11, at the Naval Weapons Station Concord security zone.

Photos accompanying this article are by LT Mary Cox, USCGR.

LTJG Keith T. Whiteman is a military readiness officer with MSO San Francisco Bay in Alameda, California. Telephone: (510) 437-3143.

The United States Merchant Marine Academy, Kings Point, New York, assigned some 150 midshipmen to train aboard cargo vessels taking part in the sealift.

Midshipmen deployed to Middle East

By Mr. Martin Skrocki

Midshipmen from the United States Merchant Marine Academy took an active part in Desert Shield/Desert Storm in the Middle East. The academy, located in Kings Point, New York, was the only federal service academy to participate in the Persian Gulf operations.

Normally, midshipmen are placed aboard merchant ships throughout the world for practical shipboard experience -- an integral part of the academy's curriculum. However, with the critical need for seafarers for the massive sealift of supplies to United States forces in the Middle East, some 150 midshipmen were instead assigned to the Navy's Military Sealift Command-owned or -chartered cargo ships, and ready reserve force vessels.

Combat zone

One hundred of the midshipmen actually sailed into the geographically defined "combat zone," becoming eligible for the presidentially-authorized Merchant Marine Expeditionary Medal. Last September, Secretary of Transportation Samuel K. Skinner personally presented the medals to the midshipmen at Kings Point.

Midshipmen assigned to ready reserve fleet vessels generally were not told of their destinations. But, according to Midshipman Derek Dostie of Haverhill, Massachusetts, it was not hard to guess. "I was sailing on a military cargo ship," he notes, "and I knew the situation in the Middle East."

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Aboard the *William B. Baugh*, Dostie recalls, fire hoses were rigged to spray the decks in case of chemical attacks. He and the crew were regularly drilled in using gas masks and chemical suits, and lifeboats were kept partially lowered for emergencies.

"I was nervous at the outset," Dostie admits, "but all the precautions gave me some piece of mind."

Those who sailed to the Persian Gulf quickly became aware of the realities of the crisis. Midshipman Andrew Busk of Levittown, New York, was assigned to the vessel *Cape Lobos*. "We were anchored between a couple of ammunition ships for ten hours," he recalls. "If anything happened, it'd be over."

Problems en route

Trips to the Persian Gulf were anything but routine. Midshipman Andrew Miller, for instance, was assigned to the ammunition ship *Cape Breton*, a 1960s vintage vessel which had been inactive for the last few years.

During the voyage from California to the Gulf, the *Cape Breton's* engines failed three times, notes Miller, of Indian Hills, Colorado. "But the engineering crew was so good," he says, "that we got the ship underway each time."

Miller admits to some apprehension riding a ship loaded with 8,800 tons of high explosives. When the vessel entered the Straits of Hormuz, they were challenged by two Iranian gunboats. "We were relieved that they gave us a quick look and then sped away," he recalls.

Another midshipman, Steven Buckner of Mustang, Oklahoma, was awarded the Meritorious Public Service Award, the Navy's third highest civilian honor. Buckner was assigned to a Military Sealift Command when he learned that special pins were missing which were needed to mount machine guns to the ship's cargo of Marine Corps amphibious vehicles. He fashioned the necessary pins from scrap metal in the machine shop, and the vehicles arrived at their Persian Gulf destination combat ready.

Tributes

Last June, Vice President Dan Quayle paid tribute to the midshipmen in his commencement address at the United States Merchant Marine Academy. "They worked side-by-side with regular crew members -- ten, 15, 18 hours a day -- to keep their cargo ships steaming ahead," he said.

The academy's color guard carries a battle standard along with the United States and academy flags. The standard is adorned with streamers signifying the academy's participation in World War II, Korea and Vietnam. Joining these streamers is a colorful new one -- for Persian Gulf service.

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Secretary of Transportation Samuel K. Skinner presents the Merchant Marine Expeditionary Medal to Midshipman Andrew Busk, who sailed into the Persian Gulf aboard the M/V Cape Lobos.

Wilmington MSO loads 37% of all Class "A" explosives

By ENS Gregory A. Howard

A normal working day at MSO Wilmington, North Carolina, revolves around oil pollution responses, hazardous chemical releases, pollution case file preparation, commercial vessel and waterfront facility inspections and a variety of other Coast Guard activities. The entire office operation, however, was altered in early August 1990.

A well orchestrated blend of military and reserve personnel tackled a myriad of extra duties related to Desert Shield/Desert Storm, while at the same time conducting the MSO's very busy "normal" daily routine.

From August 1990 to May 1991, MSO Wilmington Coast Guard men and women worked alongside Army, Navy and Marine Corps active, reserve and civilian personnel, monitoring the loading of 500,000 short tons of military vehicles, aircraft, troop support equipment and explosives.

About 37 percent of all Class "A" explosives supporting Operations Desert Shield and Desert Storm were loaded by longshoremen and military personnel onto ships departing from three North Carolina ports under MSO Wilmington. They are the North Carolina state port in Wilmington, Morehead City, and the Military Ocean Terminal Sunny Point in Southport, the largest military ocean terminal in the country.

As loadout operations increased in other East Coast locations, Coast Guard reservists were reassigned to Newport News Marine Terminal, Newport News, Virginia; South Carolina State Port, Charleston; and Military Ocean Terminal, Bayonne, New Jersey.

Security roles

The shoreside and waterside security roles for MSO Wilmington consisted of patrols and vessel escorts. Coast Guard personnel conducted patrols on small craft ranging from 19-foot rigid

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Munitions are loaded aboard the Military Sealift Command ship, Cape Nome, at Sunny Point.

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hull inflatable boats to 110-foot patrol boats. Their efforts focused on maintaining security zones established to suppress any subversive threat during operations at the three ports. Cutters *Gentian, Primrose* and *Blackberry* laid and serviced aids to navigation marking a security zone at Sunny Point, which was dubbed the "line of death."

Other important security duties included protecting key military flag and general officers overseeing operations under their control, conducting rescue crash patrols for more than 100 helicopter sorties and boarding vessels on Cape Fear River for law enforcement purposes.

Needing outside support to maintain the necessary security, MSO Wilmington's commanding officer requested resources from other Coast Guard units, including the group at Fort Macon, Georgia. Consequently, the cutters *Point Martin, Point Warde, Point Highland, Point Brown* and *Matinicus* were assigned to North Carolina.

Labor force

The majority of Coast Guard personnel came from the select reserve. From August 12 to 30, 1990, 30 reservists were activated. That number grew to 140 by March 14, 1991. Added to the 32 men and women on active duty, MSO Wilmington multiplied by nearly six its peacetime contingent.

While these figures are not staggering, consider the fact that they represent only seven percent of the total Coast Guard members assigned to Desert Storm operations, but that 37 percent of all Class "A" explosives shipped to the Persian Gulf were loaded in Wilmington's COTP zone.

Work hours

The security operations combined with loadouts and day-to-day safety duties required that MSO Wilmington personnel work around-the-clock. Subsequent fatigue, plus the heat of summer and cold winds of winter, hindered security patrols, law enforcement boardings and vessel inspections. Despite these difficult conditions, 500,000 work hours were completed without a lost-time accident.

Port security officers confer with longshoreman regarding proper loading procedures for explosives.

Reserve training

Work hours dedicated to law enforcement training skyrocketed during the Gulf war. Active duty personnel, a training team from the Fifth District and a law enforcement detachment from Fort Macon combined to instruct more than 100 select reservists.

Training included night fire and boarding officer exercises, self defense, weapons skills, anti-terrorism tactics and boating while intoxicated enforcement. This crucial training allowed reservists to fill security positions rapidly.

Increased duties

During the period of operations, the number of day-to-day marine safety tasks increased substantially. The primary reason for this was a rise in vessel activity.

Normally, over the same period of time, only two or three facilities and about 25 vessels would have been inspected. However, there were 17 facility and 113 vessel inspections. During the same time, MSO personnel also responded to 116 reports of oil spills.

This was over and above the 500,000 work hours devoted to the Persian Gulf operations.

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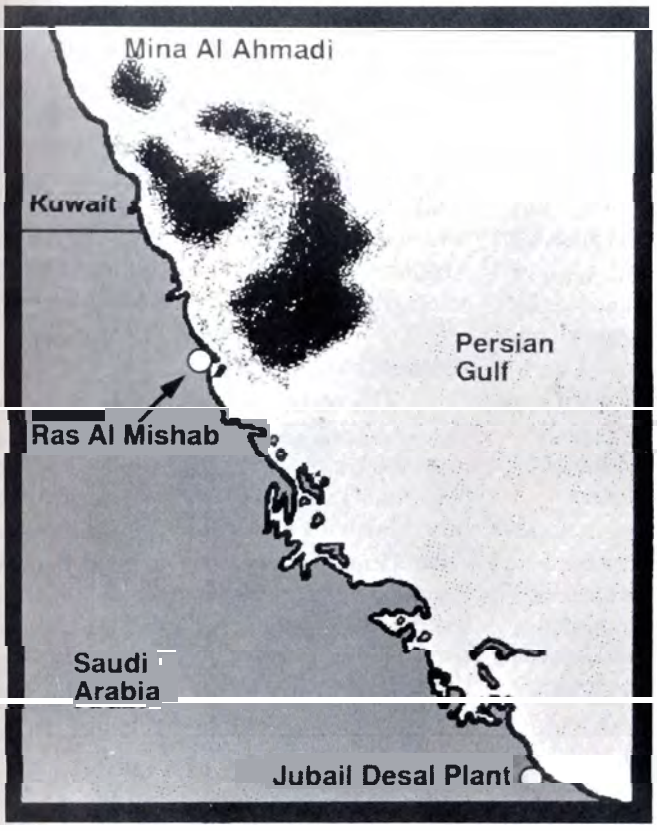
World's largest oil spill. . .



Position of spill on January 28, 1991. Satellite imagery provided by DoD.

OPERATION CLEAN UP

By CDR Douglas A. Lentsch and LCDR James M. Obernesser

Introduction

In late January 1991, the coalition forces of Operation Desert Storm were firmly entrenched in Saudi Arabia, making plans to push into Kuwait to free that country from the invading Iraqi troops. Probably to slow or stop an amphibious landing of coalition forces in Kuwait and Saudi Arabia, Iraqi troops caused a series of major oil discharges from facilities and vessels in both Kuwait and Iraq.

Estimates of the entire amount of oil discharged range from six to eight million barrels or approximately 30 times the size of the 1989 Exxon Valdez oil spill in Prince William Sound, Alaska.

The main oil slick was probably between one-half to three million barrels. The emulsification process and the deposition of sand blown onto the slick increased the bulk of the oil, causing a portion of the slick to sink. Damage assessment is ongoing. It will take years before the total effects of the discharges are fully determined.

The bulk of the oil discharged from the multiple sources merged and formed a massive slick that slowly worked its way down the coast of Saudi Arabia, nearly coating the coast from Khafji to Abu Ali Island.

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Request for assistance

On January 24, the government of Saudi Arabia requested technical assistance from the United States ambassador. This request was due to the expertise of the United States gained in handling the *Exxon Valdez* spill and was consistent with the recently signed IMO International Convention on Oil Pollution Preparedness, Response and Cooperation, 1990. (See page 48.)

The Department of State referred the Saudi request to the National Response Team, which is responsible for developing and carrying out the National and Hazardous Substances Pollution Contingency Plan in the United States.

Response

The Environmental Protection Agency and the Coast Guard, leaders of the response team, quickly identified other member agencies critical to the response. These agencies immediately assembled an assessment team capable of managing the environmental response issues that might have to be addressed.

The amount of planning, assembly and briefing necessary to prepare the representatives to proceed into a combat zone for environmental concerns was monumental, yet the United States Interagency Assessment Team was en route to the Gulf on Coast Guard aircraft within 30 hours. This rapid departure was brought about by overcoming many logistical and administrative hurdles associated with travel to the Gulf, further complicated by the fact that it took place on a weekend, when support services are scarce.

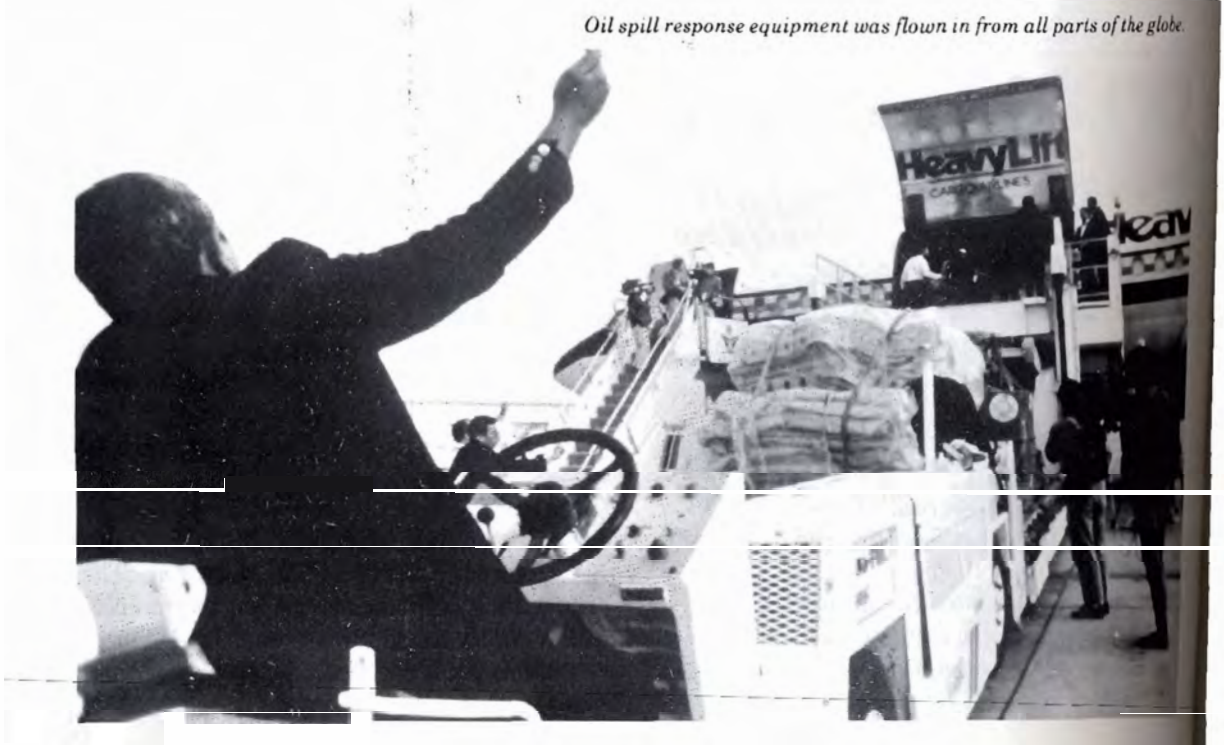
These coordinated activities demonstrated a spirit of teamwork developed during the extensive *Exxon Valdez* operations, and generated by the realization that rapid response is critical to minimizing environmental damage.

The Marine Environmental Protection Division of the Office of Marine Safety, Security and Environmental Protection combed the Coast Guard for pollution experts who could work cohesively with representatives of the Saudi Arabian government to make a positive impact on cleaning up the spill.

Assessment team

The initial United States Interagency Assessment Team consisted of pollution experts from the Environmental Protection Agency, National Oceanic and Atmospheric Administration, United States Army Corps of Engineers and Coast Guard. The Department of Energy, the Fish and Wildlife Service of the Department of the Interior, and the Spill Control Association of America later joined the effort. While deployed, the team was supported by its parent agencies and the National Response Team.

Oil spill response equipment was flown in from all parts of the globe.



For example, Coast Guard Marine Environmental Protection personnel established a 24-hour watch to support the team and act as a local point for hundreds of offers of assistance to the Saudi Arabian government. The National Oceanic and Atmospheric Administration set up a team within Coast Guard headquarters to address environmental issues and convert Persian Gulf currents, weather and overflight data into daily spill trajectories.

Since the overall spill could have had a disastrous effect on the activities of coalition forces, the situation quickly gained extremely high level interest in the United States government. The White House designated the Coast Guard to act as spokesperson for the government and the senior Coast Guard officer was assigned to lead the interagency team.

Captain Don Jensen, officer in charge of the interagency team, confers with members of the international community on overall oil spill response strategy.

It was determined that the assessment team's mission should not be to clean up the discharges, but to assess their magnitude and impact on Saudi Arabia and advise the Saudi government on appropriate response strategies and techniques, and to train local clean up workers.

During this period, the oil slick continued to move southward. The governments of Bahrain, Qatar and the United Arab Emirates also requested the assessment team to visit their countries and help prepare response strategies.

Unique problems

At no point in history has there ever been a mobilization of oil spill response forces within a war zone. Responding to a massive oil discharge in a hostile environment posed many logistical and unique problems. The intense pressure involved hampered response activities.

For example, personnel were subjected to constant threats of SCUD attacks, and the possibility of nerve or biological agents carried in the warheads. Open water skimming operations were extremely hazardous due to submerged and floating mines.

There were many travel restrictions throughout Saudi Arabia. Access to waterfront facilities was difficult for security reasons. Communications were equally difficult since much data, normally readily available during an oil discharge, such as weather information, discharge trajectories and aircraft arrival times, was classified during Operation Desert Storm.

Organization of response

As the magnitude of the discharges became more apparent, many countries sent offers of assistance of equipment and/or personnel to Saudi Arabia. Foreign experts were integrated into both the United States assessment team and the Saudi Arabian response organization. Collectively, these advisors became known as the International Interagency Assessment Team.

Due to his operational experience, organizational skills and early arrival, the Coast Guard team leader continued to serve as the principal advisor to the Saudi Arabian Meteorological and Environmental Protection Agency and its on-scene coordinator. An IMO representative took over the leadership of the international team.

United States team members set up a computer data base to catalog and evaluate offers of commercial cleanup contractors and private vendors from all over the world. (More than 500 offers were processed by the end of February.)

Data on new technologies was evaluated for possible use by a scientific committee at King Faud University in Riyadh, Saudi Arabia. The committee, assisted by the United States and the international assessment teams, helped with shoreline assessments, determining clean-up priorities, establishing wildlife rescue and rehabilitation centers, ensuring the use of proper clean-up techniques and developing practical shoreline rehabilitation programs for after the dispersal of the spill.

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FROM ABOVE - - Coast Guard aircraft tracked the movement of the oil spill daily.

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Coast Guard Marine Environmental Protection personnel acted as the initial clearinghouse for offers of assistance. This effort was eventually passed on to IMO, which set up a coordination center in London to screen and sort the many offers from all over the world. During the first few days, Australia, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Japan, the Netherlands, New Zealand, Norway, Poland, Spain, Sweden, the United Kingdom, the United States and the Union of Soviet Socialist Republics all offered assistance.

In March, IMO received donations of $4.5 million from governments worldwide, which was placed in a newly established Gulf Pollution Disaster Fund. IMO used these funds to protect and clean up environmentally sensitive areas, such as Karen Island, one of the main green turtle egg-laying locations in the Gulf.

Critical problem

About one month before the spill, a revision to the Saudi Arabian Oil Spill Contingency Plan gave the overall management of a catastrophic oil spill response to the Meteorological and Environmental Protection Agency. The agency had the requisite authority, but had not developed the organization, experience, tools and other resources necessary for the gigantic task.

Within the country, most agencies were assigned to protect their own resources, such as refineries, desalination plants and other industrial facilities. The lack of coordination between these agencies presented the United States assessment team with its first and most critical problem.

The team had to devise means to develop a response organization from discrete entities that did not function well together, and cajole them into cooperating with one another. Drawing on the *Exxon Valdez* experience, including the Coast Guard's catastrophic spill plan, the United States assessment team played a critical role in recommending the organizational structure that was basically adopted in early February.

Acquiring timely data

Timely information regarding the extent, characteristics and trajectory of the massive oil slick was essential for making response recommendations. When the United States Interagency Assessment Team arrived in Saudi Arabia, the leading edge of the discharge was south of Ras Al Khafji, the scene of the first ground action of Desert Storm.

Initially, the team had to rely on DoD satellite imagery for indications of the overall extent of the slick. The team advised the Saudis of the need for accurate daily overflight data and constant tracking of the oil slick's position. Members of the team knew they would not have access to the entire spill, due to military operations and airspace restrictions in the northern Gulf region.

On January 30, using United States Navy aircraft, United States and Saudi observers started daily overflights. The extent of the initial observation covered only the slick's leading edge in the areas south of Ras al Mishab. Eventually, Saudi observers became proficient enough to conduct most of the coastal flights. However, much of the needed information was unattainable due to cloud cover, airspace restrictions and other hindrances.

On February 6, the Saudi government requested the use of the Coast Guard's AIREYE oil detection and tracking system mounted on a HU-25 Falcon jet. The product of Coast Guard-sponsored research and development projects, the AIREYE uses sophisticated sensing devices including side-looking airborne radar to provide a film image of the oil on the surface of the water. This radar produces film recordings of the exact position and nature of the discharges.

The Coast Guard provided two AIREYE-equipped HU-25 Falcon jets and an aviation detachment for support. The aircraft and crews operated out of Manama Airport in Bahrain.

The first AIREYE overflight was conducted on February 27. Within a week, two daily flights were made, using different grid patterns to provide and confirm data.

By this time, the coalition forces had achieved air superiority, providing safer airspace for the overflights. There was still concern, however, about the danger of missiles and other hostile fire.

The National Oceanic and Atmospheric Administration interpreted the observation data and incorporated it into a computer model that was used to validate and predict future movements of the slick.

When the war ended, reliable information for the entire Gulf area was available, and AIREYE operations ceased on April 27. By then, most of the free-floating oil had washed up onto the shorelines along the Gulf.

Saudi priorities

The United States Interagency Assessment Team also helped Saudi Arabia set up an operations center from which to direct the response. The first step was to develop an overall national response strategy, based on the following Saudi priorities:

- protection of vital industrial facilities and oil refineries (critical to maintain the war effort);

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FROM BELOW -- A local citizen surveys ribbon of oil and shoreline damage.

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- protection of environmentally sensitive areas;
- recovery of oil in strategic offshore locations to minimize shoreline impact; and
- removal of oil from shoreline areas to prevent it from moving down the coast.

Due to the magnitude of the spill, and the lack of funding and equipment, a priority ranking system was developed for facilities and environmentally sensitive areas. The Saudi Arabian Meteorological and Environmental Protection Agency's on-scene coordinator made a national priority list, and the limited equipment was moved to highest priority sites to protect it from the advancing oil discharges.

The United States assessment team helped develop protective measures for high priority facilities. These included diversionary booming around the mouth of the inlet areas, containment booming and oil recovery skimmers at strategic locations. The basic goal of all initial operations is the recovery of free-floating oil, so that it does not harm sensitive shorelines.

Oil recovery

Three skimming vessels were deployed in offshore operations. The largest vessel recovered more than 100,000 barrels of oil/water mixture during its first 30 days of operation. (The vessel's captain reported six-inch oil slicks that emitted strong vapors for up to three weeks after the discharge.) Skimming operations were slow due to constant mine threats.

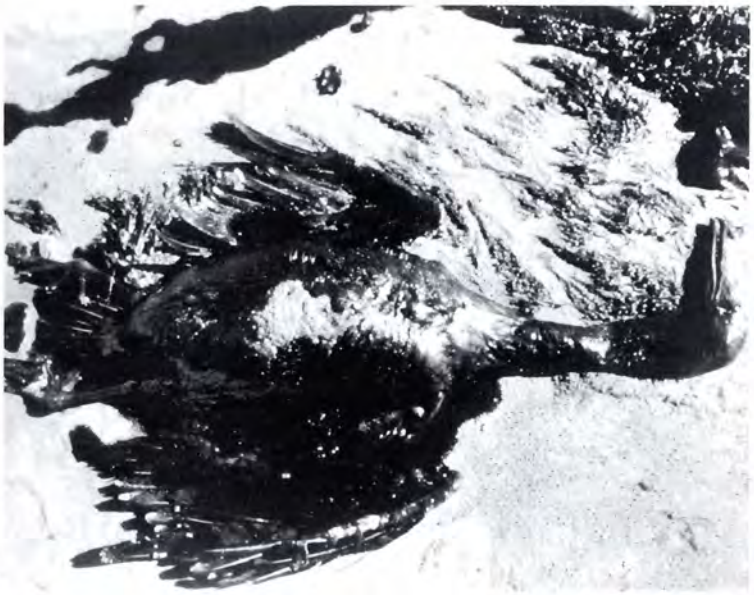
Recovery of free-floating oil was conducted near shore and in bays and inlets where it was concentrated into pools many inches thick. Initial rapid progress was made due to the oil's thickness. Lesser amounts were collected after mid-April as the oil became thinner

LCDR Glen Wiltshire lifts a dead cormorant from a heavily oiled beach in Saudi Arabia.

The southern oil migration halted at Abu Ali Island, but not by recovery efforts. The shape of the island, prevailing onshore winds, an adjacent reef and a causeway connecting the main land to the island prevented any large amounts of oil from passing Abu Ali Island and moving far enough south to damage critical facilities.

Primary shoreline remedial response efforts took advantage of natural collection areas, formed by winds and currents forcing the oil into large pools. The construction of berms and jetties enhanced the collection points. Trenches were dug into the shoreline to collect oil in the incoming tide.

The combination of enhanced natural collection points and trenches facilitated the shoreline cleanup effort. Pumps of all descriptions recovered the pooled oil.



Wildlife devastated by the spill littered beaches all over Kuwait and Saudi Arabia.

Photos accompanying this article are by PA1's Chuck Kalnbach and Steve Sapp.

Where the impact was the heaviest, the oil mixed with sand, forming asphalt about a foot thick in some places. These areas included salt marshes, mangrove swamps, and intertidal creeks and streams.

When the Coast Guard left Saudi Arabia at the end of July, reports indicated that about 1.4 million barrels (about 58.8 million gallons compared to the entire *Exxon Valdez* spill of 11 million gallons) of oil had been recovered and pumped into pits onshore for natural separation and further recovery.

Gulf threat diffused

During the entire process, another significant issue was recognized and addressed by the assessment teams. Oil had been collecting in massive land pools as a result of the damaged oil fields in Kuwait, and posed a major potential threat to the Gulf waters. Many of these wells and pools were less than four miles from the coast. Estimated oil accumulation was 100,000 barrels a day for every million barrels a day of oil lost from the damaged oil fields.

By the end of April, these sources were no longer considered to be a threat, as virtually no significant amounts of free-floating oil remained in the Gulf. Therefore, there were no additional substantial threats to the Saudi shoreline.

Wildlife rescue

The Saudi coastline has several wetlands, salt marshes, mudflats and mangrove swamps which provide habitats and nesting areas for many migratory and native birds, including the flamingo and the endangered socotra cormorant. Some areas in the Gulf are also home and nesting sites for green turtles, dugongs (Gulf cousins of the manatee) and active coral reef systems.

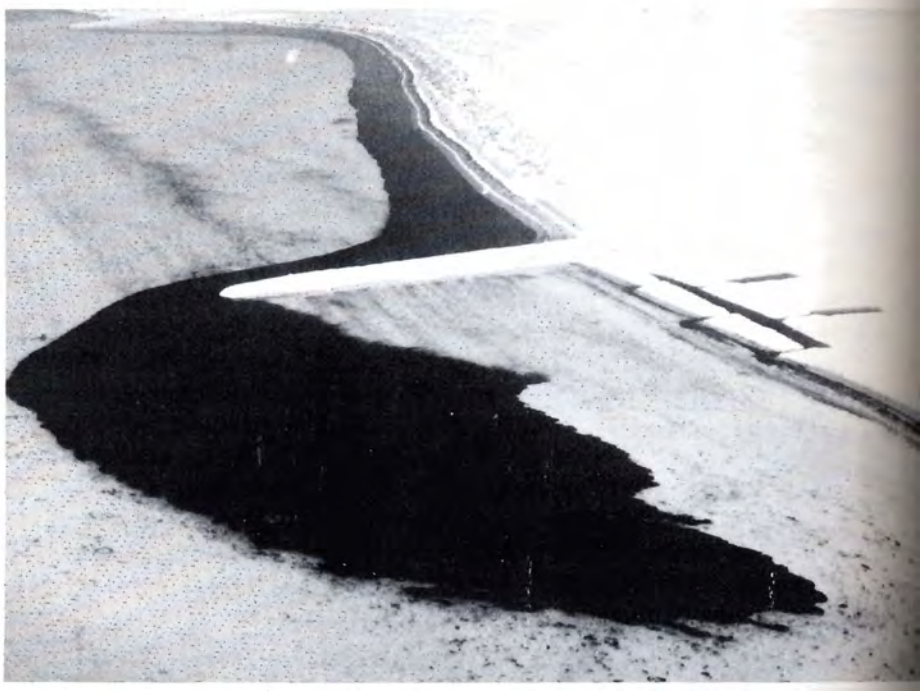
Due to a lack of equipment and the remoteness of some of the areas, many of these sites were not protected and thousands of birds were casualties of the discharges.

Efforts to respond to and ease the damage to the coastal ecosystem began while the oil was still moving southward. Wildlife rescue projects were established. Hundreds of birds have since been rescued and rehabilitated.

Conclusion

The United States Interagency Assessment Team completed its work and returned home on July 31. Coast Guard members of the team and the AIREYE complement fulfilled their missions in an extremely professional manner. Their virtual round-the-clock efforts in tracking the spill, developing a spill response management organization, and assessing pros and cons of countless clean-up techniques, all during a wartime setting, reflect highly upon the Coast Guard.

CDR Douglas A. Lentsch is the chief and LCDR James M. Obernesser is a staff member of the Pollution Response Branch of the Marine Environmental Protection Division of the Office of Marine Safety, Security and Environmental Protection.
Telephone: (202) 267-2611.



Oil spill clean up site on beach in Saudi Arabia. Coast Guard prepared oil recovery pits.

Photo by

CAPT Robert Luchum.

New international convention battles environmental catastrophe

By LT Mark McEwen

When Iraq invaded Kuwait in August 1990, little public thought was given to the potential for environmental catastrophe in this oil rich region.

On January 19, 1991, however, environmental considerations suddenly became a major international concern, when Iraqi forces began to release crude oil onto the Arabian Gulf in efforts to harass allied forces and disrupt any potential amphibious landing on Kuwaiti beaches. Crude oil was released from anchored oil tankers and shore terminals from Mina Al Ahmadi, Kuwait and Mina Al Bakr, Iraq. Anchored tankers were also pumped out northeast of Bubiyan Island, Kuwait, while the Kuwaiti refinery at Mina Abd Allah was sabotaged, resulting in a massive release of refined products.

Initial estimates of the amount of oil released into the water ranged from 130 to 450 million gallons. The final figure will probably never be known. But if the range of these estimates is averaged, the Gulf discharge would be 30 times that of the *Exxon Valdez* spill, the largest spill in American history.

The Saudi Arabian government and its allies knew they had to respond, if only to stop the enormous damage being inflicted on the environment of Saudi Arabia and Kuwait, as well as the possible impact on Saudi desalinization plants on the Gulf coast. They had a mechanism -- the International Convention on Oil Pollution Preparedness, Response and Cooperation, 1990 -- that was not available to the United States in responding to *Exxon Valdez*.

The new tool

Partly as a result of the *Exxon Valdez* spill, representatives of various governments met under the auspices of the International Maritime Organization (IMO), the maritime agency of the United Nations, to forge an agreement on oil pollution response and cooperation.

In November 1990, at IMO headquarters in London, representatives of 80 countries of diverse interests put aside their differences to create the potential for a common bond -- protecting the world's marine environment from oil pollution. The breadth of interest in this initiative was demonstrated by the fact that this was the largest diplomatic conference in IMO's history. The United States, fresh from its *Exxon*

Valdez experience, played a major role in financing the conference and providing ideas which resulted in the adoption of the convention.

This International Convention on Oil Pollution Preparedness, Response and Cooperation envisions a worldwide network of pollution response equipment, personnel and expertise. Information sharing is encouraged and guidelines for financing response activities are provided. IMO is designated as an international assistance clearinghouse that all nations can access when preparing for and combatting oil spills.

It is unlikely that any of the representatives at the conference envisioned that their work would be instrumental in combating a catastrophic act of environmental terrorism just a few weeks later. The ink was barely dry on this agreement, when the system it envisioned was put to the test in the Arabian Gulf.

As it turned out, the oil pollution agreement was able to provide the framework for the international response to the oil discharge in the Gulf without its having come into effect. That the convention was capable of making a positive impact even before a single nation had ratified it, is dramatic testimony to the power of the idea of international cooperative agreements for environmental protection.

Initial assessment

As IMO began preliminary efforts to put provisions of the convention into effect in the Gulf, the United States was already involved in the first stages of a response. On January 24, at the request of the Saudi government, the United States Interagency Assessment Team was dispatched to the Arabian Gulf.

Assembled by the United States National Response Team, the initial assessment team consisted of pollution experts from the Environmental Protection Agency, National Ocean and Atmospheric Administration, United States Army Corps of Engineers and Coast Guard. The Departments of Energy and Interior, and a private industry pollution expert participated in subsequent activities.

Oil spill center

At the same time, an oil spill coordination center was being formed at IMO to act as a clearinghouse for offers of assistance from all nations. The center was headed by Coast Guard Commander David Pascoe, who is on loan to IMO for two years to help put the convention into effect.

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Environmental Protection Agency representative Bob Caron gathers samples from waves of oil cascading ashore in Saudi Arabia.

Photo by PA1 Steve Sapp.

Oil impact on salt marshes.

Photo by CAPT Robert Luchum.

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Additional Coast Guard personnel on temporary duty at IMO helped representatives from many countries to create a framework from which to carry out provisions of the convention and coordinate offers of assistance to the Gulf.

As soon as the IMO center was firmly established, the United States Interagency Assessment Team was brought under its umbrella to become part of an international interagency assessment team. United States pollution technicians continued to perform their same functions, but under IMO auspices as part of an international exchange.

Oil tracking

The international interagency assessment team was assisted by representatives of a National Oceanic and Atmospheric Administration discharge assessment and tracking team located at Coast Guard headquarters. This team analyzed data sent from the spill site and forecasted spill trajectories for response personnel in theater. The trajectories allowed responders to make the best use of their limited resources to protect the most sensitive and vital sites from the onslaught of the oil.

Much of the data came by way of the "AIREYE" system, an oil detection and tracking device mounted on a Coast Guard HU-25 falcon jet. Delivered to the Gulf at the request of the Saudi government, the system is a product of Coast Guard-sponsored research and development. It uses sophisticated sensing devices including side-looking airborne radar to provide a film image of the oil on the surface of the water.

Cooperative efforts

The International Convention on Oil Pollution Preparedness, Response and Cooperation was successful in channeling resources to meet environmental emergencies, even under wartime conditions. Although hampered by lack of resources, responders tracked the spill and protected some of the most strategic sites. Many nations and agencies helped contain and clean up the vast discharge.

The Coast Guard and IMO are justifiably proud of their work in applying convention concepts in the Gulf region. There was a high level of cooperation among many nations battling the common threat of environmental devastation. The convention's vision of an international network of information, resources and expertise sharing had become a reality, even though it was too new to be in force.

Ratification

In late October, 1991, the United States Senate gave its advice and consent to ratification of the International Convention on Oil Pollution Preparedness, Response and Cooperation. It is quite possible that the United States will become the first nation to ratify this convention, which has already been tested under fire and proven its mettle.

LT Mark McEwen is a staff member of the Environmental Coordination Branch of the Marine Environmental Protection Division of the Office of Marine Safety, Security and Environmental Protection.
Telephone: (202) 267-0419.

Nautical queries — January-February, 1992

The following items are examples of questions included in the third assistant engineer through chief engineer examinations and the third mate through master examinations.

Engineer

1. When changing the direction of propeller shaft rotation in a diesel plant equipped with a pneumatic clutch, you must pause at neutral to allow the _____.

A. fuel rack to readjust
B. engine to slow down
C. propeller to stop
D. clutch to deflate

2. Which method(s) of testing metals measure(s) the ability of a metal to absorb energy of a load rapidly applied to the timber?

A. Brinell only.
B. Charpy only.
C. Charpy and Brinell.
D. Rockwell and Brinell.

3. The capacity of a submerged tube-type evaporator may be kept constant as scale forms on the tube nest by _____.

A. increasing the feedwater rate
B. increasing the coil pressure
C. decreasing the brine density
D. decreasing the vacuum in the unit

4. To minimize boiler damage if a waterwall tube suddenly fails, the water level begins to fall very slowly. You should continue the feedwater supply and immediately _____:

A. reduce the firing rate of the boiler
B. secure the forced draft fans
C. secure the boiler
D. gag the drum safety valves to prevent loss of steam

5. Which statement (s) is/are correct for decks and bulkheads which are penetrated by electrical cables?

A. If properly installed, stuffing tubes will prevent progressive flooding where cables pierce watertight.
B. Bushings having rounded edges and a bearing surface of at least 0.25 inch in length are required for all cables that pass through deck beams.
C. Where cables pierce main vertical zone bulkheads, arrangements must be made to ensure that the fire resistance to impaired more than 10 percent.
D. All of the above.

6. The generating tubes in an operating boiler will overheat and possibly fail when the boiler reaches the end point of _____

A. evaporation
B. generation
C. combustion
D. circulation

7. To determine that a compartment contains enough oxygen to sustain life, you should use a/an _____

A. explosimeter
B. oxygen indicator
C. fresh air indicator
D. any of the above

8. If your vessel's Certificate of Inspection requires six B-11, two A-11 and one B-V fire extinguisher, what will you need?

A. Six 2 1/2-gallon soda-acid, two 2 1/2-gallon foam and one 40-gallon foam.
B. Six 2 1/2-gallon foam, two 15-pound CO_2 and one 30-pound dry chemical.
C. Six 15-pound CO_2, two 2 1/2-gallon foam and one 50-pound CO_2.
D. Eight 2 1/2-gallon foam and one 100-pound CO_2.

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Deck

1. Which measure should NOT be taken to reduce the pounding of a vessel in a head sea?

A. Add ballast in afterpeak.
B. Add ballast forward.
C. Alter course.
D. Reduce speed.

2. BOTH INTERNATIONAL & INLAND -- You are in restricted visibility and hear a fog signal forward of the beam. Nothing appears on your radar screen. The rules require you to _____.

A. stop your engines
B. sound two prolonged blasts of the whistle
C. sound the danger signal
D. slow to bare steerageway

3. Which of the following is true concerning lifeboat gripes?

A. They must be released by freeing a safety shackle.
B. They should not be released until the boat is in lowering position.
C. They may be adjusted by a turnbuckle.
D. They are normally used only with radial davits.

4. You are on an ice-reinforced vessel about to enter pack ice. You should _____

A. enter the pack on the windward side where there is a well defined ice edge
B. trim to an even keel or slightly down by the bow to take maximum benefit of the ice reinforcement
C. take maximum advantage of coastal leads caused by offshore winds
D. look for areas of rotten ice and enter perpendicular to the ice edge

5. A vessel's quarter is that section which is?

A. Abeam.
B. Dead astern.
C. Just forward of the beam.
D. On either side of the stern.

6. On a cargo vessel, fire and boat drills must be held within 24 hours of leaving port if the percentage of the crew replaced was more than _____.

A. five percent
B. ten percent
C. 25 percent
D. 40 percent

7. All of the following can be determined by use of a stabilogauge, EXCEPT _____.

A. metacentric height
B. mean draft
C. moment to trim one inch
D. deadweight

8. INLAND ONLY -- A vessel of less than 20 meters at anchor at night in a "special anchorage area" _____.

A. must show one white light
B. need not show any lights
C. must show two white lights
D. must show a light only on the approach of another vessel

9. Which statement is true concerning life preservers?

A. Buoyant vests may be substituted for life preservers.
B. Life preservers are designed to turn an unconscious person's face clear of the water.
C. Life preservers must always be worn with the same side facing outwards to float properly.
D. Stained or faded life preservers will fail in the water and should not be used.

Answers

Engineer
1-D, 2-B, 3-B, 4-C, 5-A, 6-D, 7-B, 8-D.

Deck
1-A, 2-D, 3-C, 4-D, 5-D, 6-C, 7-C, 8-B, 9-B.

If you have any questions concerning "Nautical Queries," please contact U.S. Coast Guard (G-MVP-5), 2100 Second St., S.W., Washington, D.C. 20593-0001. Telephone: (202) 267-2705.

Chemical of the month

4/C Julie Mehta

Benzene

Benzene, a clear colorless, flammable liquid compound is the simplest hydrocarbon of the aromatic group. It has the formula C_6H_6. Once extracted from coal tar, benzene has been produced from petroleum since 1950. Benzene and toluene can also be separated from gas fractions.

The chemical was discovered in 1825 in illumination gas made from whale oil by the English chemist Michael Faraday. Its structure, which has been developed by various chemists, consists of a regular hexagon: a carbon atom at each angle with hydrogen attached at each carbon atom.

Many Uses

Widely used in industry, benzene is an intermediate that is used to produce many chemical compounds. Styrene and cyclohexane are major products of benzene. Other compounds produce detergents, dyes, aniline and insecticides. Many useful compounds are formed when the chemical is combined with chlorine.

Benzene contributes to the production of pharmaceuticals, varnishes and plastics. It also serves as an excellent solvent. In addition, benzene can act as a starting agent for reactions. Because of its explosive mixture with air, it can be used as fuel component for internal combustion and it is an excellent octane enhancer.

Major Hazards

Benzene is acutely and chronically toxic and flammable. Exposure to high concentrations of benzene vapor will lead to acute poisoning, as the central nervous system is affected. As with other anesthetic gases, symptoms include a period of excitation followed by depression. Death can result through respiratory failure.

Benzene vapor can irritate eyes, nose and throat. When inhaled, the chemical can cause headache and difficulty in breathing, which may lead to unconsciousness and/or death.

The hazards for chronic toxicity are equally serious. Repeated inhalation of low concentrations of the chemical (below 100 pm) can lead to severe or fatal anemia. Leukemia (a cancer), other serious blood disorders, and death have been caused by contact with benzene vapors.

Artificial respiration and oxygen should be given to a victim whose breathing has stopped after exposure to benzene. It can also be absorbed through the skin. If liquid benzene is exposed to skin, immediately flush the areas with water. A victim who has swallowed benzene and is still conscious should be given water or milk to drink.

The chemical is extremely flammable, and resulting fires and/or explosions are potential dangers. Benzene vapor is heavier than air and may travel to a source of ignition and flash back.

Dry chemicals, foam or carbon dioxide can fight benzene fire. Water should be used to keep fire-exposed containers cool. A self-contained breathing apparatus should be worn, as well as rubber gloves, face shield, hard hat and protective clothing.

In case of a spill, water may be used to flush spills and disperse vapors. Benzene pollutes water and, even in low concentrations, can kill aquatic life. The likelihood of over exposure to benzene during a crude oil spill response is presently under investigation.

The Occupational Safety and Health Administration set the standard of exposure to no more than 1 ppm benzene during an eight-hour work day and a 5 ppm short-term exposure limit for up to 15 minutes a day. This was changed to 0.1 ppm as an exposure limit guideline.

Shipping

Benzene is usually shipped in small glass containers, one-gallon cans, five- to 55-gallon metal drums, tank cars and trucks, and in bulk by tank barges and parcel tankers.

Care should be taken when loading benzene. On cargo ships, restricted gauges should be used, and vents should be sufficiently high (about 12 feet above deck).

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COAST GUARD ISSUES BENZENE FINAL RULE

Effective January 15, 1992, a final rule reduces the amount of benzene workers can be exposed to on vessels that carry the liquid in bulk.
See Keynotes - Page 57 for details.

Benzene

Chemical name:	Benzene	
Formula:	C_6H_6	
Synonyms:	Benzol, phenyl hydride, coal naptha and cyclohexatriene	
Physical description:	Clear, colorless, flammable liquid	
Physical properties:		
Boiling point:	176°F	(80.1°C)
Freezing point:	42°F	(-5.5°C)
Vapor pressure:		20°C (68°F) 77 mmHg
Threshold limit value:		
Time weighted average:		1 ppm; 3.30 mg/m^3
Short-term exposure limit:		5 ppm; 16.1 mg/m^3
Flammability limits in air:		
Lower flammability limit:		1.3% volume
Higher flammability limit:		7.1% volume
Combustion properties:		
Flashpoint (c. c.):		12°F (-11°C)
Autoignition temperature:		1097°F (591.6°C)
Densities:		
Vapor (air = 1):		2.77
Liquid (water = 1):		0.899 at 20°C
Identifiers:		
U.N. number:		1114
CHRIS code:		BNZ
Cargo compatibility group:		32 (Aromatic hydrocarbons)
Regulations:		
Coast Guard		Subchapter O - 46 CFR
Department of Transportation		Subchapter C - 49 CFR
Environmental Protection Agency		40 CFR

Julie Mehta was a fourth class cadet at the Coast Guard Academy when this article was written as a special chemistry project for LCDR J.J. Kichner.

New publications *January-February 1992*

A 36-foot sportfisherman is a good example of classic wooden boat construction.

Boatbuilding Manual
Third Edition

A must for the bookshelf of any marine inspection office and an informative addition to any boatbuilder's library, the third edition of the *Boatbuilding Manual* by Robert M. Steward is a comprehensive text on vessel construction.

The first two editions were devoted primarily to the construction of traditional wooden vessels. However, the basic principles of construction outlined in the manual apply to more than wooden shipbuilding. The principles can be used in building tooling for fiberglass vessels, as well as the finishing of wood, fiberglass and composite vessels.

This newest edition (published in 1987) covers new techniques, materials and products, emphasizing wood and adhesives. This information is very timely in light of the new trends in plywood and fiberglass composite construction.

With its down-to-earth descriptions of long established, common techniques and methods of building boats, this manual can be picked up and used to advantage by any amateur boatbuilder. The readability of the *Boatbuilding Manual* makes it a valuable tool for T-boat inspectors when examining hulls or seeking guidance on the structural integrity of a vessel.

In addition, the manual features excellent drawings of construction details. One whole chapter is devoted to fastenings, and another to frames and framing techniques.

Robert Steward is well qualified to write authoritatively on boatbuilding. He has 50 years of work experience in design offices and for East and West Coast builders. He was a designer and engineer for 24 years for the Huckins Yacht Corporation.

The *Boatbuilding Manual* can be purchased for $29.95 from the International Marine Publishing Company, Camden, Maine 04843.

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Chemical of the Month Compilation
Descriptions of Selected Hazardous Materials Which May be Encountered During Marine Transportation

This 200-page booklet contains descriptions of 79 hazardous chemicals from acetaldehyde to xylene. Included are formulas, uses, hazards, precautions, properties and identifiers.

The chemical of the month column has been a regular feature in the *Proceedings of the Marine Safety Council* for more than ten years. The purpose of the column is to provide readable information on hazardous materials with which merchant mariners and Coast Guard personnel are likely to come in contact.

The feature was initiated by the former Hazards Evaluation Branch of the Office of Merchant Marine Safety to carry out the Coast Guard mission to disseminate chemical safety information.

The first chemical of the month column in 1980 dealt with anhydrous ammonia. Prepared by Dr. Alan Schneider and Mr. Curtis Payne, the article was prompted by an accident involving anhydrous ammonia that took the life of a member of the Coast Guard the previous year.

In 1981, it was decided that the column should be a regular feature in *Proceedings* as many merchant mariners welcomed understandable descriptions of hazardous materials. Later on, the effort was undertaken by cadets and faculty at the U.S. Coast Guard Academy, New London, Connecticut.

Preparation of these columns has been monitored by CDR T.J. Haas, CDR J.J. Kichner and LCDR T.J. Chuba. All data in this publication has been reviewed and updated.

Published in August 1991, the Compilation of the Chemical of the Month may be obtained for $35.00 (paper copy) and $17.000 (microfiche) by addressing:

PB91 - 236257
National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161
Telephone: 703-487-4028

The Boater's Medical Companion

Robert S. Gould, M.D., has prepared an excellent guide to handling medical emergencies at sea. Having *The Boater's Medical Companion* aboard can make any boater more confident in coping with a medical emergency afloat.

Special sections on using the radio and dealing with a medical evacuation could be very helpful to an inexperienced crew member faced with a disabled captain.

Designed for those who don't plan to go on bluewater cruises, but who need to know how to deal with emergencies on board – and to decide whether a problem is a real emergency -- this guide is clear and explicit.

A physician for 25 years and a sailor/explorer for 20 years, Dr. Gould spices his data with anecdotes from his own adventures.

Published in 1990, *The Boater's Medical Companion* can be obtained for $6.95 from Cornell Maritime Press, P.O. Box 456, Centreville, Maryland 21617.

The Boater's Weather Guide

Sooner or later everyone who ventures out on the water will encounter strong winds and confused seas, fog, thunderstorms or heavy rain. How dangerous any of these situations will be depends not only on the type of boat, but also on the experience and knowledge of those aboard. The weatherwise mariner has planned how to cope with bad weather, and has learned how to read the signs in the sky and on the water.

Published in 1991, *The Boater's Weather Guide* by Ms. Margaret Williams, a free-lance writer of technical boating subjects, acquaints boaters with the forces that shape weather and allows them to predict changes that can be expected.

Part I contains a logical explanation of climate and weather, concentrating on wind speed and direction, low visibility, thunderstorms, gales and hurricanes, the elements that affect the mariner the most.

The second part deals with the effects of climate and weather on the boater without delving into the whys and wherefores -- a practical approach for those who want only the necessary facts.

The Boater's Weather Guide can be purchased for $7.95 from Cornell Maritime Press, P.O. Box 456, Centreville, Maryland 21617.

Final rule

CGD 91-039, Closure of vessel documentation office, Honolulu (46 CFR part 67) (October 15).

After a review of its field organization for vessel documentation, the Coast Guard is closing the documentation office at Marine Safety Office (MSO) Honolulu, Hawaii, and will transfer the duties of that office to the one at MSO Puget Sound in Seattle, Washington. Closure of the Honolulu office is necessary because an evaluation of the workload in the Pacific area indicates that the Coast Guard can serve the public more quickly and efficiently by combining the workload and staff of the Seattle and Honolulu offices. This final rule publishes that closure, which will allow the Coast Guard to serve the public more effectively. It also reflects the realignment of Coast Guard districts four years ago.

Effective date: January 1, 1992.

Addresses: The executive secretary, Marine Safety Council (G-LRA-2, 3406) (CGD 91-039), Coast Guard headquarters, 2100 Second Street, S.W., Washington, D.C. 20593-0001, maintains the public docket for this rulemaking. This docket will be available for inspection or copying at room 3406 at the above address between 8 a.m. and 3 p.m., Monday through Friday, except federal holidays. Telephone: (202) 267-1477.

For further information, contact: Mr. Thomas L. Willis, chief, Vessel Documentation and Tonnage Survey Branch, Office of Marine Safety, Security and Environmental Protection. Telephone: (202) 267-1492.

Temporary rule notice

CGD 91-051, Safety and security zones (33 CFR parts 100 and 165) (October 17).

The published list gives notice of temporary safety zones, security zones and special local regulations for limited periods of time in limited areas. Safety zones are established around areas where there has been a marine casualty or when a vessel carrying a particularly hazardous cargo is transiting a restricted or congested area. Special local regulations are issued to assure the safety of participants and spectators of regattas and other marine events.

Dates: The list includes safety and security zones, and special local regulations established between July 1, 1991, and September 30, 1991, and have since been terminated. Also included are several zones established earlier, but inadvertently omitted from the past published list.

Addresses: The complete text of any temporary regulations may be examined at, and is available on request, from the executive secretary, Marine Safety Council (G-LRA-2), Coast Guard headquarters.

For further information, contact: Mr. Don Harris, regulatory paralegal, Marine Safety Council at (202) 267-1477 between the hours of 8 a.m. and 3:30 p.m. Monday through Friday.

Final rule

CGD 88-040, Benzene (46 CFR parts 30, 151, 153 and 197) RIN 2115-AD08 (October 17).

The Coast Guard is amending its regulations by revising the special carriage requirements for benzene and benzene mixtures, and by adding new regulations concerning occupational exposure to benzene vapor on vessels.

Exposure to benzene vapors can cause leukemia or other serious blood disorders. The rule reduces permissible exposure limits and provides the same level of protection for workers exposed to benzene vapor in the marine workplace as factory workers have under the Occupational Safety and Health Administration's regulations.

The rule's requirements are performance-oriented and can be met by changes in work practices, and the use of respirators, and other

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protective clothing and equipment. The rule also requires the training of workers and testing of employees to determine benzene exposures.

Because benzene generally produces warning signs in the body before the onset of cancer, the rule provides for medical examinations of workers. Those workers with benzene-caused medical problems are forbidden from working in a benzene environment. Deadlines have been established for compliance with each of the safety requirements.

It should be noted here that the final rule inadvertently changed the entries in Table 151.05 and Table 1 of part 153 in Title 46 from 10 percent to .5 percent benzene. The intent of the rulemaking was not to change the carriage requirements for those products with a benzene content of .5 percent to 10 percent, but to have a way to refer the reader to the safety and health requirements of 46 CFR part 197. A correction rule is in clearance to change these entries back to the proper 10 percent benzene and to add footnotes to the two tables to link 46 CFR part 197 for products with benzene contents between .5 percent and 10 percent.

Effective date: January 15, 1992.

For further information, contact: Dr. Alan L. Schneider, Hazardous Materials Branch, Office of Marine Safety, Security and Environmental Protection. Telephone: (202) 267-1217.

Request for comments

CGD 91-054, Review of boating safety regulations (33 CFR parts 95, 100, 173, 174, 175, 177, 179, 181 and 183: 46 CFR part 25) (November 1).

The Coast Guard will conduct a comprehensive review of currently effective boating safety regulations at the May 1992 meeting of the National Boating Safety Advisory Council (NBSAC). The purpose of the review is to determine if any of the Coast Guard boating safety regulations are in need of change or revision. This notice describes the existing regulations that will be reviewed and solicits comments from the boating public in response to specific questions related to the review.

The Coast Guard will provide a summary of the comments received to the NBSAC members for their consideration before the May meeting, and will consider all relevant comments in forming changes to the regulations.

Date: Comments were requested by December 31, 1991.

Addresses: Comments may be mailed to the executive secretary, Marine Safety Council (G-LRA-2/room 3406), Coast Guard headquarters or delivered to room 3406 between 8 a.m. to 3 p.m., Monday through Friday, except federal holidays. Telephone: (202) 267-1477.

The executive secretary maintains the public docket for this regulatory review project. Comments will become part of this docket and will be available for inspection or copying at room 3406, Coast Guard headquarters.

For further information, contact: Mr. [illegible] Perry, regulatory coordinator, Auxiliary, Boating and Consumer Affairs Division. Telephone: (202) 267-0979.

Advance rule notice

CGD 91-045, Structural and operational measures to reduce oil spills from existing tank vessels without double hulls (33 CFR part 157; 46 CFR parts 31, 32, 35) RIN 2115-AE01 (November 1).

The Coast Guard is soliciting comments on which structural and operational measures should be required for existing tank vessels without double hulls to provide as substantial protection to the environment as is economically and technologically feasible. Regulations requiring structural and operational measures which meet this standard of protection are mandated by the Oil Pollution Act of 1990 (OPA 90).

The purpose of such regulations is to reduce the likelihood as well as the impact from oil spills during the statutory phaseout period established by the separate requirement of OPA 90 that all tank vessels be equipped with double hulls, at the latest, by the year 2015. The Coast Guard is soliciting comments also on whether existing tank vessels should be required to install double hulls sooner than set out in OPA 90.

Date: Comments were requested by December 31, 1991.

Addresses: Comments must be submitted in writing and may be mailed to the executive secretary, Marine Safety Council (G-LRA-2/room 3406), Coast Guard headquarters or delivered to room 3406 between 8 a.m. to 3 p.m., Monday through Friday, except federal holidays. Telephone: (202) 267-1477.

The executive secretary maintains the public docket for this regulatory review project. Comments will become part of this docket and will be available for inspection or copying at room 3406, Coast Guard headquarters.

A copy of the report by the National Academy of Sciences, titled *Tanker Spills: Prevention by Design* is in the public docket and may be reviewed and copied at the same time in room 3406. It also may be purchased from the National Academy Press, 2101 Constitution Avenue N.W., P.O. Box 285, Washington, D.C. 20055. To order by phone, call toll-free 1-800-624-6242, or call (202) 334-3313 in the Washington metropolitan area.

The docket also contains a copy of Coast Guard NVIC No. 1-90 and IMO Resolution A. 647(16).

For further information, contact: Mr. Thomas L. Neyhart, project manager, OPA 90 staff, (G-MS-1). Telephone (202) 267-6743, between 8 a.m. and 4 p.m., Monday through Friday, except federal holidays.

Notice of intent

CGD 91-026, Central Pacific Loran-C chain closure (November 5).

On June 3, 1991, the Coast Guard published a notice of intent and request for comments (56 FR 25151) to propose early closure of the Central Pacific Loran-C chain, rate 4990. The Coast Guard intends to terminate the Loran-C service provided by the Central Pacific Loran-C chain in the Hawaiian Islands on December 30, 1992, in lieu of continuing operations until December 31, 1994. Continued operation of the central Pacific Loran-C chain is not economically justified. Early closure of this Loran-C chain will save the Coast Guard the cost of operating it for two more years, amounting to an estimated savings of five to six million dollars.

The coverage provided by the satellite-based global positioning system (GPS) is increasing, while the cost of GPS receivers is decreasing. GPS presently provides coverage where Loran-C cannot and this coverage includes the Hawaiian Islands.

For further information, contact: CDR Richard Armstrong, chief, Radio Aids Management Branch (G-NRN-1), Coast Guard headquarters. Telephone: (202) 267-0990.

Notice of intent

CGD 91-034/90-068 Vessel response plans, and carriage and inspection of discharge-removal equipment (33 CFR part 155) RIN 2115-AD81 and 66 (November 29).

The Coast Guard is clarifying its notice of intent published November 18, 1991 (56 FR 58202) to form a negotiated rulemaking committee to develop portions of the regulations that are to be issued under OPA 90.

For further information, concerning the substantive aspects of oil spill response plans and the carriage of removal equipment for tank vessels, contact LCDR Glenn Wiltshire, project manager, OPA 90 staff at 202-267-6740 between 7 a.m. and 3:30 p.m., EST, Monday through Friday, except federal holidays.

Final rule

CGD 91-041, Pollution fund expenditures by district commanders (33 CFR part 153) (December 2).

The Coast Guard district commander's authority to expend funds from the pollution fund for removal costs related to a discharge of oil or hazardous substances is limited to $1,000,000. The procedure required to exceed the authorized limitation is an internal management step that unnecessarily delays removal action on a dis- charge. This rulemaking eliminates this limitation and makes several conforming amendments. These amendments concern internal agency procedure and are needed to expedite the process of removing oil or hazardous substances requiring over $1,000,000 in expenditures.

Effective date: December 2, 1991.

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For further information, contact: Mr. Allen R. Thuring, telephone (703) 235-4741, National Pollution Funds Center.

Proposed rule extension of comment period

CGD 91-005, Financial responsibility for water pollution (vessels) (33 CFR parts 130, 131, 132 and 137) RIN 2115-AD76 (December 2).

On September 26, 1991, the Coast Guard published a notice of proposed rulemaking on financial responsibility for vessels (56 FR 49006). The original comment period provided in that notice is extended an additional 60 days.

Dates: The comment period on this notice is extended to January 24, 1992.

Addresses: Comments may be mailed to the executive secretary, Marine Safety Council (G-LRA-2/3406) (CGD 91-005), U.S. Coast Guard headquarters, or may be delivered to room 3406 between 8 a.m. and 3 p.m., Monday through Friday, except federal holidays. The telephone number is (202) 267-1477.

Comments will become part of the public docket for this rulemaking and will be available for inspection or copying at room 3406, Coast Guard headquarters.

For further information, contact: Mr. Robert M. Skall, National Pollution Funds Center. Telephone: (703) 235-4704.

Proposed rule notice

CGD 89-104, Great Lakes pilotage rates (46 CFR part 401) RIN 2115-AD47 (December 6).

The Coast Guard is proposing to amend the Great Lakes pilotage regulations increasing the basic pilotage rates on an interim basis by nine percent in District 1, 21 percent in District 2 and 10 percent in District 3. These changes would temporarily increase the rates so that revenue received by the pilot organizations would be sufficient to increase pilot compensation, while a permanent rate methodology is being developed. The Coast Guard requests comments on this proposed rate increase.

DATE: Comments must be received on or before January 6, 1992.

Addresses: Comments may be mailed to the executive secretary, Marine Safety Council (G-LRA-2/3406) (CGD 89-104), U.S. Coast Guard headquarters, or may be delivered to room 3406 between 8 a.m. and 3 p.m., Monday through Friday, except federal holidays. The telephone number is (202) 267-1477.

The executive secretary maintains the public docket for this rulemaking. Comments will become part of this docket and will be available for inspection or copying at room 3406, Coast Guard headquarters.

For further information, contact: Mr. John J. Hartke, project manager, Office of Marine Safety, Security and Environmental Protection (G-MVP/12), room 1210, Coast Guard headquarters. Telephone: (202) 267-0217.

OPPOSITE PAGE --Winter takes its toll on small fishing boats. Seams open and overnight a boat can sink.

Photo taken off Cape Cod by William P. Quinn

FRONT COVER -- Coast Guard Cutter Key Largo escorts USNS Algol out of Savannah loaded with equipment bound for the Persian Gulf.

Photo by PAI Chuck Kalnbach