

Staff Report

NAVIGATIONAL SAFETY AND OIL SPILL PREVENTION IN SAN FRANCISCO BAY

May 4, 2001

SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION

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PREFACE

This report is written for the San Francisco Bay Conservation and Development Commission to provide it with background information on the subject of Navigational Safety and Oil Spill Prevention. The objective of the report is to highlight navigational safety and oil spill prevention issues that the Commission may want to address in its *San Francisco Bay Plan*.

The San Francisco Bay Conservation and Development Commission (BCDC) would like to thank the many state, federal and maritime organizations who helped in the development of this draft background report.

In early 2000, the first version of this report was circulated to a selected group of people with expertise in the maritime industry. Subsequent versions were reviewed by the BCDC Citizens Advisory Committee and BCDC staff. Many helpful comments and suggestions were also received on the early versions of the report by Chevron Shipping, the San Francisco Bar Pilots, the California Coastal Commission, the California State Lands Commission - Marine Facilities Division, the California Department of Fish and Game - Office of Spill Prevention and Response, and the United States Coast Guard.

In addition, BCDC would like to thank the many individuals associated with the Harbor Safety Committee of the San Francisco Bay Region and the United States Coast Guard's Area Planning Committee who provided invaluable advice during the preparation of this report. BCDC continues to welcome comments and suggestions on this draft background report as it is circulating during the public review period.

CONCLUSION AND RECOMMENDED CHANGES TO BAY PLAN FINDINGS AND POLICIES

Conclusion. San Francisco Bay is the region's most valuable natural asset. The Bay is used for navigation, commerce, recreation, wildlife, and provides for the general public welfare. In order to protect the Bay, high priority should be given to navigational safety, especially as it relates to the transit of petroleum and hazardous substances. An extensive regulatory framework currently exists to provide for navigational safety, spill prevention, and response. The San Francisco Bay Conservation and Development Commission (BCDC) can play an important role in this framework. Indeed, BCDC is charged by the Legislature to be involved in navigation and harbor safety through participation on the Harbor Safety Committee of the San Francisco Bay Region, and through the oil spill program administered under the California Department of Fish and Game - Office of Oil Spill Prevention and Response (OSPR). An amendment to the *San Francisco Bay Plan* (Bay Plan) that addresses navigation issues and that augments the institutional framework already in place is one way to fulfill the Commission's Bay protection responsibilities.

Many important navigation and harbor safety issues fall within the Commission's geographic jurisdiction. Shipping channels in shallow areas of the Bay must constantly be maintained to provide safe access for those ships upon which much of the Bay economy depends. Marine facilities should be structurally sound in order to prevent injury and protect against oil spill. Education regarding navigational safety in public access shoreline areas is an important way to enhance the safety of recreational boating. Updated and accessible information in electronic formats provides both a navigational safety and spill response tool.

In order to better protect the Bay's resources, all agencies concerned with navigational and harbor safety should work together to the greatest extent possible. Although many agencies currently deal with navigational safety, BCDC can enhance the Bay's protection by implementing similar goals in its coastal zone management program.

The overall effect of the proposed amendment to the Bay Plan would be an update of the plan so it recognizes: (1) the importance of navigational safety and oil spill prevention and (2) the existing agencies and organizations that have expertise in these fields. In addition, the proposed amendment would provide the Commission with clear policy guidance for evaluating proposed projects in the Bay or on the shoreline that could effect navigational safety and oil spill prevention. Lastly, the proposed amendment would help BCDC carry out the goals and objectives of the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act (OSPRA) and the McAteer-Petris Act that are aimed at protecting San Francisco Bay and its environment now and for future generations.

The staff is recommending that the Commission adopt a new finding and policy section of the Bay Plan entitled "Navigational Safety and Oil Spill Prevention," and revise existing findings and policies concerning dredging,

recreation, transportation and safety of fills to incorporate language that promotes navigational safety and oil spill prevention in San Francisco Bay. The additions proposed to the existing findings and policies are underlined in the following text and the proposed deletions are ~~struck through~~.

New Bay Plan Findings and Policies on Navigational Safety and Oil Spill Prevention

Findings

- a. San Francisco Bay's location and unique geographical features create an attractive and important area for water-related industries. These industries rely on shipping for import, export and domestic distribution of petroleum products and other goods. Providing for safe navigation greatly enhances the region's water-related industries.
- b. Mariners operating in the Bay face difficult challenges such as increasing vessel traffic, physically restricted shipping lanes, frequent shoaling, rapid weather changes, fog, strong currents, and physical obstructions.
- c. Marine accidents that result in spills of hazardous materials, such as oil, can adversely affect a variety of Bay resources, including wildlife habitats, water quality, commercial and recreational fishing, recreation areas, businesses, and personal property. Strong currents and tides can cause spills to reach sensitive resources in a very short time. Spills of petroleum products in the Bay can devastate resident and migratory bird populations.
- d. San Francisco Bay has an outstanding navigational safety record because many state, federal and international agencies, organizations and businesses involved with maritime shipping actively participate in programs to improve safe navigation and to prevent marine accidents that could result in spills of hazardous materials, such as oil. The Harbor Safety Committee of the San Francisco Bay Region, composed of representatives from the maritime community, port authorities, pilots, tug operators, the United States Coast Guard, the Office of Spill Prevention and Response, the petroleum and shipping industries, and others with expertise in shipping and navigation, meets regularly to develop additional strategies to further safe navigation and oil spill prevention.
- e. The U.S. Coast Guard, which is empowered by federal law to meet its strategic goals of navigational safety and the protection of natural resources, uses its expertise and authority to regulate bridges and aids to navigation.
- f. San Francisco Bay is spanned by a number of fixed bridges tall enough to safely allow ship traffic under their spans. There are also drawbridges at the Carquinez Strait and Oakland Estuary. Bridges over navigable waterways may be equipped with navigation lights, clearance gauges, water level gauges, sound devices or radio beacons, all of which improve navigational safety and help prevent spills of hazardous materials, such as oil.
- g. There have been no pollution incidents in the Bay Area attributable to improper bridge location, pier placement,

navigational lighting, clearance gauges, protection systems or drawspan operation. The U. S. Coast Guard coordinates navigational and operational requirements on all bridge projects to ensure safety is maintained. Existing and proposed bridges are carefully evaluated for their ability to meet the reasonable needs of navigation prior to receiving a federal permit. Drawbridges operate under carefully tailored regulations to ensure safety and operational transportation needs are met.

- h. The waters of San Francisco Bay are marked with a system of buoys and beacons to assist navigation. These aids to navigation are water-oriented uses that provide a substantial safety and environmental benefit by helping prevent navigation accidents that could spill hazardous materials, such as oil.
- i. Physical obstructions located near shipping lanes, such as the underwater pinnacles located near the shipping lane north of Alcatraz Island, pose a navigation hazard for large, deep draft vessels and increase the risk of spills of hazardous materials, such as oil.
- j. Because of the changing marine conditions in San Francisco Bay, safe navigation is highly dependant upon accurate reports on the winds, tides and currents. The Physical Oceanographic Real Time System (PORTS) efficiently provides information on currents, water level, salinity, and other marine weather conditions that

are useful to mariners and oil spill response organizations.

- k. Communication is essential for safe navigation in heavily used port areas. The U.S. Coast Guard Vessel Traffic Service-San Francisco plays a vital role by promoting safe and orderly vessel traffic within San Francisco Bay through radio communications.
- l. Oil spill contingency plans and appropriate, easily accessible and strategically located spill response equipment are important parts of effective oil spill response strategies for San Francisco Bay. Marine facilities, which are used for exploring, drilling, producing, storing, handling, transferring, processing, refining or transporting oil and are located in or near marine waters, as defined in the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act, are required to have oil spill contingency plans pursuant to that Act.

Policies

- 1. Physical obstructions to safe navigation, as identified by the U.S. Coast Guard and the Harbor Safety Committee of the San Francisco Bay Region, should be removed to the maximum extent feasible when their removal would contribute to navigational safety and would not create significant adverse environmental impacts. Removal of obstructions should ensure that any detriments arising from a significant alteration of Bay habitats are clearly outweighed by the public and environmental

benefits of reducing the risk of spills of hazardous materials, such as oil.

2. The Commission should ensure that marine facility projects have oil spill contingency plans that have been approved by the Office of Spill Prevention and Response, the U.S. Coast Guard and other appropriate organizations.
3. To ensure navigational safety and help prevent accidents that could spill hazardous materials, such as oil, the Commission should encourage major marine facility owners and operators, the U. S. Army Corps of Engineers and the National Oceanic and Atmospheric Administration to conduct frequent, up-to-date surveys of major shipping channels, turning basins and berths used by deep draft vessels and oil barges. Additionally, the frequent, up-to-date surveys should be quickly provided to the U.S. Coast Guard Vessel Traffic Service-San Francisco, masters and pilots.

Proposed Revisions to Existing Findings and Policies

1. Dredging

Findings

- b. Dredging consists of excavating or extracting materials from the Bay. Dredging is often necessary to provide and maintain safe navigation channels and turning basins with adequate underkeel clearance, ~~and~~ harbors for port facilities, water-related industries, ~~and~~ recreational boating, and ~~for~~ flood control channels.

Policies

1. Dredging should be authorized when the Commission can find: (a) the applicant has demonstrated that the dredging is needed to serve a water-oriented use or other important public purpose, such as navigational safety; (b) the materials to be dredged meet the water quality requirements of the San Francisco Bay Regional Water Quality Controls Board; (c) important fisheries and Bay natural resources would be protected; and (d) the materials would be disposed in accordance with Policy 2.

2. Recreation

Findings

- h. Large, deep draft vessels are confined to restricted, and sometimes narrow, shipping lanes, which they sometimes share with other vessels, boats, and smaller recreational craft. Increased boater education on shipping lanes, U.S. Coast Guard rules for navigation, and safety guidelines for smaller recreational crafts, can reduce the risk of accidents.

Policies

11. Signs and other information regarding shipping lanes, U.S. Coast Guard rules for navigation, such as U.S. Coast Guard Rule 9, and safety guidelines for smaller recreational craft, should be provided at marinas, boat ramps, launch areas, personal

watercraft and recreational vessel rental establishments, and other recreational water craft use areas.

3. Transportation

Findings

- b. Primary ~~Until recently, primary emphasis in regional transportation in recent years~~ has been placed in freeways, which in some instances have been built on fill in the Bay because acceptable routes could not be found ashore. ~~Little~~ Compared to roads and bridges, ~~less~~ attention has been given in recent years to using the waters of the Bay for modern boat vessel transportation.
- f. Ferry boats and excursion boats account for the majority of all vessel trips in the Bay. This type of vessel traffic in the Bay is projected to increase. Most of the ferry routes cross shipping lanes.

Policies

1. The Bay represents an important great but, at present, little used resource for transportation within the region. New, types of faster barges vessels may be able to move trucks and freight passengers and cargo from point to point within the region at low cost and without adding to thereby reducing surface congestion. Also, a system of modern ferries (capable of high speeds with minimum noise and ~~waves wakes~~) may be able to provide service between major traffic generators (e.g., between downtowns, or between downtowns and airports) and

eventually to provide scheduled service from one end of the Bay to the other for both commuting and pleasure use. The Bay Plan maps indicate possible sites for commuter ferry terminals and shallow-draft ports.

4. Safety of Fills

Findings

3. Marine petroleum terminals can pose a risk to public health and safety and the environment and increase the risk of oil spills if allowed to deteriorate or become structurally unsound. The California State Lands Commission and the U.S. Coast Guard regularly monitor oil transfers at marine petroleum terminals. The California State Lands Commission also conducts inspections and reviews engineering analysis and design changes for rehabilitation and/or new construction. This oversight includes, but is not limited to, oil transfer equipment, all major structural components, moorings, mechanical and electrical systems, and fire detection and suppression systems, pursuant to California State Lands Commission and U.S. Coast Guard rules, regulations, guidelines and policies.

Policies

1. The Commission has appointed the Engineering Criteria Review Board consisting of geologists, civil engineers specializing in geotechnical and coastal engineering, structural engineers, and architects

Policies (con't.)

competent to and adequately empowered to: (a) establish and revise safety criteria for Bay fills and structures thereon; (b) review all except minor projects for the adequacy of their specific safety provisions, and make recommendations concerning these provisions; (c) prescribe an inspection system to assure placement and maintenance of fill according to approved designs; (d) with regard to inspections of marine petroleum terminals, make recommendations to the California State Lands Commission and the U.S. Coast Guard, which are responsible for regulating and inspecting these facilities; (e) coordinate with the California State Lands Commission on projects relating to marine petroleum terminal fills and structures to ensure compliance with other Bay Plan policies and the California State Lands Commission's rules, regulations, guidelines and policies; and ~~(d)~~ (f) gather, and make available performance data developed from specific projects. These activities would complement the functions of local building departments and local planning departments, none of which are presently staffed to provide soils inspections.

INTRODUCTION

Spills of oil and other hazardous materials in the Bay can damage property, endanger human safety, and adversely affect the environment. If a large spill occurs, even well prepared response initiatives could not prevent these possible effects. It is estimated that mechanical response measures rarely succeed in retrieving more than ten percent of spilled oil.¹ A spill the size of the Exxon Valdez disaster would pollute the entire Bay, probably shut down shipping and ferry transportation at least for some period of time, and severely damage the ecosystem.

The purpose of this report is to provide information on navigational safety and spill prevention in the San Francisco Bay to Commission members, staff, and other parties interested in protecting the Bay. The report addresses important navigational issues of relevance to the Commission with an emphasis on the unique problems associated with spills of oil and other hazardous materials caused by vessel accidents. Chapter 2 of the report relies principally on information from the San Francisco, San Pablo and Suisun Bays Harbor Safety Plan (Harbor Safety Plan) prepared by the Harbor Safety Committee of the San Francisco Bay region. (See Appendix A.) Should there be any ambiguities or conflicts between this background report and the Harbor Safety Plan, the latter shall prevail. The intent is that they are to be read in harmony. Discussions with various agencies, organizations, environmental groups, committees, and businesses helped define important issues. This background information provides a basis for updating the San Francisco Bay Plan (Bay Plan) to provide findings and policies regarding navigational safety and oil spill prevention in San Francisco Bay that will guide BCDC's exercise of its jurisdiction.

This report and the recommended findings and policies will not create an additional level of regulatory review for maritime projects. BCDC's existing laws, policies and regulations currently give the Commission regulatory authority over any proposed project that involves placing fill, extracting materials or making any substantial change in use of any water, land or structure in the Bay and in the 100-foot shoreline band (the land area just upland and parallel to the shoreline of the Bay). The intent of the proposed Bay Plan amendments is to ensure that the Commission and its staff have access to and use the latest information on navigational safety and oil spill prevention in any decisions they may make on activities proposed in or around San Francisco Bay.

Chapter 1 presents an overview of the important maritime aspects of San Francisco Bay, including geographic features, trends in maritime use, and navigational concerns. Chapter 2 discusses the important navigational safety and oil spill prevention issues in the Bay Area. Chapter 3 discusses the legal and institutional framework currently in place dealing with navigational safety, spill prevention, and response in San Francisco Bay. Chapter 4 defines BCDC's role within this framework and its responsibility concerning navigational safety and oil spill prevention.

¹ Pond, R.G., D.V. Aurand, and J.A. Kraly. *Ecological Risk Assessment Principles Applied to Oil Spill Response Planning in the San Francisco Bay* (2000) 1.

Oil Spills and San Francisco Bay. San Francisco Bay is the fifth busiest port in the United States in total ship calls and in deadweight tons.² Reflecting the trend in total U.S. commodities, a large percentage of the material shipped is petroleum. Chemical shipments are also substantial.³ Although popular, the Bay has a number of hazards to navigation, such as shallow waterways, narrow shipping lanes, vessel traffic, strong tides and currents, and bad weather.⁴ These hazards increase the risk of a navigation related accident within the Bay. Accidents that result in spills of hazardous materials can damage the environment, disrupt water use, and involve substantial remediation costs.

In the past thirty years there have been four major oil spills in the Bay Area. These spills were the result of four different causes and are not necessarily linked to navigational safety; however, they are all included here to illustrate the effects oil spills have had in and around San Francisco Bay. On January 18, 1971, the tankers Oregon Standard and Arizona Standard collided near the Golden Gate Bridge and an estimated 1,160,000 gallons of bunker fuel oil spilled into San Francisco Bay. Environmental damage was extensive and at least 4,000 seabirds were killed. The spill occurred at flood tide and the oil was initially carried northward. The ebb tide carried most of the oil out to sea. Most of the remaining oil was stranded on the North Shore of the San Francisco Peninsula.⁵

On October 31, 1984, a violent explosion on board the vessel Puerto Rican caused the ship to break in two, with the stern section eventually sinking. This incident occurred outside the Bay at the pilot station 15 miles east of the Farallon Islands. Corrosion had caused a pinhole leak in a tank containing caustic chemicals. The chemicals spilled into an adjacent void and reacted with the protective coating of that tank, generating hydrogen gas that ultimately exploded. Approximately 1 to 1.5 million gallons of bunker and lubricating oil spilled into the sea. For the first three days the oil moved south, away from land. On the third night the slick reversed course to the north, eventually encircling the Farallon Islands before finally washing ashore in Bodega Bay. In the Gulf of the Farallones, 1,310 oiled birds were recovered. Aerial surveys indicated that an additional 4,500 murres and auklets were probably killed. As many as 15 elephant seals were oiled with no reported fatalities.⁶

On April 22, 1988, about 400,000 gallons of crude oil were spilled into the San Francisco Bay from Shell Oil Company's refinery in Martinez, California. The oil coated many acres of wetlands. Pushed by winds and tides, the spill covered miles of shoreline and tidal sloughs. Oil slicks appeared throughout the Carquinez Strait, Suisun Bay, and San Pablo Bay, killing fish, birds, mammals, and affecting sport fishing and other recreation uses.

² U.S. Dept. of Transportation, Bureau of Transportation Statistics, Maritime Administration, U.S. Coast Guard, *Maritime Trade and Transportation*, BTS99-02 (1999) 24.

³ U.S. Dept. of Transportation, Bureau of Transportation Statistics, Maritime Administration, U.S. Coast Guard (1999) 14.

⁴ Harbor Safety Committee of the San Francisco Bay Region c/o Marine Exchange of the San Francisco Bay Region, *San Francisco, San Pablo and Suisun Bays Harbor Safety Plan* (1999) v.

⁵ Pond, et al. (2000) 9.

⁶ Pond, et al. (2000) 9.

On October 27, 1996, approximately 82,000 gallons of intermediate fuel oil was discharged from a ballast tank on board the motor vessel Cape Mohican. The vessel had just entered the San Francisco Drydock for repairs. Shipyard personnel opened a valve to the tank, resulting in the discharge of oil. The contents of the tank drained into the drydock and then into the Bay through the drydock gates. Of the 82,000 gallons discharged, approximately 8,000 to 10,000 gallons entered the Bay. Fifty oiled birds were captured and 110 were found dead.⁷

The combined oil spilled from these four incidents was about four million gallons over a thirty year period. In 1989, the Exxon Valdez alone spilled 10 million gallons into Prince William Sound. A spill of the size of the Exxon Valdez spill within the Bay would have devastating ecological consequences. Although experts are still working on how to properly model representative spill trajectories, most agree that no area of the Bay is completely safe from a large oil spill. A spill in open water may adversely affect aquatic mammals, waterfowl, and other marine species. Petroleum products that coalesce could sink, potentially damaging benthic organisms. Spills that wash into marsh or tidal lands could permanently damage vegetation.

Spills also affect human safety. Some petroleum products, as well as many other chemicals, are hazardous to human health. Volunteer workers and others who are close to a spill, risk injury from exposure to chemicals and toxic fumes. In some instances, affected areas must be blocked off to ensure public safety.

The cost associated with these spills is immense. Shortly after the Shell Oil spill, 15 federal, state, and local agencies asserted claims against Shell for damage to the natural environment. In April 1990, all of the claims were settled in a single, consolidated action in federal court. As part of the settlement, Shell paid \$10,838,000 into a newly-established Shell Trust Fund. Overall, Shell has paid almost \$30 million for clean-up costs, penalties, damages, reimbursements, studies, and other expenditures. The estimated cost for clean-up alone after the Cape Mohican spill was 10 million dollars.

While these incidents involved accidents that were beyond the scope and authority of the McAteer-Petris Act, the Bay's resources were adversely impacted. To protect the Bay's resources, navigational safety and oil spill prevention must be a top priority. Currently, a large framework of agencies and laws addresses navigational concerns and the transportation of hazardous materials. BCDC can still play an important role by adopting findings and policies into the Bay Plan that are beneficial to navigational safety and oil spill prevention and that support, are not duplicative, and do not conflict with other state and federal laws, regulations or policies.

⁷ Pond, et al. (2000) 10.

CHAPTER 1

Maritime Aspects of the San Francisco Bay Area

The Geography of San Francisco Bay. San Francisco Bay is a unique geographical area. It is the largest estuary on the Pacific Coast north of South America and south of Alaska⁸ with a shoreline, including sloughs and certain waterways, of approximately 1,000 miles. Sixty-five percent of the rainfall in California drains into rivers and creeks that feed the Bay.⁹ Because of its size and shelter from the open ocean, San Francisco Bay is one of the most important harbors in the world.

Despite its popularity as a harbor, San Francisco Bay is not without navigational hazards. Dangerous areas begin well outside the Bay entrance and continue to port terminals. Ships approaching San Francisco Bay do so along three designated approach lanes that converge into a traffic roundabout at the San Francisco Approach Lighted Horn Buoy about nine nautical miles outside Point Bonita.¹⁰ The infamous "Potato patch" shoal, a large semi-circular shoal created by sediment deposition from ebb tidal movement, marks the entrance to the channel leading to the Golden Gate. The shallowest point in these shoals is 23 feet below Mean Lower Low Water (MLLW). The depth just outside of the approach lane is approximately 35 feet below MLLW. From this point onward, large, deep draft vessels are confined to designated, dredged, and maintained shipping channels. Because most of the Bay is shallow, large vessels cannot leave these lanes without the risk of accidents (see Figure 1).

The Golden Gate channel is the only entrance to the Bay. The channel is narrow with steep sides and some of the strongest currents in the area. At flood stage, the average maximum current is about 3 knots. Average maximum ebb tide current is about 3.5 knots but has been known to reach more than 6.5 knots between Lime and Fort Points. These fast moving currents have scoured the channel to a depth of about 300 feet making it the deepest point in the Bay.¹¹ The Golden Gate Bridge spans the inlet, connecting San Francisco and Marin peninsulas. The supports have fendering to reduce damage from possible collisions. Lights at both supports and in the middle of the span provide information about their location. In 1995, a radar-beacon (RACON) was installed to mark the center between the two towers.

The Golden Gate channel opens into central San Francisco Bay, the area north of the Bay Bridge and south of the Richmond-San Rafael Bridge. Because of the difficulty in maneuvering in narrow shipping channels, the entire Central Bay out to Point Bonita is a required "tug escort zone" for larger tanker vessels. Right now, only petroleum tankers are required to be escorted by tugs. The Vessel Traffic Service (VTS), operated by the U.S. Coast Guard, coordinates safe and

⁸ Coastal Crosslinks, Integrating Support for Maritime Commerce and Coastal Management, National Ocean Service. Pg. 4.

⁹ Navigation and Harbor Safety, Background Report for Seaport Plan. Pg. 20.

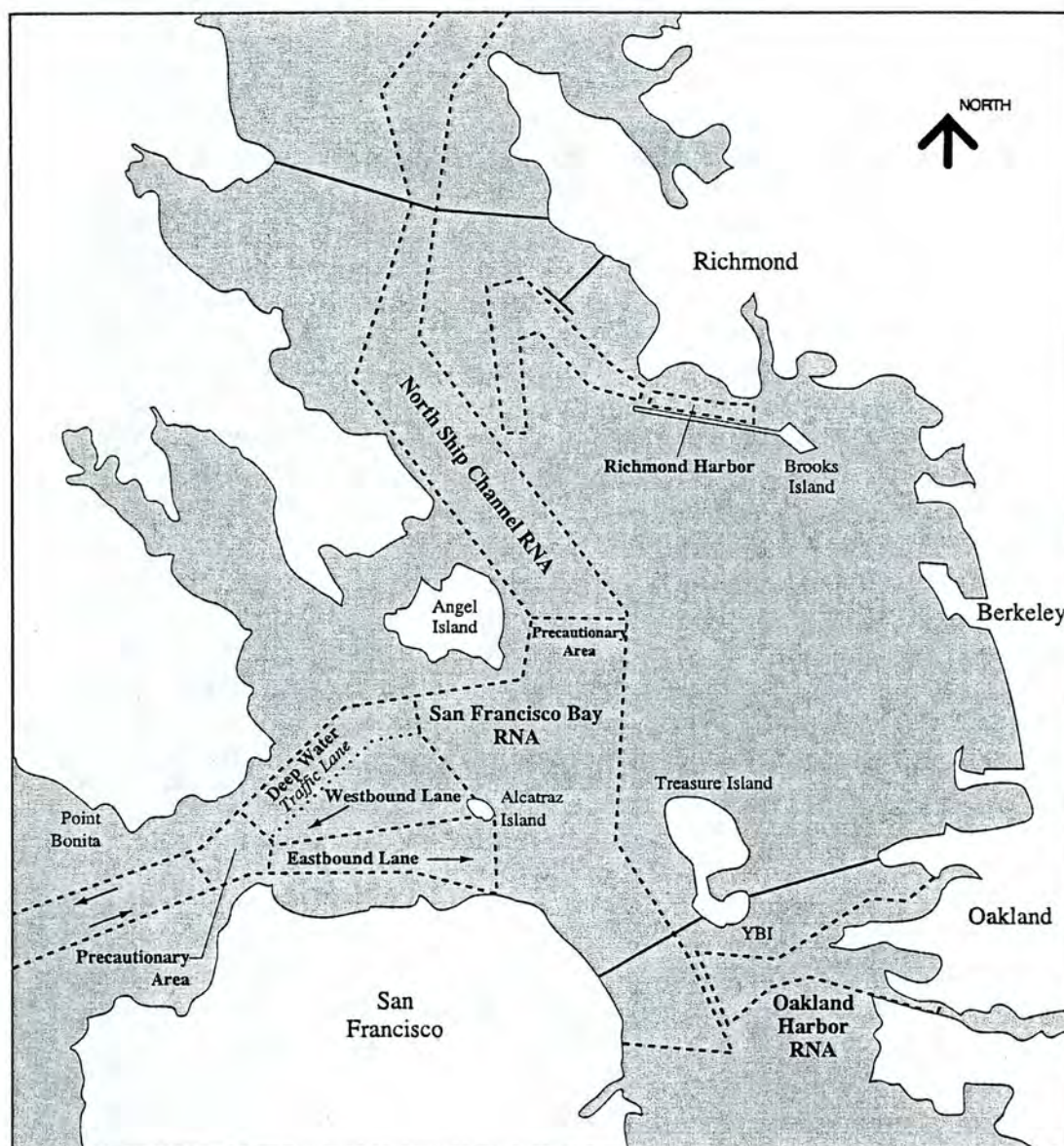
¹⁰ Harbor Safety Committee (1999) I-1.

¹¹ Harbor Safety Committee (1999) II-3.

Figure 1

SOURCE: Marine Exchange

Regulated Navigation Areas



Regulated Navigation Area (RNAs), designated shipping lanes, and Precautionary Areas in the Central Bay are shown above. The Central Bay is also the most popular recreational use area in the Bay and is used by passenger ferries and cruises. The U.S. Coast Guard Vessel Traffic Service (VTS) provides information to mariners to promote the safe and orderly flow of traffic in this area.

efficient transit of vessels in the Bay and provides radar coverage for all areas in the Central Bay other than Richardson Bay.¹² The shorelines in Marin County, the East Bay, and the San Francisco Waterfront contain a number of recreation areas, marinas, ferry terminals, and other water-oriented uses. Major marine terminals in this area include the Port of Richmond and the Chevron Long Wharf. The Castro Rocks, just north of the Long Wharf, are an important harbor seal habitat. The U.S. Coast Guard's Area Contingency Plan (ACP)¹³ designates approximately twenty environmentally sensitive areas in the central Bay.

Harding, Shag, and Arch rocks obstruct navigation between Alcatraz and Angel Islands. Deep draft vessels are not allowed to pass through part of this area because of the danger from the underwater pinnacles. There is also a dredged material disposal mound just south of Alcatraz that reduces water depth and is managed to control its growth towards the surface.

The South Bay, which begins just south of the Bay Bridge, has a large surface area but a relatively shallow average depth. Designated anchorage areas provide a place for vessels to moor for ship-to-ship transfer of petroleum products, the most common being General Anchorage No. 9 (see Figure 2). The Port of Oakland is the most vital non-tanker shipping port in the area. Oakland's port, along with other ports such as Redwood City in the south, require significant dredging. The extensive marshland habitat in the South Bay attracts many aquatic bird species and several endangered species. Because of its importance, the southernmost extent of South Bay is part of the Don Edwards San Francisco Bay National Wildlife Refuge. The ACP identifies approximately 28 environmentally sensitive sites in the South Bay.

San Pablo Bay is subject to high sedimentation rates from rivers, sloughs, tidal action, and land runoff. In many places outside the shipping channel, the depth of the water is less than 6 feet. Although the Army Corps of Engineers regularly dredges the shipping lanes, Pinole Shoal is one of the fastest changing underwater environments. Although there are many industrial areas, such as the former Mare Island Naval Shipyard and the Vallejo water-related industrial area in Solano County, and several oil refineries on the Contra Costa and Solano shorelines, a large amount of land in San Pablo Bay is either wildlife refuge or diked wetlands. This area also includes the San Pablo Bay National Wildlife Refuge. The ACP identifies approximately 14 environmentally sensitive sites in San Pablo Bay.

The Suisun Bay is bordered by the Grizzly Island Wildlife Area and other areas managed for waterfowl habitat. Port and water-related industries include the Concord Naval Weapons Station (currently a U. S. Army facility) and the U.S.

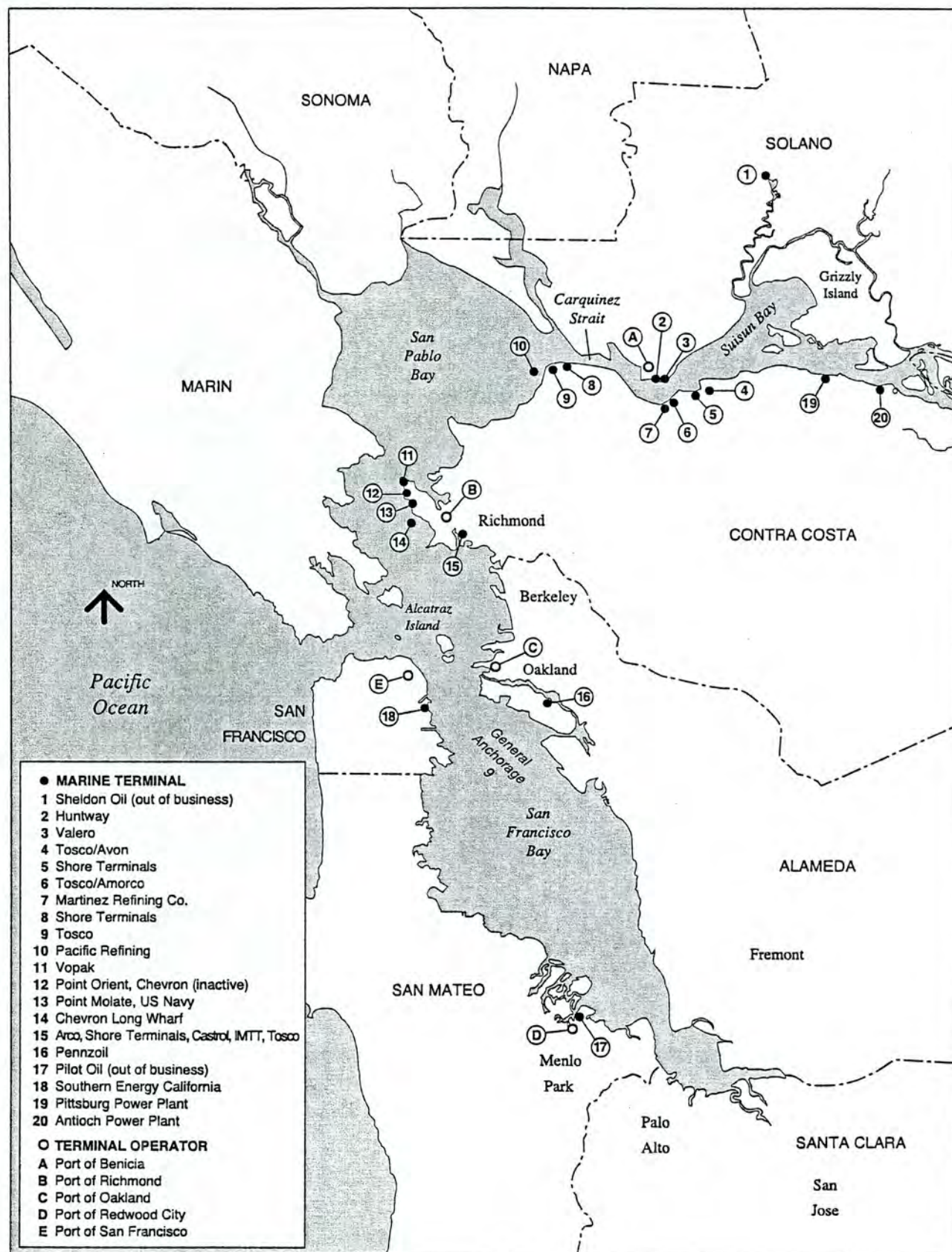
¹² Harbor Safety Committee (1999) Map 3.

¹³ United States Coast Guard, Marine Safety Office San Francisco Bay, *Area Contingency Plan for the California North Coast, San Francisco Bay & Delta, and the Central Coast*
<<http://www.uscg.mil/D11/msosf/dprtmnts/plan/acp+.htm>> (last modified Feb. 11, 2000).

Figure 2

SOURCE: Joint California Coastal Commission/BCDC Oil Spill Program

**Bay Area Marine Oil Terminals
and Anchorage 9**



Maritime Administration (MARAD) reserve fleet. Adjacent to the diked managed wetlands are several areas of well developed tidal marsh. The Suisun Marsh Protection Act provides specific legislative goals for preservation of the Suisun Marsh. The ACP identifies approximately 24 environmentally sensitive sites in the Suisun Bay area.

Connecting San Pablo and Suisun Bays is the Carquinez Strait. As shown on Figure 2, many of the oil refineries and marine terminals are located on the shores of the Strait. The Strait poses some of the most dangerous navigation problems for large ships in the Bay. It is extremely narrow and is spanned by four bridges. More bridges are planned for the future. The Union Pacific Railroad Bridge, a drawbridge over the Strait, can present dangers if not operated properly. Several problems with the bridge have occurred in the past. Because of bridges, shallow shipping lanes, shoaling, strong tides and currents, the Carquinez Strait is a major area of concern for navigators.

Ship traffic may continue further east beyond Suisun Bay traveling to the Ports of Sacramento and Stockton or to two power plants located near the communities of Pittsburg and Antioch. These power plants are currently using natural gas as fuel. The Pittsburg facility has not had a bulk liquid transfer from a vessel in 4 to 5 years. The facility in Antioch is in caretaker status, which means its systems have been disabled and it cannot transfer fuels. To resume operations there, permission from the U.S. Coast Guard, the California Department of Fish and Game – Office of Spill Prevention and Response, and the California State Lands Commission would be needed. In addition to oil, some of the vessels traveling beyond Suisun Bay carry hazardous chemicals.

Fish and Wildlife. BCDC was established to protect Bay resources, to ensure the benefits of fish and wildlife in the Bay for present and future generations, and to protect important habitats.¹⁴

The marshlands, mudflats, and open water of San Francisco Bay Estuary provide essential fish and wildlife habitat--food, water, shelter and other benefits--for over 500 species of fish, amphibians, reptiles, birds, and mammals. Twenty of these species are threatened or endangered with extinction. In addition, there are almost as many invertebrate species in the ecosystem as all other animals combined, bringing the total number of species that use the Estuary to over 1,000.¹⁵ The over one million birds that use the Pacific Flyway need the estuary as a nesting, feeding, and wintering habitat. Just outside the Golden Gate, several marine sanctuaries cover some of the most productive coastal waters in the world.

Spilled oil and certain cleanup operations can threaten different types of marine habitats. In shallow waters, oil may harm underwater vegetation, such as eel grass beds, that is used for food, shelter, and nesting sites. Open water areas affected by spills impact diving birds, dabbling or rafting ducks, and other birds

¹⁴ See *San Francisco Bay Plan (1969 as amended)*.

¹⁵ U.S. Environmental Protection Agency, San Francisco, Calif./S.F. Bay Regional Water Quality Control Board, Oakland, Calif., Goals Project, *Baylands Ecosystem Habitat Goals: A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project (1999)* 1.

that swim in open water to get prey. In tidal flats, deposited oil may seep into the muddy bottoms, creating potentially harmful effects on the ecology of the area and adversely impacting shorebirds. Salt marshes, particularly their root systems, are easily damaged by fresh light oils.¹⁶ The especially persistent nature of oil in wetland areas results in slow or no recovery from spill damage.

In open water, marine organisms such as fish and whales have the ability to swim away from a spill by going deeper in the water and farther away from a spill, reducing the likelihood of harm. Marine animals which generally live closer to shore, such as seals, waterfowl and shorebirds, risk contamination by oil that washes onto beaches or by consuming oil-contaminated prey. When fur or feathers come into contact with oil, they become matted, causing them to lose their insulating properties, and placing animals at risk of hypothermia. As the complex structure of the feathers that allows birds to float becomes damaged, the risk of drowning increases. Some species are susceptible to the toxic effects of inhaled oil. Oil vapors can cause damage to an animal's central nervous system, liver, and lungs. Ingesting oil can reduce the animal's ability to eat or digest its food by damaging cells in the intestinal tract. Some studies show long-term reproductive problems associated with oil exposure.¹⁷

Trends in Maritime Uses. The U.S. Coast Guard and the California Department of Fish and Game – Office of Spill Prevention and Response have designated the San Francisco Bay as a "higher volume port area" indicating the high level of vessel traffic and volume of materials shipped.¹⁸ Over the last 25 years, between 3,000 and 4,000 ships have called on San Francisco Bay every year.¹⁹ This figure does not include departures and in-Bay shifts; hence, the total ship movements in the Bay per year is more than twice this number. The USCG San Francisco VTS coordinates as many as 93,000 vessel movements each year, a vast majority of which are ferry trips. Petroleum tankers account for approximately one-quarter of all vessel arrivals. Container transport is also important in San Francisco Bay. (See Figure 3.) About 291 million barrels of oil are transferred in the Bay area each year. Monthly transfer totals reach as high as 67.7 million barrels.²⁰ Oakland, alone, ranked sixth in volume of U.S. waterborne container trade in 1997.²¹

Oil trade and container shipping are not the only maritime industries in the Bay. Commercial fishing, specifically for herring, plays an important role in Bay culture and has one of the longest histories of water-oriented use in the area. In addition, many people pay for recreational fishing trips for the chance to catch larger fish, such as salmon, sturgeon, and striped bass.

¹⁶ U.S. Environmental Protection Agency ("EPA"), *Oil Spill Program, Learning Center* <<http://www.epa.gov/oilspill/impacts.htm>> (last modified March 1, 1999).

¹⁷ U.S. Environmental Protection Agency, *Oil Spill Program, Learning Center*.

¹⁸ Pond, et al. (2000) 9.

¹⁹ Marine Exchange of the San Francisco Bay Region, *Golden Gate Ship Traffic* (1991-1999).

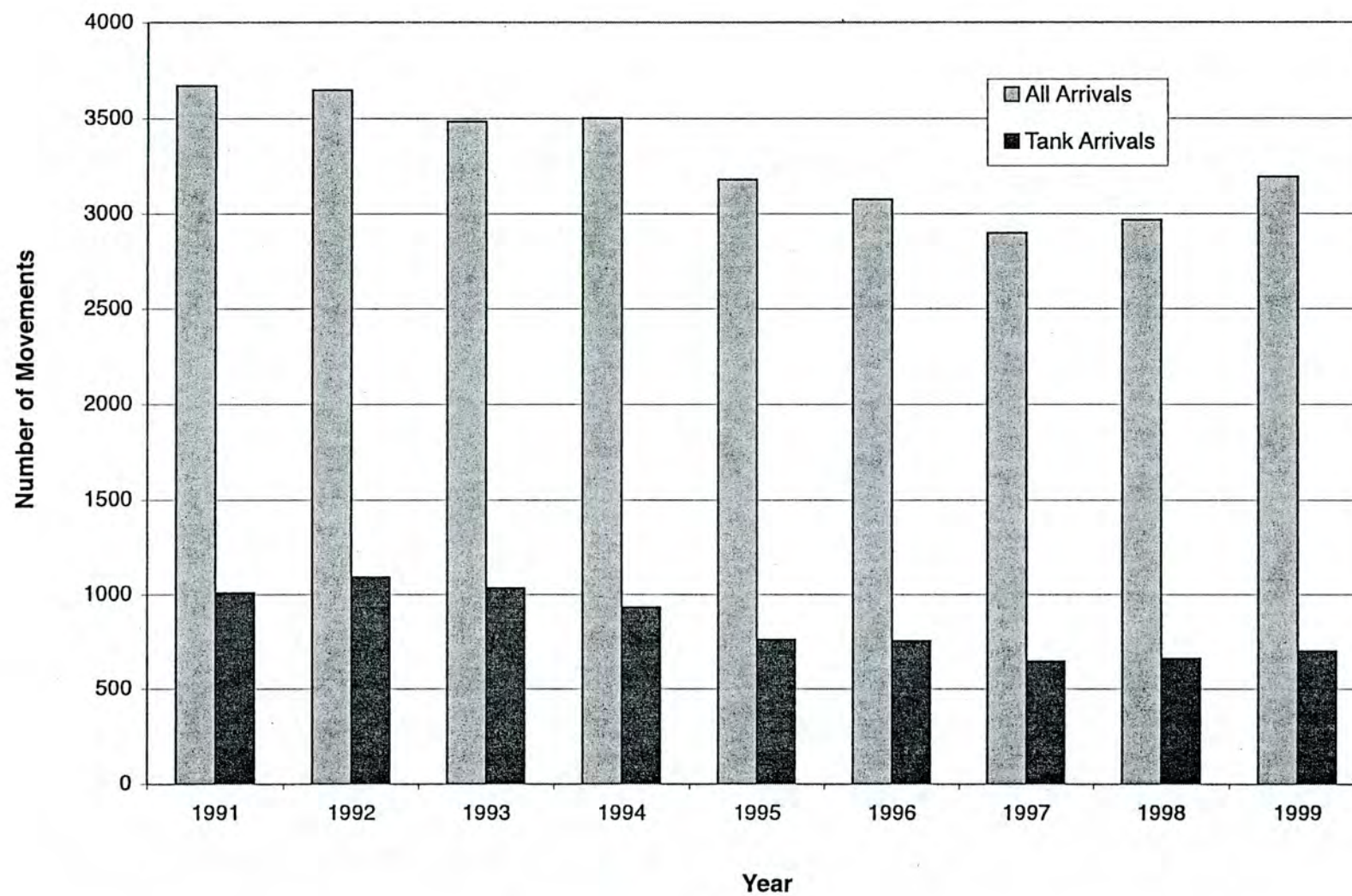
²⁰ Pond, et al. (2000) 9.

²¹ U.S. Dept. of Transportation, Bureau of Transportation Statistics, Maritime Administration, U.S. Coast Guard (1999) 26.

Figure 3

SOURCE: Marine Exchange

Ship Traffic Arrivals Per Year



A significant number of recreational boaters use the Bay, sometimes participating in regattas and other races. Also common are small sailboaters, kayakers, jet skiers, and board sailors. On any given day, several hundred commercial and recreational craft may share Bay waters. Using the Bay as an alternative to surface transportation has become increasingly popular because of overcrowded bridges and highways. Ferries currently connect Vallejo, the East Bay, Marin, and San Francisco.

CHAPTER 2

Navigational Safety and Spill Prevention Issues

The San Francisco Bay is among the country's most complex waterways. Strong currents, vessel traffic, and bad weather contribute to the already challenging task of maneuvering large ships in narrow shipping channels. However, large vessel traffic is an integral part of Northern California's economy. Industry experts estimate that shipping provides approximately 100,000 jobs in the Bay area and contributes over four billion dollars to the regional economy.²² A large percentage of materials shipped are petroleum or other chemical products. The Bay Area's environmental, ecological and economic health depends on the safe transportation of these materials. Because of the Bay's many recreational users, industry, and sensitive environmental resources, navigational safety and oil spill prevention are important components of Bay planning.

There are many navigational safety and spill prevention issues in the Bay. This chapter discusses only those issues of relevance to the Commission. Vessels are at risk from physical obstructions, such as underwater rocks, shoals, and congested shipping lanes. Spill risks are associated with oil transfer and marine petroleum terminals. Between 1992 and 1998 there was an average of approximately 60 vessel reportable marine casualties²³ a year in San Francisco Bay.²⁴ Not all of these casualties result in a vessel accident or spill. In most categories, recent figures show the number of vessel casualties are going down indicating an improving trend (see Figure 4). In addition to the documented vessel casualties, there are other incidents commonly referred to as "near misses."²⁵ Many other incidents go unreported. Despite these dangers, experts predict that commercial, and recreational vessel traffic in the Bay will only increase in the future. The devastation inherent in a serious ship accident mandates that accident free navigation is the only acceptable safety goal.

Issues for Vessels Underway

1. **Dredging.** Continuous dredging is needed to make deep-draft navigation possible in the Bay. In some areas, like the Central Bay, navigational channels are being made even deeper to accommodate the newer larger ships. Most dredging in the Bay is conducted by the Army Corps of Engineers and Bay Area ports. The Corps dredges about 40 percent of the total material removed each year.

Navigation channels in the Bay are narrow and subject to high sedimentation rates. Deep draft vessels "must carefully navigate many of the main shipping channels because channel depths in some areas are just

²² Harbor Safety Committee (1999) v.

²³ 46 C.F.R. § 4.05-1 (1999).

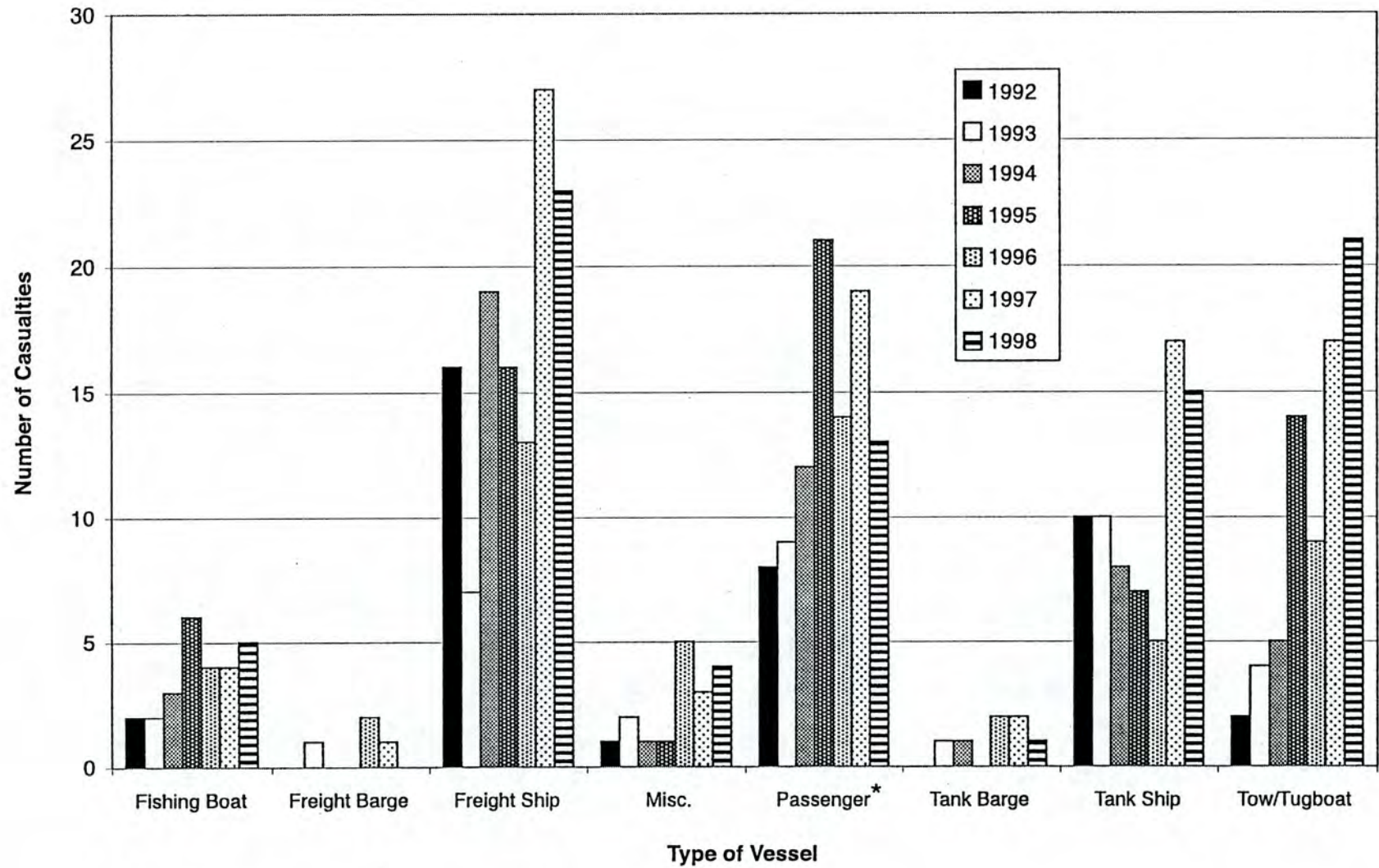
²⁴ Harbor Safety Committee (1999) Appendix b.

²⁵ An International Maritime Information Safety System (IMISS) is currently being developed to better record and utilize information on "near misses".

Figure 4

SOURCE: S.F. Marine Safety Office

Casualty Count on Vessels



* Note: Passenger vessels also include ferries and cruise vessels.

sufficient for navigation by some of the modern larger vessels."²⁶ Maintaining an adequate underkeel clearance in shipping channels helps reduce the risk of grounding. Approximately 2.7 million cubic yards of sediment have been removed from harbors and navigation channels each year over the last ten years. Maneuvering deep-draft ships in channels with marginal or unknown depths poses a navigation hazard. The Harbor Safety Plan recommends that heavily traveled navigation lanes subject to rapid shoaling, such as the areas east of Alcatraz and west of the Oakland Harbor, should receive frequent and updated soundings and that the Corps and NOAA should devise a system to quickly alert the U.S. Coast Guard's Vessel Traffic Service (VTS) and masters and pilots of their condition.^{27,28} The recommendation is made to the affected federal agencies and, to date, the state and the Harbor Safety Committee have yet to convince these federal agencies to follow through on this recommendation. In order to prevent the risk of accidents, dredging must be done as soon after problem areas are identified as possible.

Until recently, most of the sediment dredged from San Francisco Bay has been disposed at a site just south of Alcatraz Island. After the Corps discovered that the material did not disperse as predicted, resulting in a mound, they have closely monitored and regulated the site to prevent navigation risks. Some concern focuses on the possibility of future shoaling in other areas due to this mound. Because of its proximity to the surface, future dredging of the mound may be needed for navigational safety as was previously proposed.

The disposal of dredged material is an important part of Bay management. Historically, a majority of dredged material from the Bay has been disposed at federally-designated sites in the Bay. In order to "conduct necessary dredging and dredged material disposal in an environmentally sound and economically prudent manner" and to "maximize the 'beneficial reuse' of material," a partnership among federal and state agencies, navigation interests, fishing groups, environmental organizations, and the public created the Long-Term-Management-Strategy (LTMS).²⁹ Years of environmental research and evaluation of management plan alternatives has resulted in the selection of a strategy involving both ocean disposal and beneficial reuse. This alternative provides the greatest protection of Bay resources while economically providing for projected dredging volumes. BCDL is one of the primary LTMS agencies and is currently helping to prepare the LTMS Management Plan which will provide specific direction as to how the program's objectives can ultimately be achieved.

²⁶ Harbor Safety Committee (1999.)

²⁷ Harbor Safety Committee (1999) v-1.

²⁸ Harbor Safety Committee (1999) Recommendation V.2 and 3.

²⁹ Long Term Management Strategy (LTMS) for the Placement of Dredged Material in the San Francisco Bay Region. Policy Environmental Impact Statement/Programmatic Environmental Impact Report. Army Corps of Engineers, et al. Pg. 1-1.

2. **Underwater Rocks.** The Harbor Safety Committee has identified Harding, Arch, and Shag Rocks as major navigation hazards near the shipping lane northwest of Alcatraz Island. These rocks extend to within 33 feet of the Bay's surface at MLLW and are very close to navigation channels. The risk from these underwater rocks affects only the deepest draft ships such as laden tankers and the larger container ships. This hazard was one of the reasons the tug escort regulations were enacted in San Francisco Bay. However, only laden tankers are required to have tug escorts right now. At the Pilot and Master's discretion, shallower draft inbound vessels travel south of Alcatraz. Deep-draft inbound and outbound vessels sail north of Alcatraz to take advantage of deeper waters. In a 1992 study, the U.S. Coast Guard declared that the proximity of deep draft vessels sailing north of Alcatraz Island, to the Harding, Arch and Shag Rocks, is a navigational hazard.

Although the tops of the rocks were lowered in the past (circa 1940), the Harbor Safety Committee recommends that they should be lowered to 55 feet below the surface and that the two-way navigation lane north of Alcatraz be reconfigured.³⁰ The Army Corps of Engineers and California State Lands Commission are currently conducting a feasibility study regarding rock removal. If the Corps and State Lands determine that the rocks should and could be lowered in an environmentally sound manner, approval from BCDC would be needed to undertake the project. Removal of these rocks would significantly reduce the risk of large vessel grounding and, therefore, reduce the risk of oil spill.

3. **Turning Basins.** Turning basins are essential for navigating large ships in and around the Bay's major ports and terminals. These deepened areas provide a place for large vessels to turn safely. If sufficiently large, these areas can provide an emergency "turn out" for ships in the event of a drawbridge malfunction or problems with an oncoming vessel. Large tank vessel operators have voiced their concern about the lack of turning basins for ships in the Carquinez Strait at recent Harbor Safety Committee meetings. Because of the narrow shipping channel width, tank ships leaving their berths may not have adequate room to turn causing some to leave the designated dredged shipping lanes. This increases the possibility of a ship running aground. A grounded ship will be unable to maneuver and, in extreme cases, could suffer structural damage or rupture. A turning basin at Avon, just east of the Strait, is currently being considered. The dredged area would serve both as a turning basin and as a turnout for ships in the event of problems with the Union Pacific Railroad bridge over the Carquinez Strait. Studies are being conducted on the environmental and economic feasibility of the project.
4. **Bridges.** Historically, there have been no pollution incidents in the Bay Area attributable to improper bridge location, pier placement, navigational lighting, clearance gauges, protection systems or drawspan operation. The U. S. Coast Guard coordinates navigational and

³⁰ Harbor Safety Committee (1999) Recommendation V.4.

operational requirements on all bridge projects to ensure safety is maintained. Existing bridges are carefully evaluated for their ability to meet the reasonable needs of navigation prior to receiving a federal permit. All future proposed bridges receive the same thorough review prior to permitting. Drawbridges operate under carefully tailored regulations to ensure safety and operational transportation needs are met. Bridges that have allegedly grown too small for navigation or are alleged to be improperly maintained or operated can be brought to the attention of the U. S. Coast Guard for review and appropriate corrective action.

Bridges require maintenance work, perhaps seismic retrofits, and other repair or improvement projects over time. Review and approval of plans by the U.S. Coast Guard ensures such bridgework will not create any navigational hazards and therefore reduces the risk of accidents.

The U.S. Coast Guard and the San Francisco Bar Pilots currently have a high level of involvement and liaison in making decisions on the proposed placement of pilings and footings for bridges. Construction impacts are carefully examined and coordinated by the U.S. Coast Guard prior to and after approval/issuance of a U.S. Coast Guard bridge permit. Pursuant to the General Bridges Act of 1946, the U.S. Coast Guard has the authority to regulate bridge locations, bridge alignments, pier location, horizontal clearance between piers, vertical clearance between low steel and the water, and all temporary construction impacts, from abutment to abutment or from where the bridge approaches break grade. In making its decision, the U.S. Coast Guard takes into consideration comments from regulatory agencies, special interest groups and the public at large.

Bridges may be equipped with fendering around pilings to minimize the damage done by collisions. Currently, most fendering is wooden or plastic. New, energy-absorbing fendering is available that would further minimize damage from collisions. This type of fendering, instead of wooden or plastic fendering, has been recommended by the Harbor Safety Committee to replace damaged fendering and for all new construction. The Office of Spill Prevention and Response (OSPR) requests Caltrans and other bridge owners use energy-absorbing fendering when possible.³¹ The U.S. Coast Guard requires that fendering systems be of a non-sparking material and a proposed fendering plan is evaluated prior to permitting by the U.S. Coast Guard. Newer materials may provide even greater protection in the future.

The Bay and Delta are home to many moveable bridges that swing or draw open. These bridges are subject to federal regulation for all aspects of their operation. Drawbridges that do not have specific operating regulations must open on demand.³²

³¹ Harbor Safety Committee (1999) Recommendation IX.1.

³² 33 C.F.R. § 117, Subpart A and B (1999).

Water level gauges, generally placed by NOAA, and clearance gauges, regulated by the U.S. Coast Guard, aid vessel operators in determining when transit under a bridge is safe.³³ This is especially important in the Delta where there are many bridges. The Harbor Safety Committee reports that all necessary bridge clearance gauges are in place.³⁴ However, the Committee notes that bridge level gauges indicating the clearance between the water and the bridge span are too small to be of use to larger vessels because these vessels are already committed to transit by the time the gauges become visible. When clearance gauges require size adjustments to become more visible, the Harbor Safety Committee should notify the U.S. Coast Guard so that the necessary adjustments can be made, pursuant to federal regulation. Some water level gauges provide real-time information on water depth. New gauges or replacement gauges may be needed in the future. Along with gauges, lights and beacons may be required on bridges to aid navigation. Seven bridges in the area have radar-beacons (RACONS). Bridge lights also provide information on bridge support locations, the position of a drawbridge, and other information especially useful to boaters.

5. **Electronic Information Systems.** Electronic media provide some of the most efficient information systems available to mariners and spill response coordinators. For example, the Marine Exchange is presently commissioned by the Department of Boating and Waterways to operate the Physical Oceanographic Real Time System (PORTS). PORTS integrates real-time environmental observations, forecasts and other geospatial information available both by phone and over the internet. PORTS measures and disseminates observations and predictions of water levels, currents, salinity, and many meteorological parameters needed by a mariner to navigate safely. The objectives of the PORTS program are to promote navigational safety, improve the efficiency of U.S. ports and harbors, and ensure the protection of coastal marine resources. Because PORTS provides accurate, real-time information, it can aid both in prevention (by improving navigational safety) and response (by allowing response personnel to predict spill trajectories). The long-term funding of PORTS is still an issue.³⁵ Newer electronic systems are currently planned for Bay use. Other systems, such as the Automatic Identification System (AIS), will provide important information to mariners as well as the ability to coordinate the information currently available in a fully electronic format. These systems should enjoy the continued support of BCDC.
6. **Aids to Navigation.** Aids to navigation are regulated by the U.S. Coast Guard under a separate regulatory authority from the authority used to place gauges, markings or signals on bridges.³⁶ RACONS can also be placed on floating structures such as buoys. The judicious use of RACONS is practiced because in some instances a RACON may obliterate part of a

³³ 33 C.F.R. § 118 (1999).

³⁴ Harbor Safety Committee (1999) Recommendation IX.2, 3, and 4.

³⁵ Harbor Safety Committee (1999) Recommendation II.1.

³⁶ 33 C.F.R. § 62 (1999).

radar screen where the hazard exists or other obstacles may be hidden by a RACON return. Numerous aids to navigation, such as bouys, lights and signs are in place and are maintained by the U.S. Coast Guard.

The U.S. Coast Guard evaluates the need for new navigational aids and installs them where necessary. The target group for navigational aids ranges from the 1,000-foot long cargo ship to the small recreational boat. The request for a new navigational aid is usually made at the request of a maritime organization. The U.S. Coast Guard evaluates a request in terms of public benefits and detriments, uses computer models to determine where to locate them and what type of ancillary equipment should be included (lights, sounds, power sources, etc.). A "Notice to Mariners," that reaches approximately 2,000 people, is used to inform the public about aids to navigation. Radio broadcasts on VHF-FM Radio are also used to increase the audience receiving the "Notice to Mariners." Regulatory changes are published in the Federal Register for a period that lasts between 30 to 60 days. Aids to navigation qualify for a categorical exclusion under the National Environmental Policy Act. These aids serve a significant water-oriented use by reducing the risk of collisions. BCDC also has a participatory role with respect to the placement of aids to navigation through its membership on the Harbor Safety Committee, which helps implement safety measures. Moreover, the public, including other agencies, may always recommend appropriate changes to existing aids to navigation or request new ones.

7. **Recreational Users.** Recreational use is important to the Bay. On a nice day, well over 1,000 recreational users are on Bay waters. There are approximately 20,000 marina berths in the Central Bay alone.³⁷ Some large marinas are located near important port areas. Many users prefer even smaller craft such as personal water craft, such as jet skis, kayaks, canoes, and sailboards. As a result, recreational users operate in close proximity to designated shipping lanes. However, many users are not familiar with safety guidelines and the "rules of the road" regarding interaction with large vessels, such as the U.S. Coast Guard's Rule 9 which states that vessels: "less than 20 meters in length or a sailing vessel shall not impede the passage of a vessel that can safely navigate only within a narrow channel or fairway."³⁸ Many may not even know where shipping lanes are located. Most do not have the equipment necessary to communicate with large vessels in an emergency or may not know what procedure to use. Properly educated recreational users increases navigational safety for large vessels.

Educational information is currently available from the Coast Guard, U.S. Power Squadrons, the Department of Boating and Waterways, OSPR, and the Prevention Through People workgroup. Some safety information is provided to users when registering their craft. The Harbor Safety Plan has initially identified other possible target areas for education including

³⁷ Harbor Safety Committee (1999) X-1.

³⁸ 33 U.S.C. 2009 (1999), Rule 9, Inland Steering and Sailing Rules

marinas, boat ramps, launches, and rental establishments, especially those for personal watercraft.³⁹ BCDC often has permitting authority over many of these facilities. Requiring educational signage regarding shipping lanes and proper communication procedures in these target areas is an efficient way to provide users with needed information.

8. **Ferries and Excursion Vessels.** Ferries and Bay sightseeing excursion vessels are common in the Central Bay and are frequented by commuters, tourists, and partiers. There are many companies operating on the Bay, including the Golden Gate Bridge, Highway, and Transportation District, Blue and Gold, Red and White, and Hornblower Cruises and Events. By bringing people closer to the Bay, each helps residents and visitors appreciate and enjoy Bay resources.

The Vessel Traffic Service keeps statistics on the movement of ferries, container ships, tankers, bulk carriers and other large ships. Of these, ferry trips account for approximately 70 percent of all monitored vessel movements. (See Figure 5). To connect important areas, ferry routes cross major shipping lanes. Recently, new high speed ferry operations have been considered. The Bay Area Water Transit Authority was recently established to develop a plan for expanding ferry transportation in the Bay.

Although the Bay Plan encourages the use of water as an alternative transportation source, concern has surfaced over possible adverse affects of ferry use such as increased traffic and pollution. Examining new or proposed expansions of ferry facilities to ensure that increased traffic does not unreasonably interfere with large vessel movements would increase navigational safety.

Issues in the Transfer of Petroleum Cargoes

1. **Safety of Marine Petroleum Terminals.** Structurally unsound or deteriorating marine terminal foundations increase the risk of oil spill. There are currently 25 marine oil terminals in the San Francisco Bay Area. These facilities are under the jurisdiction of the Marine Facilities Division (MFD) of the California State Lands Commission (CLSC) and the U.S. Coast Guard. As a result of MFD/CLSC efforts, the operational safety and the general condition of these facilities have greatly improved. MFD/CLSC is currently developing comprehensive engineering regulations for both existing and new marine oil terminals. These regulations are performance based, and include criteria for inspection, structural requalification, mooring, fire detection/suppression and the mechanical and electrical systems of these facilities. The MFD/CLSC has been inspecting marine oil terminals throughout the State since 1991.

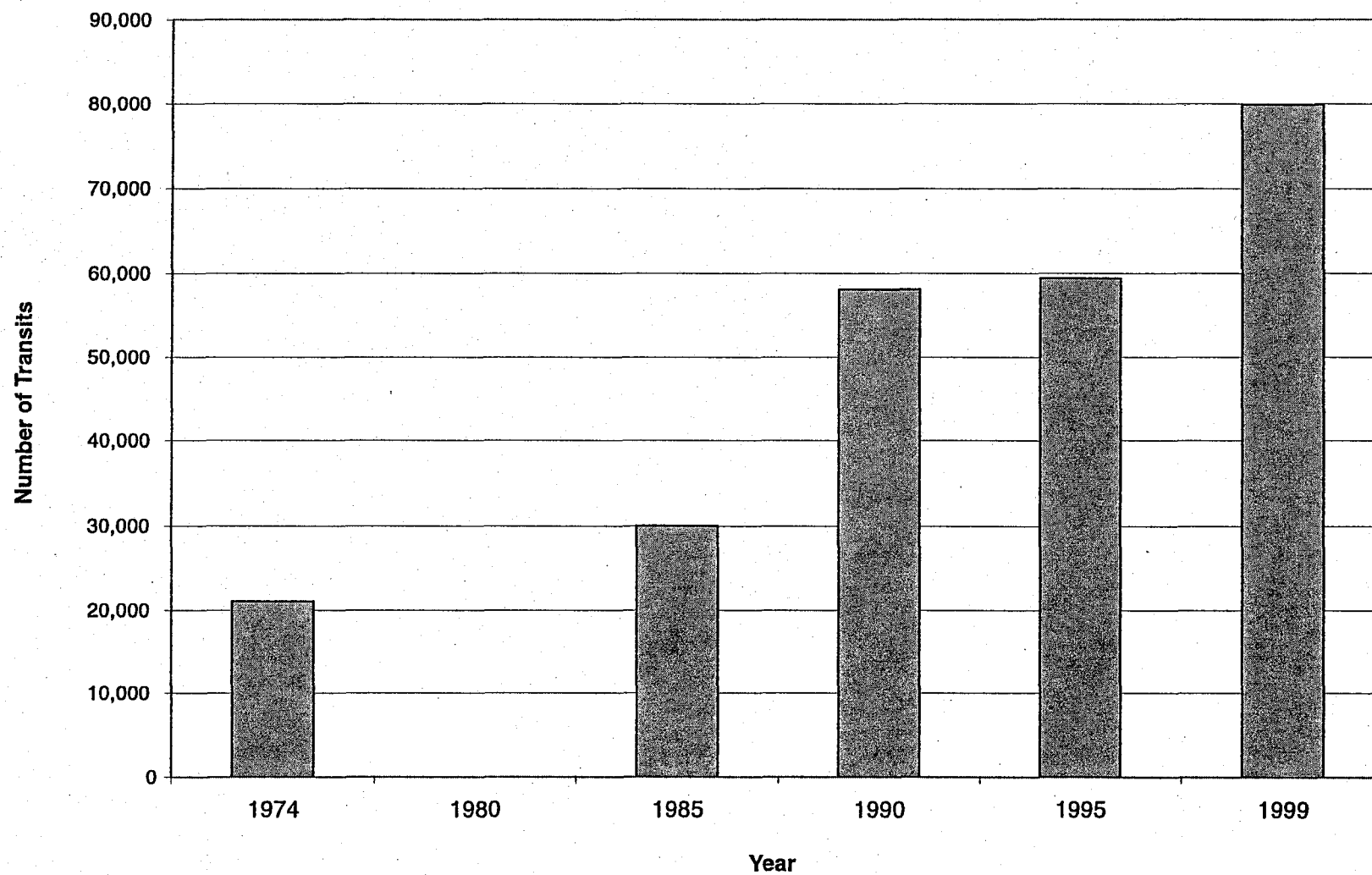
BCDC has concurrent jurisdiction over marine terminals during construction, modification or repair. BCDC, through the Bay Plan, has appointed the Engineering Criteria Review Board to inspect fill, including

³⁹ Harbor Safety Committee (1999) X-7.

Figure 5

SOURCE: USCG Vessel Traffic Service and the CA State Lands Commission

Ferry Transit Per Year



Note: Data from 1980 is not available

pilings and other support structures, according to approved seismically safe designs. The expertise of the CLSC about the structural aspects of marine terminals greatly enhances design safety. In order to ensure the safety of these structures, all inspections and rehabilitation of marine oil terminals should be coordinated through MFD/CSLC.

2. **Oil Transfer.** Sometimes, oil spills occur during transfer either to a marine facility or between ships. There are several different transfer operations. Bunkering is the transfer of oil for the purpose of fueling or providing lubricants to a marine vessel. Lightering is the transfer of a cargo of oil in bulk from one tank vessel to another. The U.S. Coast Guard and OSPR have adopted international standards for establishing minimum proficiency requirements for watchstanders and enforcing rest periods for watchkeeping personnel onboard vessels to minimize fatigue. OSPR and U.S. Coast Guard regulations also specifically cover oil transfer, bunkering, and lightering. CSLC and U.S. Coast Guard regulations govern oil transfers between marine oil terminals and tank vessels or barges. CSLC and U.S. Coast Guard regulations establish the maximum number of hours that marine oil terminal personnel can work in specified periods of time. In addition, all oil transfer personnel must be properly trained and certified by their companies to be proficient to perform their assigned duties.

The combination of these operational guidelines, along with the state and federal requirements for response and containment equipment, adequately reduces the probability of spills during transfer, if followed, and the risk to the environment if oil is spilled. As more studies are produced, better design technologies and operational guidelines should be considered for implementation.

Issues in Response Planning

1. **Contingency Plans.** All major oil spill response legislation includes requirements for contingency planning. Any spill response action must comply with the National Contingency Plan (NCP) established by the Oil Pollution Act of 1990. The Lempert-Keene-Seastrand Oil Spill Prevention and Response Act mandates a centralized State contingency plan. In California, six regional contingency plans cover specific areas. The San Francisco Bay/Delta Oil Spill Contingency Plan is a cooperative effort between OSPR and the U.S. Coast Guard that covers general response strategies in the Bay Area. In addition, every owner or operator of a tank vessel, non-tank vessel of 300 gross tons or greater, or marine facility must have an individual contingency plan according to the requirements set forth in OSPR and U.S. Coast Guard regulations. Each plan must provide for the best achievable protection of coastal and marine resources. The Commission should be sure that these contingency plans are in place and approved by OSPR and the U. S. Coast Guard before authorizing any new work on marine facilities.

2. **Response Equipment.** Response strategies outlined in contingency plans include designated command structures, clean-up methods, and response equipment. OSPR and U.S. Coast Guard regulations for individual owners indicate in detail how much response equipment is needed, including the amount of boom, boom-carrying boats, sorbent materials, and skimmers. Holding tanks and other support devices are also needed for recovery. Some equipment must be located in the Bay or along the shoreline in order to be effective. The closer mechanical response measures are to a spill, the more effective response actions will be. Necessary equipment should be strategically located around the Bay.
3. **Sufficiency of State OSRO Drill Program.** In the past, there have been concerns over the sufficiency of contingency plan requirements and the testing of Oil Spill Response Organizations (OSRO's). Many of these issues are outside the scope of this report. However, BCDC's continued involvement in the review of OSPR regulations regarding contingency planning is an effective way for the Commission to be involved in this area. The Assembly Natural Resources Committee and the Assembly Select Committee on the Protection of Inland Waterways held a joint hearing to examine issues related to response organizations. Topics included the history of the state drill program, the allocation of drill costs, OSPR's financial condition, and the effectiveness of the Technical Advisory Committee.⁴⁰ To address the problems identified at the hearing, legislative and regulatory changes were proposed and are going through the review and approval process. In addition, the OSPR has been carrying out a successful drill program over the last year or so, and many of these drills have been called in San Francisco Bay. The lessons learned from these drills helps improve upon the effectiveness of the contingency plan requirements. Staff members will continue monitoring the progress of these issues and participating in relevant hearings and committees.

⁴⁰ For a complete overview of the Joint Hearing see Drills for Oil Spill Responders, Briefing Paper for Joint Hearing of Assembly Natural Resources Committee and Assembly Select Committee on Protection of Inland Waterways. Roger Dunston, California Research Bureau, June 2000.

CHAPTER 3

Legal and Institutional Framework

The importance of navigational safety, along with growing concerns about spills of oil and other hazardous materials, has led to an elaborate and highly integrated legal framework to address navigation and harbor safety. Statutes address spill prevention, including navigational safety, and contingency planning requirements. Federal statutes establish requirements for federal agencies. In California, many laws deal directly or indirectly with potential oil spills. Several reinforce existing federal or State laws. These statutes create and allocate authority to various agencies and committees. The same agency may be named in numerous statutes with varying levels of responsibility. Cooperation among agencies with similar jurisdictions is essential to adequately address the possibility of oil spills. Although there are many laws, policies, and regulations that deal with the possibility of oil spills, only the most significant are discussed below.

International Laws, Policies, and Regulations. The shipping of petroleum cargo is an international business. In 1984, the United Nations established the International Maritime Organization (IMO) as the first ever international body devoted exclusively to maritime matters. The main concern was to improve safety at sea. In addition, the threat of marine pollution from ships, particularly pollution by oil carried in tankers, is a concern for the IMO. To achieve its objectives, the IMO has promoted the adoption of some 40 conventions and protocols and adopted well over 800 codes and recommendations concerning maritime safety and the prevention of pollution. Implementation of the requirements of a convention is mandatory for countries which are parties to it, including the United States. The 1954 Oil Pollution Convention was the first convention designed to curb the impact of oil pollution. This convention has been periodically updated since 1954 to cover issues like compensation for oil damage, liability, prevention and preparedness.⁴¹

The Supreme Court recently discussed the importance of an international regime of regulation of maritime matters in *United States v. Locke*, 120 S. Ct. 1135 (2000). The scheme of regulation includes a significant and intricate system of international treaties and maritime agreements bearing upon the licensing and operation of vessels. The existence of maritime treaties and agreements on standards of shipping is of relevance, of course, for these agreements give force to the longstanding rule that enactment of a uniform federal scheme displaces state law, and the treaties indicate Congress has demanded national uniformity regarding maritime commerce. As such, it is essential that the Bay Plan be updated to ensure it contains proper guidance for the Commission when it exercises its authority on projects that could effect maritime commerce.

⁴¹ [http://www.imo.org/International Maritime Organization home page - What it is, what it does and how it works?](http://www.imo.org/International%20Maritime%20Organization%20home%20page%20-%20What%20it%20is,%20what%20it%20does%20and%20how%20it%20works?)

Federal Statutes

1. **Ports and Waterways Safety Act of 1972.** In 1972, the Ports and Waterways Safety Act authorized the U.S. Coast Guard to enact measures for controlling vessel traffic or for protecting navigation and the marine environment. It also requires the U.S. Coast Guard to issue regulations addressing the design, construction, alteration, repair, maintenance, operation, equipment, personnel qualification and manning of vessels that may be necessary for increased protection against hazards to life and property, for navigation and vessel safety, and for enhanced protection of the marine environment.

In "Intertanko,"⁴² to ensure national uniformity in these matters, the Supreme Court ruled that Titles I and II of this act, read in conjunction with the Oil Pollution Act of 1990 which amended the safety act, pre-empt some state regulations. State regulations regarding design, construction, alteration, repair, maintenance, operation, equipping, personnel qualification and manning of tankers are subject to federal pre-emption. The U.S. Supreme Court further held that the control of vessel traffic in state water might be regulated by the state as long as the regulation is based on peculiarities of local waters that call for precautionary measures, but only if there is no conflict with federal measures, which would include a federal determination that no regulatory measures were necessary.

2. **Oil Pollution Act of 1990.** The U.S. Oil Pollution Act of 1990 (OPA 90) was the Congressional response to the dangers illuminated by the catastrophic Exxon Valdez spill in 1989. The Act outlines federal mandates dealing with spills of oil, including liability, penalties, research and development, prevention, and removal. Under the Act, the Secretary of the Department of Transportation, whose departments include the U.S. Coast Guard, is charged to make findings, promulgate regulations, and set forth planning requirements. Title I of OPA 90 saves to the states authority to impose requirements with respect to oil spill liability and compensation, permitting the states to maintain their own pollution funds and permitting states to establish civil and criminal liability for spills alongside the federal government.

Title IV, Subtitle A, deals with oil spill prevention. Relevant sections address human error, communication, vessel traffic systems, procedures, and equipment. Under Subtitle A, the Secretary is required to promulgate regulations regarding vessel plate thickness, tank pressure, overflow monitoring devices, and liners. The Secretary must also produce a study on tanker navigational safety standards. Section 4115 establishes double hull requirements for tank vessels.

Title IV, Subtitle B, deals with response. Section 4202 establishes a national planning and response system. The National Contingency Plan, 40 CFR 300, is part of this system. State actions must comply with this plan through the Federal On-Scene Coordinator (OSC). Various port areas,

⁴² United States v. Locke, 529 U.S. 89, 120 S. Ct. 1135 (2000).

including those within the San Francisco Bay, have detailed Area Contingency Plans prepared in cooperation with the Coast Guard and other federal and state agencies.

3. **National Contingency Plan.** The National Contingency Plan establishes the U.S. Environmental Protection Agency (EPA) as the lead agency in the National Response Team for response to spills in inland waters. The Coast Guard is the Federal OSC for spills in coastal waters. The plan designates the responsibilities of the Federal OSC who shall direct all federal, state, and private response activities at the site of discharge. The plan also helps define the objectives, authority and scope of Federal Contingency Plans, including the National Contingency Plan, Regional Contingency Plans, and Area Contingency Plans. Funds from an oil spill liability trust fund can be distributed to aid in oil spill clean-up.

California is also within the U.S. Coast Guard District 11 (D11) Centralized ACP. Within the area also covered by the Statewide contingency plan, there are six regional federal contingency plans. The San Francisco Area Committee, led by the Coast Guard, has prepared and recently updated the San Francisco Bay/Delta Oil Spill Contingency Plan. This plan covers spill response strategies for San Francisco Bay, San Pablo Bay, and Suisun and Grizzly Bays, up to the Sacramento River Delta and the outer coasts of Sonoma, Marin, San Francisco, and San Mateo counties.

4. **Clean Water Act.** The Clean Water Act prohibits the discharge of oil or hazardous materials into the navigable waters of the United States. Many different agencies are involved in fulfilling the mandates of the Clean Water Act. The Act also requires the President to establish methods for removal of oil and hazardous substances as part of the National Response System, establish Area Committees to produce Area Contingency Plans, and issue regulations including guidelines for vessel and facility response plans. Subsequent Discharge of Oil laws help clarify terms used in the Clean Water Act. Section 110.6 states that any person in charge of a vessel or onshore or offshore facility shall notify the National Response Center, Coast Guard, EPA, or predesignated OSC as soon as he or she has knowledge of any discharge.
5. **Coastal Zone Management Act of 1972.** The federal Coastal Zone Management Act is a voluntary law enacted to encourage coastal states to develop and implement programs to manage the nation's coastal resources. Both the California Coastal Commission and BCDC implement the federal act. BCDC's coastal management program is based on the provisions of the McAteer-Petris Act, the Suisun Marsh Protection Act of 1977, the San Francisco Bay Plan, the Suisun Marsh Protection Plan, and Commission regulations. Any federal activity that affects the coastal zone within BCDC's jurisdiction must be consistent with the Commission's federally approved program.

State Statutes

1. **Lempert-Keene-Seastrand Oil Spill Prevention and Response Act.** This Act is California's major oil spill legislation. The Act recognizes the volume of petroleum products transferred through the state each year and the danger posed by spills to coastal waters, bays, and estuaries. The Act's major components are:
 - a. **The Harbor Safety Committee.** The Lempert-Keene-Seastrand Oil Spill Prevention and Response Act establishes Harbor Safety Committees for each major harbor in the State. The San Francisco, San Pablo and Suisun Bays Harbor Safety Committee examines the Bay Area. The 15 member Committee is comprised of representatives of the maritime community, including port authorities, shipping companies, a pilot, a pleasure or fishing boater, an environmental organization, a labor representative, a barge operator and a tug operator which are all voting members. The U.S. Coast Guard and the Army Corps of Engineers are also full members and may participate at any level they choose, including voting. BCDC is also a voting member on the Committee. The Committee is charged with making navigational safety findings using the guidelines detailed in the Act. Pursuant to these guidelines, the Harbor Safety Committee developed the San Francisco, San Pablo and Suisun Bays Harbor Safety Plan. After extensive evaluation by the Harbor Safety Committee and its subcommittees, the Plan recommends measures that would advance navigational safety goals in the Bay. Pursuant to the Lempert-Keene-Seastrand Act, the OSPR administrator is obligated to take steps to implement its recommendations.
 - b. **Contingency Planning.** The Act required the Governor to establish a state oil spill plan, yet it also required the existing plan to be amended by adding a marine oil spill element. The California Oil Spill Contingency Plan has been prepared to serve as the Marine Oil Spill Contingency Planning Section of the State Hazardous Materials Incident Contingency Plan, which resides with the California Office of Emergency Services.
 - c. **Establishes Administrator.** The Act names a chief deputy director of the California Department of Fish and Game as administrator. The Department of Fish and Game established the Office of Spill Prevention and Response (OSPR), a subsidiary agency that deals with the prevention of, and the response to, spills of oil and petroleum products.
 - d. **Aids to Navigation.** The Act recognizes the importance of safe navigation and charges the administrator to negotiate with the Coast Guard for adequate Vessel Traffic Service systems to protect the waters of the State. The act also establishes Harbor Safety Committees to evaluate and make recommendations regarding navigational safety. The administrator adopts rules for tugboat escorts based on the recommendations of the Harbor Safety Committees. Each Harbor Safety

Committee publishes a Harbor Safety Plan which covers specified topics. The Act also identifies priorities for safety, including "[a]ppropriate shipping lanes and navigational aids for tankers, barges, and other commercial vessels."

- e. **Regulations/Inspections** The Act requires the administrator to adopt regulations regarding tug boat escorts. The administrator is given the power to carry out periodical announced and unannounced drills to determine if contingency plan responses are adequate. Section 8670.17 allows the administrator to adopt regulations governing "marine terminals regarding the equipment, personnel, and operation of vessels, to and from which the terminals may be used to transfer oil." The Act also supports the federal double hull requirement for tank vessels.
 - f. **Cooperation.** The Act encourages cooperation between different governmental entities. The State Interagency Oil Spill Committee, which consists of various members of affected State agencies, is established to aid in interagency cooperation and expedite spill prevention and response initiatives. The Act also requires a memorandum of understanding with the Regional Water Quality Control Board in order to expedite response.
 - g. **Technology.** The Act establishes a Technical Advisory Committee to provide guidance as to technical aspects of spill prevention and response. The administrator is also charged with investigating the feasibility of new technologies.
 - h. **Financial Responsibility and Funds.** Every owner or operator of a tank vessel or non-tank vessel of 300 gross tons or over must demonstrate financial responsibility by insurance, surety bond, letter of credit, or other means in order to transport oil across marine waterways of the State. The Act also creates the Oil Spill Prevention and Administration Fund and the Oil Spill Response Trust Fund.
2. **Public Resources Code, Div 7.8.** Sections 8750 through 8760, enacted as part of the Lempert-Keene-Seastrand Act, allows the California State Lands Commission (CLSC) to regulate certain aspects of oil transfers and terminals. Section 8755 of the Public Resources Code (P.R.C.) requires CSLC to adopt rules, regulations, guidelines, and leasing policies for reviewing the location, type, character, performance standards, size and operation of all existing and proposed marine terminal within the State, whether or not on lands leased from the State. CSLC is to ensure that the regulations are periodically reviewed and modified as necessary to ensure that all terminal operators always provide the best achievable protection of the public health and safety, and the environment. Section 8757 directs CSLC to inspect or cause to be inspected, on a regular basis, all marine terminals, along with associated equipment, and to monitor their operations. Each marine terminal operator must have an approved operations manual describing the equipment and procedures employed to safely conduct the transfer of oil to and from tank vessels and barges. Marine terminal operators must also comply with Training and

Certification regulations, pipeline testing and structural standards for vapor control systems located at marine terminals. Other statutory provisions governing contingency planning, marine safety and adoption of rules, regulations and guidelines for marine terminals are contained in other parts of the Act, under Chapter 7.4 of Title 2, Division 1 of the Government Code.

3. **Fish and Game Code.** The Fish and Game Code provides generally for remedies against anyone who unlawfully or negligently takes or destroys any protected wildlife. A discharge of oil or oil spill that results in the destruction of species may result in civil or criminal penalties.

The Code specifically provides for damages for any spill of petroleum in State waters. Section 5655 states that the State can clean up petroleum discharges or abate the affects of the discharge and seek recovery of those costs from the responsible party. The Code also restricts the discharge of any other deleterious substance or introduction of nuisance species from ballast water.

4. **Harbors and Navigation Code.** The Harbors and Navigation Code, administered in part by the Department of Boating and Waterways, requires proper overflow monitoring for ship to shore, shore to ship, and ship to ship transfer of any petroleum product, chemical, or other hazardous substance. This monitoring can be accomplished with either a properly installed, operated, and maintained mechanism or a sufficiently rigorous operating procedure. The Code also prohibits the dumping of any fuel oil, oil sludge, or oil refuse into navigable waters of the State. It also creates "absolute liability" for damage from vessels engaged in transfer or leakage from oil rigs, pipelines, and other oil related activities. The sheriffs of fifty-eight counties are involved in the enforcement of this code.
5. **Revenue and Taxation Code, Part 24, §46001.** The Revenue and Taxation Code details the administrative fee procedure created by the Lempert-Keene-Seastrand Act. Section 8670.40 of Lempert-Keene-Seastrand establishes a prevention fee to fund participation by Oil Spill Committee members, to implement emergency programs, and to research prevention technologies. Section 8670.48 creates a similar fund for response. The code outlines creditor and debtor obligations related to the payment of these fees, as well as legal recourse if necessary.
6. **Water Code §13272.** Section 13272 states that any party that causes or permits the discharge of any petroleum product into State waters shall report such discharge to the Office of Emergency Services as soon as possible. This provision of the State Water Code mimics the federal Clean Water Act.
7. **McAteer-Petris Act.** The McAteer-Petris Act gives BCDC authority over the placement of fill, extraction of materials, or substantial change in use of water, land, or structures within its jurisdiction. BCDC has jurisdiction over all areas subject to tidal action from the south end of the Bay, within the Golden Gate, extending northeasterly near the confluence of the

Sacramento and San Joaquin rivers, including all marshlands up to five feet above mean sea level, tidelands, and submerged lands. The jurisdiction also includes a 100-foot band inland from the Bay shoreline, as well as saltponds, managed wetlands, and certain waterways. The Commission also has power to review federal activities for consistency with the Commission's federally-approved coastal zone management program for the San Francisco Bay segment of the California coastal zone.

Federal Agencies

1. **U.S. Coast Guard.** In San Francisco Bay, U.S. Coast Guard operations are focused on meeting five strategic goals for safety, protection of natural resources, mobility, maritime security and National Defense. The Coast Guard has federal jurisdiction over any vessel in U.S. waters subject to interstate commerce. Coast Guard regulations may place speed limits on vessels and establish other safety guidelines like shipping lanes and the placement of navigational aids. Because of the work of the Coast Guard, San Francisco Bay has an outstanding navigational safety record to this point.

The Coast Guard is the lead federal agency in spill response in coastal waters. The Coast Guard publishes an Area Contingency Plan for San Francisco Bay and a field operations guide to be used in oil spill response. The ACP, produced in coordination with the State Office of Spill Prevention and Response, business and other agencies, is designed to establish spill response policies, outline response command structures, and designate environmentally sensitive sites. The ACP also encourages that easily accessible, appropriate spill response equipment is strategically located and available throughout the Bay. The Coast Guard Captain of the Port, or other high ranking officer, is the predesignated Federal On Scene Coordinator in spill events. As head of the Incident Command System, the Federal On Scene Coordinator is in charge of the decision making body for all agencies in spill events.

In San Francisco Bay, the Marine Safety Office and the Vessel Traffic Service of the U.S. Coast Guard provide numerous benefits to safe navigation and oil spill prevention.

2. **Captain of the Port.** The Captain of the Port, head of the Marine Safety Office, as designated by the U.S. Coast Guard Commandant, administers and enforces the Port Evaluation and Security, Marine Environmental Responses and Waterways management programs within its boundaries. When his or her duties include vessel safety elements, such as in San Francisco, his or her unit is referred to as the "marine safety office." The Captain of the Port is responsible for supervision and control of vessel

movements, moorings and anchorages, monitoring transfer of bulk liquid cargo, enforcement of regulations concerning port safety, security and marine pollution, periodic examinations of foreign vessels, and immediate response to discharges of oil, among other duties.⁴³

3. **Vessel Traffic Service.** The Vessel Traffic Service (VTS) promotes the safe and orderly flow of traffic in and out of San Francisco Bay for power driven vessels of more than 40 meters, passenger vessels with more than 50 people, towing vessels and marine events. VTS increases the quality and timeliness of information a mariner needs for safe navigation of a vessel. The location and intentions of other vessels, navigation discrepancies, hazards to navigation, weather reports and other information are passed on to participating vessels. VTS also alerts vessels of potential dangers and recommends, advises or "directs" a course of action to avoid conflicts. A "direction" issued by the VTS is made under the authority of the Captain of the Port and failure to follow the direction would subject the ship's master to the possibility of civil or criminal penalty. The VTS in San Francisco Bay includes a Vessel Traffic Center located on Yerba Buena Island. It is staffed by experienced U.S. Coast Guard personnel who use a variety of radio, radar, closed circuit television, radiotelephone and a Vessel Movement Reporting System to provide the necessary surveillance of ship traffic in the Bay.⁴⁴
4. **Army Corps of Engineers.** The Army Corps of Engineers has primary responsibility for maintaining the navigable waters of the United States. The Corps must give permission for the placement or extraction of any fill or dredged material in any of these areas. The Army Corps currently carries out seven Congressionally-authorized navigation projects within the San Francisco Bay. The research and expertise of the Corps are especially important in the maintenance of shipping lanes and the removal of underwater obstructions like the pinnacles near Alcatraz. The Army Corps also maintains many dredged material disposal sites.
5. **Environmental Protection Agency (EPA).** The Clean Water Act, the Oil Pollution Act, the National Contingency Plan, Oil Pollution Prevention, and the Discharge of Oil are the major legislative acts that make up the EPA's Emergency Response Program.⁴⁵ The program is designed to prepare and respond to any oil spill affecting the inland waters of the United States.⁴⁶ The Oil Spill Program is administered through the EPA headquarters and the 10 EPA regional offices. The Clean Water Act directs EPA to review and comment on proposed dredging activities. EPA is also involved in the designation and management of ocean disposal sites for dredged material.

⁴³ U.S. Dept. of Transportation, Bureau of Transportation Statistics, Maritime Administration, U.S. Coast Guard (1999) 92.

⁴⁴ U.S. Dept. of Transportation, Bureau of Transportation Statistics, Maritime Administration, U.S. Coast Guard (1999) 90.

⁴⁵ U.S. Environmental Protection Agency ("EPA"), <<http://www.epa.gov/oilspill/index.htm>>.

⁴⁶ U.S. Environmental Protection Agency ("EPA"), <<http://www.epa.gov/oilspill/index.htm>>.

6. **National Oceanic and Atmospheric Administration (NOAA).** NOAA participates in the surveys of waterways in the United States and publishes and updates the nation's nautical charts. Through its Office of Response and Restoration, NOAA's National Ocean Service applies scientific information and objective analysis to reduce risks to coastal habitats and resources. NOAA is a federal natural resource trustee responsible for protecting and restoring marine and coastal natural resources impacted by spills. NOAA's Damage Assessment and Restoration Program helps restore coastal and ocean resources that have been adversely affected by spills. It provides a team of scientists to coordinate and synthesize information for the federal On-Scene Coordinator (OSC) in marine and coastal spills. NOAA also administers the National Marine Sanctuaries located just outside the Golden Gate.
7. **U.S. Fish and Wildlife Service and the National Marine Fisheries Service.** The National Marine Fisheries Service, a part NOAA, and the U.S. Fish and Wildlife Service must be consulted on the impacts on fish and wildlife resources for all federally funded, licensed, or permitted projects. Under the Endangered Species Act, the Services can recommend conditions for activities that may adversely affect habitats of threatened or endangered species.

State Agencies

1. **Department of Fish and Game.** The California Department of Fish and Game carries out its duties under the Lempert-Keene-Seastrand Act through the Office of Spill Prevention and Response (OSPR). Under California law, the OSPR Administrator has the preliminary authority to direct prevention and clean-up efforts with regard to all aspects of any oil spill in the marine waters of the state. OSPR's regulations, contained in Title 14, California Code of Regulations, Subdivision 4, establishes programs which implement certain provisions of the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act.

OSPR ensures that owner/operators of tank vessels and non-tank vessels of 300 gross tons and over demonstrate financial responsibility for oil spill clean-up costs in accordance with its own regulations and Lempert-Keene-Seastrand. OSPR regulations also contain rules on the nature of participation on the Harbor Safety Committee, procedures for oil transfer, and operational guidelines for vessels. Contingency Plan regulations set forth specific requirements for the owners and operators of marine petroleum terminals, facilities, and vessels (plan-holders) that ensure each has an adequate contingency plan in place to be used in the event of a spill. Each plan-holder must possess or contract for resources sufficient to respond to a reasonable worst case spill. OSPR is allowed to test plans by calling announced and unannounced drills. OSPR also has state authority over the use of all response methods, including the use of dispersants and other clean up agents.

2. **California State Lands Commission.** The California State Lands Commission (CLSC) was created by the California Legislature in 1938 and was given the authority and responsibility to manage and protect the important natural and cultural resources on public lands within the State and the public's right to access these lands. The Commission is supported by a staff of more than 200, including specialists in mineral resources, land management, boundary determination, structural engineering, natural sciences, safety management, marine terminal operations, oil spill prevention and ballast water management. The responsibility for the regulation, inspection and monitoring of marine oil terminals within the State, whether or not on leased lands, is assigned to the Marine Facilities Division (MFD). MFD divides its statewide oversight responsibilities between its field offices at Hercules for the northern part of the State and at Long Beach in the southern half of the State. MFD inspectors are in the field, regularly monitoring activities and enforcing regulations seven days a week.
3. **State Water Resources Control Board (SWRCB) and Regional Water Quality Control Boards (RWQCB).** The SWRCB and its six RWQCB's have jurisdiction over State waters and are responsible for carrying out the federal Clean Water Act and the State Porter-Cologne Act. The San Francisco Bay Regional Board's jurisdiction encompasses the nine county drainage for the Bay to the Sacramento River Delta. The Board must certify all projects before permits or licenses can be issued for activities under section 404 of the Clean Water Act or the Porter Cologne Act.
4. **California Coastal Commission.** The California Coastal Act was enacted in 1976 to protect California's 1,100-mile outer coast. The Act is implemented by the California Coastal Commission. The Coastal Commission's jurisdiction begins where BCDC jurisdiction ends, at the line between Point Bonita and Point Lobos. Coastal development permit decisions, review of local coastal programs, and federal consistency determinations in the outer coast are the responsibility of the Coastal Commission.
5. **Department of Boating and Waterways.** The Department of Boating and Waterways is dedicated to improving access to the water for recreational boating and making sure that boating is as safe as possible. Each year the Department provides grants to public entities for launch ramps, shore protection, and other boating related items. The Department is responsible for reviewing, updating, and adopting State boating regulations to remain in conformity with federal law. The Department also has an extensive boater education program.

Other Organizations, Entities, and Programs

1. **Port Authorities.** Individual port authorities administer the public trust in certain areas for the purpose of port development. The Port of San Francisco, the Port of Oakland, the Port of Richmond, and the Port of Redwood City are public port authorities. Benicia Industries and Encinal

Terminals are not publicly created, but still play a role in shipping. BCDC and the Metropolitan Transportation Commission, working with port authorities, have created the San Francisco Bay Area Seaport Plan with policies guiding future port development.

2. **Pilots and Tug Operators.** The San Francisco Bar Pilots and the tug operators are probably the most important people out on the water in terms of ensuring all the laws, policies and regulations are actually implemented. They drive and physically assist the ships inside the port. They have the local knowledge on the maritime and geographic conditions in the Bay, and the Bay Area relies on them daily for safe navigation and oil spill prevention. The licensed San Francisco Bar Pilots provide required pilot service from outside the Golden Gate through the Bay up to the ports of Sacramento and Stockton. Pilots board qualifying ships prior to entering or operating in the Bay, navigate them within the Bay, and disembark the ship once it is in port or outside the Golden Gate. Piloting a vessel inside the Bay requires both a State and federal license. The Harbors and Navigation Code requires the use of pilots inside the San Francisco Bay. Pilots are governed by the State Board of Pilot Commissioners and regularly receive extensive training and continuing education on safe navigation. Pursuant to the OSPR regulations, tank vessel carrying more than 5,000 long tons of bulk oil are required to be escorted by a suitable escort tug or tugs. These tugs are available to respond as needed to influence the speed and direction of the tank vessel in the event of a casualty, steering or propulsion failure, thereby reducing the possibility of collision, allision or grounding and the risk of an oil spill. Tugs are also employed to move oil barges in and out of San Francisco Bay.
3. **Marine Exchange.** Established 150 years ago, the Marine Exchange is a non-profit organization that provides many useful informational services in the Bay to the maritime industry. The Exchange currently operates PORTS real-time nautical information service. PORTS has been recommended for continued engagement because of its success. Acting on behalf of the State of California, the Marine Exchange operates the tanker escort clearing house. The clearing house checks to see if the tugs and tankers are properly matched. Pilots, masters and tugs must check in before the movement of all tank vessels in the Bay, thereby helping ensure that the tug escort rules are implemented within the Bay. The Marine Exchange also functions as the Secretariat to the Harbor Safety Committee.
4. **States/British Columbia Oil Spill Task Force (States/BC).** The States/British Columbia Oil Spill Task Force was formally created by a Memorandum of Cooperation, signed in 1989, following two west coast oil spills: the barge Nestucca, which spilled oil off the coast of Washington and British Columbia in December of 1988; and the Exxon Valdez spill in March of 1989. These events highlighted common concerns shared by west coast states and British Columbia related to spill risks from tanker and barge traffic, the need for cooperation across shared borders, and a shared zeal among West Coast citizens of both the United States and Canada to protect their vulnerable marine resources. The Task Force members are

senior executives from state and provincial environmental / ecology / conservation departments for the States of Alaska, Washington, Oregon, California and the Province of British Columbia. States/BC holds annual meetings at a member's jurisdiction on a rotational basis. The mission of the States/BC is to strengthen member agency efforts to prevent, prepare for, and respond to oil spills on the West Coast by exchanging information, sharing resources, promoting a consistent approach to regulatory standards, collaborating with key stakeholders to address shared concerns, reviewing current legislative and recommending necessary changes, and advocating for a common interest on national and international issues.⁴⁷ OSPR helped found the States/BC task force as an international compact under the authority of Government Code §8670.9, and pays the largest share of States/BC expenses.

5. **Oil Spill Response Organizations (OSRO).** These companies own, operate, and maintain the equipment and personnel to go on-site and respond to an oil spill. Rather than owning and operating their own oil spill response equipment and personnel, contingency plan holders can instead demonstrate that they have contracted with an OSRO with the necessary resources to respond to a spill. Some OSRO's, such as Clean Bay and the Marine Spill Response Corporation, have dedicated equipment and personnel. Others merely contract for response equipment and use other, non-dedicated, maritime equipment and personnel, such as fishermen, during response.
6. **Environmental Organizations.** Many environmental organizations, such as Save San Francisco Bay Association, the Center for Marine Conservation, the Marine Mammals Center, Oiled Wildlife Care Network, International Bird Rescue, and others add expertise and experience regarding oil spill prevention and response issues in the Bay. These organizations may provide valuable insight into navigational and harbor safety issues.
7. **Marine Terminals.** There are a variety of marine terminals in the Bay Area, including those for containers, dry bulk and liquid bulk. All of these facilities routinely berth vessels or barges in order to load and unload cargo. Liquid bulk terminals include marine oil terminals where crude oil and petroleum products may be transferred and other facilities where non-petroleum liquids are transferred. Coast Guard regulations guide the operations of the facilities, and California regulations provide stricter operational oversight, particularly at marine oil terminals. The State regulations are enforced by MFD/CSLC, which includes, but is not limited to, monitoring of day-to-day operations and engineering safety inspections and audits of the facility structure and systems. MFD/CSLC regulations are designed to prevent oil spills, thereby protecting the public health, safety and the environment.

The Coast Guard and OSPR regulate pollution response at all marine terminals. Terminals are required to provide their own response equipment for immediate attention to a spill. Most terminals have a

⁴⁷ States/British Columbia Oil Spill Task Force *Overview* <<http://www.env.gov.bc.ca.eeeb/taskforc/tfview.htm>>

contract with one or more certified OSRO's to provide extensive cleanup capability in the case of larger releases. All of the facilities' oil spill contingency plans are reviewed and approved by OSPR and the Coast Guard. CSLC, the California Coastal Commission, and BCDC also review contingency plans and provide comments to OSPR for consideration and review.

8. **Industry Organizations, Labor Unions and Individual Industry Companies.** There are also numerous organizations and industries, such as the Pacific Merchant Shippers' Association (PMSA), the American Petroleum Institute (API), the Marine Preservation Association (MPA), the International Chamber of Shipping (ICS), the Society of International Gas Tanker and Terminal Operators (SIGTTO), and the American Bureau of Shipping (ABS) to name a few, dedicated to making navigation safe and preventing oil spills, while at the same time providing services that aid the shipping industry. For instance, the Oil Container International Marine Forum (OCIMF) has developed guidelines, which are recognized by the U.S. Coast Guard and the OSPR, for international standards for safe navigation and oil transfer operations. Labor Unions, as do the individual industry companies, also have a vested interest in and are proactive in safe navigation and oil spill prevention.

CHAPTER 4

BCDC's Jurisdiction, Authority, and Responsibility Concerning Navigational Safety

Jurisdiction. BCDC derives its authority primarily from the McAteer-Petris Act and the Suisun Marsh Protection Act. Pursuant to the McAteer-Petris Act, BCDC must issue a permit for the placement of fill, extraction of materials, or substantial changes in use of water, land, or structures within its jurisdiction. BCDC has jurisdiction over all areas subject to tidal action from the south end of the Bay, within the Golden Gate, extending northeasterly near the confluence of the Sacramento and San Joaquin rivers, including all marshlands up to five feet above mean sea level, tidelands, and submerged lands. The jurisdiction also includes a 100-foot band inland from the Bay shoreline, as well as saltponds, managed wetlands, and certain waterways. Pursuant to the Suisun Marsh Preservation Act, the Commission has permit Authority for development in the primary management area of the Suisun Marsh as well as the right to hear appeals of issues arising in the secondary management area. The Commission also has power to review federal activities for consistency with the Commission's federally-approved coastal zone management program for the San Francisco Bay segment of the California coastal zone.

Authority. In order to carry out the McAteer-Petris Act, the Commission prepared the San Francisco Bay Plan (Bay Plan). To keep pace with changing conditions and to incorporate new information concerning the Bay, the McAteer-Petris Act specifies that the Commission may amend or make other changes to the Bay Plan provided the changes are consistent with the provisions of the Act. Because the Bay Plan is part of the federally-approved coastal zone management program, amendments to the Bay Plan must also be approved by the U.S. Department of Commerce. The Bay Plan includes policies that the Commission uses in evaluating permit applications as well as advisory policies. Some of the Bay Plan policies that govern the development of maritime projects include policies on engineering criteria, seismic safety of fills, signage requirements, dredging, recreation and transportation. Construction, done in accordance with sound navigational and harbor safety guidelines, would help prevent accidents that could risk public safety and adversely affect the environment. The Commission should ensure its current permitting process includes coordination with the work of existing agencies, organizations and committees so as not to undermine, duplicate, or impede navigational safety measures within the Commission's existing jurisdiction. Additional BCDC policies could be used to reduce human error; for example, by requiring educational signage at marinas regarding communication, navigation, and harbor safety.

BCDC authorization is necessary for the removal or alteration of any physical obstructions in the Bay which might hinder safe navigation. Both new and maintenance dredging, as well as the removal of submerged obstacles, requires Commission approval. Policies regarding navigational safety should provide the Commission and its staff clear direction regarding work in the Bay that may effect safe navigation.

Responsibility. BCDC is involved in oil spill prevention, response, and navigational safety in the Bay. The Lempert-Keene-Seastrand Act obligates BCDC to participate on the Harbor Safety Committee and review oil spill contingency plans.⁴⁸ BCDC may have to issue permits or cease and desist orders during or after a spill if required by, and consistent with, the McAteer-Petris Act or the Suisun Marsh Protection Act. BCDC would do whatever it could to help in the response and clean-up of an oil spill in the Bay through its role in the Multi-Agency Committee of the Unified Command. This includes expediting the issuance of an emergency permit if one is necessary. By assuming its established position in the Multi-Agency Committee, BCDC would be appropriately positioned in the spill response command structure, and would therefore, not hinder spill response actions. BCDC, like the California Coastal Commission, can also provide support activities, such as advice concerning potential impacts to coastal resources in surrounding and immediate spill areas; advice on land and water uses in the area that may be affected by the oil spill; information to the responsible party on the type of activities that may raise coastal zone issues; and would facilitate the permit acquisition process for any remediation work. BCDC staff members also regularly attend meetings, conferences, and workshops related to oil spill prevention and navigational safety.

Many of the current policies of the Bay Plan would be furthered by an amendment regarding navigational safety. Bay Plan policies seek to protect wildlife, human safety, public access, recreational enjoyment, and water quality. Spills of hazardous materials can damage the Bay ecosystem, including marshes and mudflats, and prohibit use of public access areas. Spills can also adversely affect water quality and can pose risks to human safety. Clear guidelines on navigational safety and prevention of oil spills would reinforce current Bay Plan objectives.

BCDC should coordinate with other State and federal entities dedicated to navigational safety and the prevention of the spills of hazardous materials. In this way, the Commission will further congressional objectives regarding dangerous spills. Findings and policies developed in cooperation with other agencies, committees, and organizations should help provide for maximum public benefit and protection of Bay resources.

⁴⁸ California Government Code §8670.23(a)(7) and §8670.36 (West 1992).

Appendix A

**San Francisco, San Pablo, Suisun Bays Harbor Safety Plan
(As of October, 1999)**

Executive Summary

EXECUTIVE SUMMARY

The Harbor Safety Committee, through its work groups adopted the following recommendations to reduce the risk of oil spills in the San Francisco Bay Region. Each Chapter of the Harbor Safety Plan contains the complete text, background and status of each recommendation. Recommendations which have been implemented are noted by an asterisk(*).

I. Geographical Boundaries

No recommendations

II. General Weather, Tides and Currents

1. The Harbor Safety Committee supports the efforts to increase funding to NOAA. In light of congressional initiatives that would reduce the NOAA's funding or dissolve the agency entirely by eliminating, privatizing or transferring its functions to other agencies, Harbor safety Committee members and interested members of the public should continue to request federal and state funding for PORTS to insure system support after the demonstration period. The Committee urges that the OSPR Administrator support PORTS as a high priority and the OSPR continue to seek and allocate funds to maintain the system once it is installed. The Harbor Safety Committee recommends that the Marine Exchange of the San Francisco Bay Region be designated as the non-profit entity to operate, maintain and market the uses of the PORTS program following conclusion of the federal demonstration project. The Committee further requests that NOAA expedite the update of tide and current data using the latest technology available and publish the water level and current atlases to replace the tidal current charts recalled because of inaccuracies.

2. For the San Francisco main ship channels from the COLREGS Demarcation Line to and between the southern tip of Bay Farm Island and the Union Pacific Railroad Bridge: a) The maximum speed for all power driven vessels of 1,600 or more gross tons shall not exceed 15 knots through the water from the COLREGS Demarcation Line to and between the southern tip of Bay Farm Island and the Union Pacific Railroad Bridge; and b) Power driven vessels of 1,600 or more gross tons shall in any case have their engines ready for immediate maneuver and shall not operate in control modes or with fuels that prevent an immediate response to any engine order ahead or astern or preclude stopping their engines for an extended period of time.*

III. Aids to Navigation

No recommendations.

* Recommendation has been implemented.

IV. Anchorages

Adopt pre-designated anchorage areas within the existing general anchorages throughout the VTS-SF area and in particular within general anchorage No. 9 so that safer and more disciplined anchoring practices may be managed by VTS-SF. *

V. Harbor Depths, Channel Design, and Dredging

1. Facility owners/operators should conduct annual condition surveys noting depths alongside and at the head of their facilities in accordance with standards set by NOAA and including any additional information. *
2. The Committee recommends immediate surveys by the Corps of Engineers for Corps-maintained deep-water navigation channels and by NOAA for all other channels used by deep draft vessels or oil barge traffic that have not been formally surveyed within the last five years. Heavily traveled navigation lanes should be designated by the Corps of Engineers (COE) as project areas in order to ensure frequent, up-to-date surveys of channel depths. Of highest priority are those areas where known shoaling has taken place. Such areas would include shoaling areas east of Alcatraz and west of the Oakland Harbor.
3. The Committee further recommends that NOAA update its charts in a timely fashion to reflect survey information from NOAA, COE and independent sources. NOAA should improve the frequency of published data on channel depths in areas heavily trafficked by oil tankers and barges. NOAA should devise a system to quickly alert VTS, masters and pilots.
4. Establish a new two-way Traffic Separation Scheme north of Alcatraz to allow safer navigation of deeply laden tankers. Several areas, such as Harding, Arch, and Shag Rocks, should be reduced to a minimum of 55 feet depth MLLW.

The Harbor Safety Committee requests the U.S. Army Corps of Engineers to: further refine the Initial Cost Estimates for the Removal of Harding, Arch, Shag, and Blossom Rocks, an Unnamed Rock and Alcatraz Shoal; re-examine East Alcatraz Shoal; evaluate the forty-foot shoal south of the Bay Bridge; and survey the position of two charted wrecks one located near Blossom Rock and the other near the Bay Bridge.

In order to provide funds to match federal funds for lowering the rocks off Alcatraz Island, the Harbor Safety Committee supports a state appropriation as the local match as this project would reduce the risk of oil spills in the Bay which is of substantial benefit to the general public and to the environment.

5. Eliminate the dog leg at buoy "C" of the San Rafael main ship channel in order to maintain proper two-way traffic separation. The Traffic Separation Scheme should be re-routed eastward after due dredging of the western side of Anchorage Area No. 5. * This recommendation, along with all others in this Plan, should be the subject of a complete environmental analysis and examination of alternatives before implementation.

VI. Contingency Routing

1. The high degree of cooperation and consultation between pilot organizations, the U.S. Coast Guard, port authorities and appropriate agencies and contractors should continue from the project planning stage through the construction stage of projects that may impact safe navigation in the Bay. The planning stage should include an evaluation of various alternatives to ensure harbor safety.

2. OSPR should request Caltrans, railroads, and various counties owning bridges for advance notice of work which would temporarily or permanently reduce bridge clearances. Advance notice should be provided as far in advance as possible through the Local Notice to mariners to assure that vessels are alerted to these hazards.

VII. Vessel Traffic Patterns

1. The Coast Guard and VTS should devise a more consistent system of reporting accidents and near accidents, standardized with other areas. The annual reports should together be analyzed on an annual basis by the Coast Guard and a report made to OSPR with recommendations on the effectiveness of navigational safety measures. The committee adopted a definition of a reportable 'Near Miss' situation to standardize reporting along the California Coast.

VIII. Communication

1. Due to increasing congestion on Channel 13, the USCG is proposing to shift the primary VTS channel to Channel 14. The Harbor Safety Committee endorses the Coast Guard's efforts to improve the existing system. *

2. The Harbor Safety Committee recommends the acquisition of adequate backup power supplies for the San Francisco Bar Pilots and San Francisco Marine Exchange communications systems. At a minimum, portable diesel generators obtainable commercially should be procured and arrangements made to provide means of powering minimal lighting and communications circuits. *

IX. Bridges

1. OSPR should request Caltrans and other bridge operators such as the Golden Gate Bridge and Southern Pacific Railroad to install energy-absorbing fendering, instead of wooden or plastic fendering, on all area bridges when replacing damaged fenders and for all new construction.
2. Bridge clearance gauges should be installed where needed, particularly drawbridges. *
3. Water level gauges should be installed at approach points to bridges. *
4. Request the Golden Gate Bridge Highway and Transportation District to install a racon (radio beacon) to mark the center of the channel between the towers of the Golden Gate Bridge to better serve the mariner, particularly during periods of restricted visibility and heavy seas. *
5. Request the Department of Transportation (Caltrans) to install racons on the D-E span of the San Francisco-Oakland Bay Bridge (instead of the G-H span), and the A-B span because the spans vary in height and width and currents can reach considerable velocities running parallel to the towers. *
6. Request Caltrans and the Golden Gate Bridge District to shield bridge floodlights to reduce the glare for ships. *

X. Small Vessels

1. A meeting should be convened by the Harbor Safety Committee with the state OSPR, Fish and Game officials, herring fishermen, Coast Guard, and representatives of the Ports to discuss ways to avoid problems such as nets impeding navigation lanes or berthing areas, nets blocking the egress of fire boats, oil spill response boats and pilot boats, etc. This meeting could result in yearly pre-season meetings with fishermen, Fish and Game mailers to the fishermen informing them of spill prevention concerns, or other actions. *
2. Pilots, Masters, and other interested parties should be invited to witness a series of races from the St. Francis Yacht Club race deck to obtain a view of events from the competitors' level. *
3. Race officials and other interested parties should be invited aboard a large tanker while underway to get the pilot's perspective of racing vessels. *

4. The Yacht Racing Association of San Francisco Bay should furnish full annual race schedules to all interested shippers, and, in particular, the Harbor Safety Secretariat for distribution. *
5. The Yacht Racing Association should furnish optional courses and rounding marks used by participating entities. The race committee for each day's event should choose a course compatible with anticipated large vessel traffic. *
6. The Coast Guard Auxiliary should observe and report infractions. The U.S. Coast Guard suggested that a mailer be prepared, to be inserted with vessel license renewal notices, advising owners of Inland Steering and sailing rules, Rule 9. *
7. Expand the distribution of existing educational pamphlets available from the U.S. Coast Guard. These pamphlets provide information regarding the above-mentioned courses and the phone number for the Boating Education Hotline at 1-800-336-2628 which would provide information regarding the scheduling of these classes. Distribute these educational pamphlets by: enclosing them in the boat registration renewal notices sent to boat owners by the Department of Motor Vehicles in the State of California (a follow-up mailing might also be considered to remind boat owners of these courses); enclosing them in local boat marina mailings to slip renters; requesting marinas to offer a one-time slip rental rebate for completion of a safe boater course. *
8. Encourage vessel operators to document and report violations of the Rules of the Road to the local U.S. Coast Guard office. This would include a direct request to the San Francisco Bar Pilots to assist in this reporting effort. *
9. Make public by publishing punitive actions taken against offenders by the U.S. Coast Guard. This information should be distributed to local yachting and boating magazines and marina newsletters. In addition, the California Department of Motor Vehicles should distribute a summary of punitive activities to registered boat owners. *
10. Encourage the ongoing efforts of the local U.S. Coast Guard Auxiliary and Power Squadron organizations in their boating education and safety effort. *
11. A representative(s) of the Harbor Safety Committee should meet with representatives of the San Francisco Boardsailing Association to promote safer navigation in the Bay by discussing such issues as boardsailing race schedules, race course locations, Inland Steering and Sailing Rule 9 requirements, characteristics of large vessels and tug/barge operations in the Central Bay in relation to boardsailors, and possible education efforts such as posting signs at areas frequented by large numbers of boardsailors (e.g., Crissy Field and Rio Vista) to warn of vessel traffic dangers.

12. Place Additional Emphasis on Recreational Boater Education and Law Enforcement on the Waterways as follows:

- 1) OSPR should put additional emphasis on boater education and law enforcement on the waterways. This can be addressed by the Outreach Program, developed in 1994 and coordinated through the State Department of Boating and Waterways.
- 2) Educational target areas should be identified such as marinas and boat ramps. Boat rental establishments, including personal water craft (jet skis), should also be targeted for an educational thrust, as inexperienced boaters in rental boats are a continuous source of problems.
- 3) The Coast Guard's "Sea Partners Program," a marine environmental protection outreach initiative, should be utilized, in conjunction with the Coast Guard Auxiliary, to disseminate boater safety materials to recreational boaters in the Bay area.
- 4) Kayakers should be approached in the same manner as board sailors were previously approached to promote safer navigation in the Bay. Kayakers have become a problem for vessel traffic due to reckless operation by some individuals.
- 5) The public school system should be encouraged to include Boater Education in the curriculum.

Consideration should be given to providing funds dedicated specifically for increased law enforcement on the waterways.

XI. Vessel Traffic Service

1. Scope of Coverage

- a. Develop standard VTS traffic management procedures for U.S. ports that conform to international standards. *
- b. Make mandatory for civilian and military vessels the current voluntary participation in VTS and extend required participation to include vessels certified to carry 49 passengers or more (i.e., ferries). *
- c. Incorporate the provisions of International Rule 10 in the federal regulations regarding VTS. *
- d. Expand the area of sensor coverage by VTS-SF to monitor the navigable waters of San Pablo Bay north of the San Rafael-Richmond Bridge and east of the Carquinez Straits to New York Point and Antioch. It is anticipated by this

committee that San Pablo Bay may be covered by radar surveillance alone while television monitors, in addition to radar, may be needed in the area of the Strait where continuous change of heading could make radar monitoring alone difficult. Sensor coverage expansion has been repeatedly requested. *

2. Changes in VTS Operations and Requirements

- a. Adopt a dedicated VHF working frequency, Channel 14, for the exclusive use of VTS-SF ship/shore communication system. Channel 13 should continue to be monitored and used for ship/ship communications. *
- b. Upgrade the current equipment used by VTS-SF to include state-of-the-art technology (U.S. Coast Guard, *Port Needs Study: Vessel Traffic Services Benefits*, Volume I: Study Report and Volume II, Appendices, Part 2). *

3. The Harbor Safety Committee supports continued federal funding for VTS-San Francisco in order to ensure navigational safety in the San Francisco Bay Area. *

XII. Tug Escort/ Assist for Tank Vessels

Over a period of five years, the Harbor Safety Committee took the following steps to establish tug escorting in the Bay:

- 1) Adopted Interim Tug Escort Guidelines in 1992.
- 2) Adopted Permanent Tug Escort Guidelines in 1993.
- 3) Adopted Revised Permanent Tug Escort Guidelines in 1995.
- 4) Amendments to Revised Permanent Guidelines Adopted January, 1996 (Revised tug escort regulations effective January 1, 1997).
- 5) Recommended establishing a technical pilotage committee to review waterways specific maneuvers of tankers and tugs.

XIII. Pilotage

1. Amend the California Harbor and Navigation Code to require that shipping company employees eligible to pilot vessels in the Bay area must hold a Master's license with pilotage endorsement and have made at least 20 trips as pilot trainee or observer on vessels over the routes to be piloted within a one-year period.
2. • Amend Coast Guard regulations for pilotage to adjust the limit to 10,000 gross tons for tank barges carrying oil or other petroleum products as cargo to 5,000 gross tons.

3. To prevent unlicensed persons from performing pilotage, it is recommended that the California Harbors and Navigation Code be amended to increase the penalty for acting as a pilot while not holding a pilot license from the maximum penalty for a misdemeanor of \$1,000 to a maximum penalty of \$25,000. *

XIV. Underkeel Clearance and Reduced Visibility

1. The Committee recommended guidelines for underkeel clearances of tank vessels carrying oil or petroleum products as cargo.
2. Because it may be more dangerous for a vessel to remain offshore in the Pacific Ocean in the approaches to the Bay during periods of restricted visibility, vessels inbound from the Pacific Ocean should continue to proceed from the Pilot Area into the Bay to a safe anchorage. *
3. Ships within the Bay at a dock or at a safe anchorage should not commence movement if visibility is less than .5 nautical miles throughout the intended route, unless the Pilot's assessment of all variables listed under general principles is that the vessel can proceed safely. The Pilot's local knowledge should include knowledge of historic weather patterns during that time of year, current weather reports, and checking with reporting stations along the route. *

XV. Economic and Environmental Impacts

No recommendations.

XVI. Plan Enforcement

The Coast Guard and the State Department of Fish and Game should coordinate policies and procedures to the greatest extent possible with each other and with other federal, state, and local agencies. *

XVII. Other: Substandard Vessel Inspection Program

Support the U.S. Coast Guard vessel inspection program of targeting substandard vessels in the Bay. *