SAN FRANCISCO, SAN PABLO AND SUISUN BAYS HARBOR SAFETY PLAN

approved
August 14, 2003

Pursuant to the
California Oil Spill and Prevention Act of 1990

Submitted by the
Harbor Safety Committee of the San Francisco Bay Region
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INTRODUCTION AND MEMBERSHIP OF THE HARBOR SAFETY COMMITTEE

In 1990 the California Legislature enacted the Oil Spill Prevention and Response Act (OSPRA). The goals of OSPRA are to improve the prevention, removal, abatement, response, containment and clean up and mitigation of oil spills in the marine waters of California. The Act (SB 2040) created harbor safety committees for the major harbors of the state of California to plan "for the safe navigation and operation of tankers, barges, and other vessels within each harbor ... [by preparing] ... a harbor safety plan, encompassing all vessel traffic within the harbor." The Harbor Safety Committee of the San Francisco Bay Region was officially sworn in on September 18, 1991 and held it's first meeting that date. The original Harbor Safety Plan for San Francisco, San Pablo and Suisun Bays was adopted on August 13, 1992. SB 2040 mandates that the Harbor Safety Committee must annually review its previously adopted Harbor Safety Plan and recommendations and submit the annual review to the OSPR Administrator for comment.

The full committee of the Harbor Safety Committee holds regular monthly public meetings. The committee chairman appoints a series of subcommittees to review the mandated components of the Harbor Safety Plan and timely issues. All committee and subcommittee meetings are noticed to the public. Public comments are received throughout discussions of the various issues, which results in full public participation in developing the Harbor Safety Plan recommendations of the San Francisco Bay Region

The San Francisco Bay Harbor Safety Plan encompasses a series of connecting bays, including the San Francisco, San Pablo, Suisun Bays, and the Sacramento River to the Port of Sacramento and the San Joaquin River to the Port of Stockton. It is almost a hundred miles from the San Francisco lighted horn buoy outside the bay to the Ports of Stockton or Sacramento. The 548-square-mile Bay has an irregular 1,000 mile shoreline composed of a variety of urban and suburban areas, marshes and salt ponds. Several significant islands are within the Bay, including Angel Island, Alcatraz Island, Yerba Buena Island and Treasure Island. Map 1 depicts the geographic boundaries of the area covered by the Harbor Safety Plan.

The San Francisco Bay system is the largest estuary along the Pacific Coast of North and South America. Waters from the two major river systems and the Bay flow through a single opening at the Golden Gate Bridge, which is less than a mile wide at its narrowest point. Because of the volume of water moving through the narrow opening on a daily basis, strong tides and currents occur in the Bay. While the Bay is extremely deep (356 feet) by the Golden Gate Bridge because of the swiftly moving volume of water, the Bay is very shallow at its extremities and subject to sedimentation from the rivers emptying into the Bay. Sediment is deposited outside the entrance to San Francisco Bay where a semicircular bar extends out into the Pacific Ocean. A dredged Main Ship Channel allows deep-draft ships to navigate into the Bay. About two-thirds of the Bay is less than

18 feet deep. The Bay is significantly shallower due to human alteration. Over a hundred years ago the bay was larger and deeper prior to the gold mining era. Hydraulic miners pumped vast quantities of muddy tailings silting the streams, rivers and Bay system. As a result, the present Bay has widely varying depths. The Bay bottom is predominantly mud.

The Bay has a number of hazards to navigation, such as strong tides and currents and variable bottom depths, which confine large vessels to specified shipping lanes within the Bay. Navigating the Bay becomes more complex during periods of restricted visibility due to winter storms and fog during the spring months when heavy runoff from melting snows floods the river systems that drain into the Bay. The San Francisco Bar Pilots regularly compile recommended guidelines for safe navigation entitled "Port Safety Guidelines for Movement of Vessels on San Francisco Bay and Tributaries." The 1992 recommended guidelines are currently being updated and revised by the Bar Pilots Association. The guidelines are sent to members of the shipping industry, and are based on a general consensus among pilots as to recommended navigation practices.

The natural harbor of the Bay serves the shipping and fishing industries. There are eight ports, twenty-one marine terminals, and naval facilities at Concord Naval Weapons Station and Moffet Field. Military and contract commercial vessels move explosives to the Concord Naval Weapons Station along the Contra Costa/Solano County shoreline. Because the water depths near refineries in Contra Costa and Solano Counties cannot safely accommodate larger oil tankers, large tankers lighter oil to smaller tankers or barges to move cargo in Bay to marine terminals. Map 2 identifies the location of marine terminals in the Plan area. In addition, an expanding ferry system annually makes over 71,000 (1997) trips, mainly to and from San Francisco in the central part of the Bay. As highway congestion increases, ferry traffic substantially increased in the Bay. Because much of the Bay shoreline is urbanized, recreational boating and the growing sport of board-sailing are popular with an estimated 20,000 boat berths around the Bay, exclusive of the Sacramento and San Joaquin Rivers.

The shipping industry is a particularly vital part of the Bay Area economy. Shipping spokesmen estimate that approximately 100,000 jobs are dependent upon the shipping industry and that the industry contributes $4.5 billion to the economy.

Thus, vessel traffic in the Bay consists of a complex variety of inbound and outbound vessels, wholly in-Bay vessel movements, tugs, government vessels, ferry passenger ships, recreational boats, commercial and sports fishing boats, board-sailors and personal watercraft (jet skis) within the series of bays, channels and rivers that comprise the San Francisco Bay planning area.

Membership of the Harbor Safety Committee of the San Francisco Bay Region

The following is a list as of June 2002 of the 16 voting, their alternates, and 3 non-voting members of the Committee:

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Harbor Safety Committee Work Groups

Working Group Assignments
June 2001

Underwater Rocks Working Group

Len Cardoza (Dave Adams), chair
Nick Salcedo

Water Transit Working Group

Nancy Pagan (Jimmy Triplett), chair
Marina V. Sechhitano (Gunnar Lundeberg)
Mik Beatie (Captain Patrick Morgan)

Navigation Working Group

Captain Larry Teague (Captain Eric Dohm), chair
John Davey (Denise Turner)
Scott Merritt

Human Factors Working Group

Don Watters, chair
Tom Wilson (Norman Chan)

Prevention Through People Working Group

Margot Brown, chair
Nick Salcedo

Tug Escort Working Group

Joan Lundstrom, chair
Captain Margaret Reasoner (Rich Smith)
Stu McRobbie (Todd Covini)
Captain Doug Lathrop

Plan Update Work Group

Scott Merritt, chair

PORTS Funding Work Group

Scott Merritt, chair

EXECUTIVE SUMMARY 2002/2003 EXECUTIVE SUMMARY

The San Francisco Bay Region Harbor Safety Committee is concerned with navigation, environmental issues, and security issues that impact the San Francisco Bay Area. The committee met monthly at Richmond, Oakland, and San Francisco. In addition meetings were held for the first time at the U.S. Army Corp of Engineer's Bay Model in Sausalito, and the Coast Guard Island in Alameda.

The Harbor Safety Committee enjoys good member and public participation at its monthly meetings. The Committee is a fine example of government agencies, Federal and State, Private industry, and the Public working together to provide guidance in the formation and oversight of navigation safety in San Francisco Bay.

OSPR held Harbor Safety Committee Summit meetings in March and September 2002. The Chairman of each HSC in the state plus the OSPR Administrator and staff met to discuss committee updates and recommendations for the various HSC's in the state.

The Tug Escort work group met to review the current tug escort regulations for timeliness and to see if the original assumptions used were still valid. The review concluded with the work group recommending no changes to current regulations.

The Committee enjoys active participation of the U.S. Army Corp of Engineers, U.S. National Oceanic and Atmospheric Administration, and the United States Coast Guard Captain of the Port and Vessel Traffic Service. Without their assistance the committee would have a difficult time functioning.

Thru it's Prevention through People work group the Harbor Safety Committee is developing a video focusing on vessel navigation safety. This is a complex project with active participation from the work group members, OSPR, and the California Dept of Fish and Game.

In 2003 the Harbor Safety Committee created a Bylaws work group. The work group met weekly for six weeks to create a set of by-laws for the HSC to work under. The end result is a well organized and function document that will guide the committee in its business.

Since it's inception, The Harbor Safety Committee, through its work groups has adopted the following recommendations to reduce the risk of oil spills in the San Francisco Bay Region. Many recommendations have been implemented while others are still outstanding. The recommendations have been organized into "Yet to be Implemented" and "Implemented" sections. Each Chapter of the Harbor Safety Plan contains the complete text, background and status of each recommendation.

RECOMMENDATIONS YET TO BE IMPLEMENTED

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 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 that 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.

III. Aids to Navigation

No recommendations.

IV. Anchorages

V. Harbor Depths, Channel Design, and Dredging

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 dogleg 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 that 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

No recommendations**.**

IX. Bridges

1. OSPR should request Caltrans and other bridge operators such as the Golden Gate Bridge to install energy-absorbing fendering, instead of wooden or plastic fendering, on all area bridges when replacing damaged fenders and for all new construction.

X. Small Vessels

1. 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.

2. 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

No recommendations

XII. Tug Escort / Assist for Tank Vessels

No recommendations

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.

XIV. Underkeel Clearance and Reduced Visibility

1. The Committee recommended guidelines for underkeel clearances of tank vessels carrying oil or petroleum products as cargo.

XV. Economic and Environmental Impacts

No recommendations.

XVI. Plan Enforcement

No recommendations

XVII. Other: Substandard Vessel Inspection Program

No recommendations

RECOMMENDATIONS IMPLEMENTED

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. These recommendations have been implemented by the responsible agency.

I. Geographical Boundaries

No recommendations.

II. General Weather, Tides and Currents

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 Dumbarton 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 Dumbarton 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.

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.

VI. Contingency Routing

No recommendations.

VII. Vessel Traffic Patterns

No recommendations.

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

2. Bridge clearance gauges should be installed where needed, particularly drawbridges. *(Note: USCG requires bridge clearance gauges. Please notify CG District 11 Bridge Administration of any discrepancies)

3. Water level gauges should be installed at approach points to bridges. (Note: water level gauges are not under the jurisdiction of the USCG. However, proposals to install gauges or other items on bridges will require permission from the bridge owner, followed by review and approval from the CG District 11 to ensure permitted bridge structures are not altered without approval)

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. (Note: RACONS were installed some time ago. Please notify CG District 11 Bridge Administration of any discrepancies)

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. (Note: RACONS were installed some time ago. Please notify CG District 11 Bridge Administration of any discrepancies)

6. Request Caltrans and the Golden Gate Bridge District to shield bridge floodlights to reduce the glare for ships. (Note: Completed)

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 that 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.

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

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

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.

I. GEOGRAPHICAL BOUNDARIES

The policies and recommendations contained in the San Francisco Bay Harbor Safety Plan address vessel safety in the marine waters of San Francisco, San Pablo and Suisun Bays. For purposes of the Harbor Safety Plan, the eastern boundary includes those waters subject to tidal influence up to the Ports of Sacramento and Stockton. The western boundary of the plan is inscribed by a circle with a radius of six nautical miles (nm) centered on San Francisco Approach Lighted Horn Buoy SF (37° 45. 0'N., 122° 41.5'W) including the Main Ship Channel to the COLREGS demarcation line (see Map 1). This includes the Offshore Vessel Movement Reporting System, Vessel Traffic Service and Traffic Separation schemes within the area. The following NOAA charts cover the Harbor Safety Plan Area:

It should be noted the following plan elements apply to a smaller geographic area:

Vehicular Bridge Management: The westernmost boundary is the COLREGS Demarcation Line, between Pt. Bonita and Mile Rocks, and the easternmost boundary includes the Rio Vista Bridge over the Sacramento River and the Antioch Bridge over the San Joaquin River.

Tug Escort: The easternmost boundary of the tug escort area is one mile beyond the Ryer Island Ferry Terminal and on the San Joaquin River one mile beyond the Antioch Bridge. Tug escort zones are described in Chapter XII.

II. GENERAL WEATHER, TIDES AND CURRENTS

San Francisco Bay is the largest harbor on the Pacific Coast of the United States. It is made up of a series of connecting bays and harbors, of which San Francisco Bay, San Pablo Bay and Suisun Bay are considered jointly for the purposes of the San Francisco Bay Harbor Safety Plan. Most of the information presented here has been derived from the *U.S. Coast Pilot, Pacific Coast*. It is augmented with observations from local sources.

Ships traveling into the Bay encounter diverse weather, currents, tides and bottom depths. Because of the often varied and changing set of harbor conditions, mariners must be observant about up-to-date conditions to navigate safely. For example, while the heaviest rains occur in January and February, spring is the windiest season; fogs frequently shroud the narrow sea lanes around the approach to the Golden Gate Bridge and the Carquinez Strait; heavy rip tides and currents occur in the Central Bay; shoals may shift into navigation lanes. Knowledge of these factors is essential to understanding navigation in the Bay.

The movement of vessels in San Francisco Bay should be guided by certain general principles.

- The safe navigation of the vessel shall be the duty of the Master who shall have full command of the vessel, whether or not a Pilot is on board. With a Pilot on board, it shall be the duty of the Master and Pilot to fully comply with all safety and navigational provisions of applicable state, federal and international regulations for safe navigation.
- Nothing in the guidelines shall require a Master or Pilot to move any vessel in any condition unless the Master and the Pilot of the vessel agree that the movement can be safely accomplished.
- The decision-making process by the Master or Pilot shall consider all relevant factors, including, but not limited to:
    - ♦ The characteristics of the vessel, such as maneuverability, size and draft;
    - ♦ The quality of the vessel's radar capabilities;
    - ♦ Tide, current, and wind conditions on the intended route;
    - ♦ Time of the day in relation to whether the fog may be in a cycle of "burning off" or lifting;
    - ♦ Possible hazards along the route, such as bridges, and amount and nature of vessel traffic; and
    - ♦ Visibility conditions at the dock, en route and at the destination, and assessment of whether these conditions are changing.

- The Master and Pilot must be allowed the flexibility to cautiously proceed during periods of minimum visibility if deemed prudent based upon the Pilot's local knowledge of the Bay, including localized weather patterns, and the assessment of the factors outlined above in relation to the specific route to be taken.

WEATHER

1. Winds.

Bay area weather is seasonably variable with three discernible seasons for marine purposes.

Winter. Winter winds from November to February shift frequently and have a wide range of speeds dependent on the procession of offshore high and low pressure systems. Calms occur between 15 to 40% of the time inside the bay and 10 to 12% outside. Extreme wind conditions of 50 knots gusting to 75 knots have occurred during the winter. The strongest winds tend to come from the Southeast to Southwest ahead of a cold front.

Spring. Spring tends to be the windiest season with average speeds in the bay of 6–12 knots per *Coast Pilot*. Extremes are less likely than during the winter but wind speeds from 17–28 knot winds up to 40% of the time. Wind direction stabilizes as the Pacific High Pressure System becomes the dominant weather influence. Northwesterly winds are generated and reinforced by the sea breeze. Inside the Bay, winds are channeled and vary from Northwest to Southwest.

Summer. Summer winds are the most constant and predictable. The winds outside the Golden Gate are normally from Northwest to North and are generated by the strong Pacific High Pressure System. This condition lasts through October until the system weakens and the winter cycle starts again. Winds inside the Bay are local depending on the land contours acting on the onshore flow. One of the few occurrences that will alter this pattern is when a high pressure system settles over Washington and Oregon. When that happens a Northeast flow develops bringing warm dry air with it. This will clear away the summer fog.

Safety Issues Associated with Winds. Adverse wind conditions may cause ships at anchor, such as at Anchorage 9, to change position and drag anchor away from the intended mooring position. Winds in San Pablo Bay may be particularly strong and must be taken into consideration by tankers transiting to oil terminals along the Contra Costa County shoreline. Apparent significant discrepancies exist in the reported winds noted in the *Coast Pilot* and observations made by local professional mariners and recreational boaters. Possible causes for this are the locations of reporting sites on land where deflection and channeling of wind provides data at variance with conditions on the water.

2. Fog.

(See Chapter XIV. Underkeel Clearance and Reduced Visibility.)

TIDES AND CURRENTS

1. Currents.

The currents at the entrance to San Francisco Bay are variable, uncertain and at times attain considerable velocity. Immediately outside the bar is a slight current to the North and West known as the Coast Eddy Current. The currents that have the greatest effect on navigation in the bay and out through the Golden Gate are tidal in nature.

Golden Gate Flood Current. In the Golden Gate the flood or incoming current sets (direction of flow) straight in with a slight tendency to the North shores and with heavy turbulence at both Lime Point and Fort Point when the flood is strong. This causes an eddy or circular current between Point Lobos and Fort Point.

Golden Gate Ebb Current. The ebb or outgoing current has been known to reach more than 6.5 knots between Lime and Fort Points. It sets from inside the North part of the Bay toward Fort Point. As with the flood, it causes an eddy between Point Lobos and Fort Point, and a heavy rip and turbulence reach a quarter of a mile south of Point Bonita.

Golden Gate Current Maximums. In the Golden Gate the maximum flood current occurs about an hour and a half before high water, with the maximum ebb occurring about an hour and a half before low water. The average maximums are 3 knots for the flood and 3.5 kts for the ebb.

Inner Bay Currents. Inside the Golden Gate the flood sets to the Northeast and causes swirls and eddies. This is most pronounced between the Golden Gate, Angel Island, and Alcatraz Island. The current sets through Raccoon Strait (north of Angel Island) taking the most direct path to the upper bay and the delta area. The ebb current inside the Golden Gate is felt on the South shore first. The duration of the ebb is somewhat longer than the flood due to the addition of runoff from the Sacramento and San Joaquin River systems.

2. Tides.

Tides in the San Francisco Bay Area are semi-diurnal in that there are usually two cycles of high and low tides daily but with inequality of the heights of the two. Occasionally the tidal cycle will become diurnal (only one cycle of tide in a day). As a result, depths in the Bay are based on “mean lower low water” (MLLW) that is the average height of the lower of the two daily low tides. The mean range of the tide at the Golden Gate is 4.1 feet, with a diurnal range of 5.8 feet. During the periodic maximum tidal variations the range may reach as much as 9 feet and have lowest low waters 2.4 feet below mean lower low water datum.

Safety Issues Associated with Current and Tide Conditions. In late 1991, the National Oceanic and Atmospheric Administration (NOAA) stopped publishing the local tidal current charts from use due to significant errors in predictions and because the errors exceeded NOAA standards. Because of the variable depths of the Bay, safe navigation is highly dependent upon accurate tidal and current charts.

PORTS has been installed to give near-real time tide and current information on a six-minute basis. This is one of the more modern systems in the nation. PORTS is managed by the Marine Exchange with funding from OSPR and technical assistance from NOAA/NOS.

Recommendations

II.1. Physical Oceanographic Real-Time System (PORTS). 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 that 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. (May 1999) The committee submits that this recommendation is still valid.

> **STATUS.** The Physical Oceanographic Real-Time System continues to be of great benefit to recreational boaters, commercial shippers, vessel masters and pilots in providing accurate knowledge of winds, currents and other environmental parameters used by the San Francisco maritime community.
>
> The P.O.R.T.S. information hub, called the InfoHub, was installed in April 1997 and provides many value-added, user-friendly website screens that display the P.O.R.T.S. data in various modes and scales. Data to the information hub is first quality-controlled at the Data Acquisition System (DAS) located in Vallejo.
>
> The data is the quality-controlled automatically and in much greater detail on a 24-hour/7-day per week basis under a program called the Continuous Operating Real-Time Monitoring System or CORMS. CORMS employs knowledgeable oceanographers at NOAA'' National Ocean Service headquarters in Siler Spring, Maryland that monitor data quality and sensor performance using data quality control tests and remote sensor and DAS diagnostics. Bad data is not posted but is replaced by the most current correct value.

Management of the P.O.R.T.S., including administrative, field maintenance and repair and the information hub was handed over to the Marine Exchange of the San Francisco Bay Region, located at Lower Fort Mason Center in San Francisco. The PORTS Advisory Committee has made a recommendation to request general state funding to continue operating the system.

Access to PORTS information may be obtained by logging onto the website at http://www.sfmx.org. The same information may be obtained by contacting the voice response number *(866) 727-6787.*

SPEED OF VESSELS

The San Francisco region is well known for occurrences of dense fog. San Francisco had an average of 60 to 70 foggy days per year when visibility was less than one half mile. Of the major ports in the United States, the Bay has the highest number of foggy days. In contrast, San Diego Harbor experiences fog an average of 24 days a year. In addition to hazards created by weather, tide and current, and depth conditions, vessels must transit under a number of major bridges. In the Central Bay, where vessel traffic is heaviest, vessels must make abrupt movements to navigate around Alcatraz Island or transit under the Bay Bridge to the Port of Oakland.

The Coast Guard Marine Safety Office San Francisco Bay proposed that maximum speed limits be set for vessels in the Bay to improve safe navigation. The Vessel Traffic Service (VTS), in a two-week survey in 1993, noted three large commercial vessels traveling at speeds between 18 to 20 knots within the Central Bay, which was considered excessive, taking into consideration the narrow confines of the shipping lanes, the distance required for large vessels to stop, the many hazards and the number of other vessels generally present such as commercial ships, ferries, recreational boaters, tugs, etc. In May 1993, VTS tracked the speed of 206 vessels inbound and outbound within the Central Bay, which included tankers, ships and tugs with tow. From this sample, it was concluded that the vast majority of vessels were traveling 15 knots or less.

The Captain of the Port approached the Harbor Safety Committee and requested that the Committee formally comment. After a number of public meetings, the Committee agreed that maximum speed limits should be established for the main ship channels based on the operating characteristics of ships transiting in the Bay. For example, industry related that lower speeds, such as a 12 knot limit, would unnecessarily restrict the maneuverability of some ships in swift currents. Also certain ships can operate only in ranges of full speed and ahead half which may not coincide with an upper speed limit. Taking this information into consideration, the Harbor Safety Committee endorsed the 15 knot speed limit. In addition, the committee recommended that all vessels be in a response mode that would not delay an immediate reaction to an engine order. It was agreed the speed proposed was the maximum speed of an independently operated vessel. Vessels required to be escorted would still be governed by the speed at which assistance could be rendered as outlined in the tug escort regulations.

Recommendations

II.2. Maximum Speed. 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:

1) 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 Union Pacific Railroad Bridge.

2) 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.

> **STATUS.** Federal regulation 33 CFR Parts 162 and 165 became effective May 3, 1995, limiting vessel speed to 15 knots for power driven vessels of 1,600 or more gross tons within the main ship channels (Regulated Navigation Areas) of San Francisco Bay. This also applies to a tug with a tow of 1,600 or more gross tons. The regulation implements the Harbor Safety Committee recommendation of setting a maximum speed limit on vessels to improve safe navigation within the congested areas of the Bay where the ability of a vessel to maneuver in the event of an emergency is severely constrained. No further action is necessary.

III. AIDS TO NAVIGATION

The waters of the San Francisco Bay Area are marked to assist navigation by the US Aids to Navigation System. This system encompassed buoys and beacons conforming to the International Association of Lighthouse Authorities. The US Aids to Navigation System is intended for use with nautical charts. The exact meaning of a particular aid to navigation may not be clear to an individual unless the appropriate nautical chart is consulted. Additional important information supplementing that shown on charts is contained in the *Light List, Coast Pilot* and *Sailing Directions.*

In 1992, the Coast Guard, working with the Harbor Safety Committee, thoroughly reviewed the layout and marking of the main ship channels. This review, known as the Waterway Analysis and Management System Study (WAMS), was conducted under the auspices of the Marine Safety Office and involved pilots and industry representatives. As a result of this review, the layout of the main ship channels was significantly changed by the substitution of precautionary areas for the pre-existing two-way Traffic Separation Scheme (TSS) in many parts of the Bay. The traffic routing scheme was originally established in 1972. The revised routing scheme reflects current traffic patterns and corrects the problems of contrary vessel movements noted in the Harbor Safety Plan.

The revised traffic routing scheme established a deep-water traffic lane, a precautionary area between the main ship channel traffic lanes and the deep water, and Central Bay traffic lanes, and expanded the Central Bay precautionary area. The northern traffic lanes are redesigned (narrow) channels and the separation zones in the channel deleted. The Coast Guard established Regulated Navigation Areas for the San Francisco Bay, and the ship channels of Oakland Harbor, Richmond Harbor/Southampton Shoal Channel, North Ship Channel, San Pablo Straight Channel, Pinole Shoal Channel and the channel under the Union Pacific Railroad Bridge in the Carquinez Strait. In addition to the hazards posed by rocks both above and below the water, area bridges create an additional challenge when navigating in the Bay. There are twelve racons on bridges in the Bay Region. This is of major importance because racons are invaluable for precise radar navigation particularly in fog, which is common to the Bay. Racons appear on radar screens as large coded signals extending in an arc behind the racon position. When placed on the center span of bridges, the mariner can align the ship directly under the center of the span, even in limited visibility. The Harbor Safety Committee emphasized the importance of racons on bridges (See Chapter IX, *Bridges,* for recommendations on racons).

A light marks most of the rocks in the Bay. A lighted buoy and a racon mark Harding Rock, a submerged rock near a main shipping area off of Alcatraz Island. Harding Rock is the submerged rock nearest the deep-draft shipping lane to the west of Alcatraz Island. Arch and Shag Rocks, which are submerged near Harding Rock, are unmarked. The Coast Guard determined that it was not necessary to mark these rocks as they are well outside of the shipping channel. In 1987, a container ship sustained extensive damage to its hull by passing over Arch Rock. In September 1996, the Coast Guard established the San Francisco Bay North Channel Lighted Buoy 1 in position 37-49.9N, 122-24.5W to mark the shoal east of Alcatraz Island for deep-draft vessel traffic. (Reference Local Notice to Mariners #38/96). Southern Channel rebouyed to better mark deep-water channel for laden tankers 12/00.

As a result of the tragic accident on Big Bayou Canot in the southern United States where a barge caused a railroad bridge to collapse, the Federal Department of Transportation directed the Coast Guard to inspect bridge navigation lights and fendering systems on all bridges that commercial vessels can reach. In the San Francisco Bay/Delta, 106 bridges were inspected. Almost two-thirds had some discrepancy, primarily minor navigation light outages. Almost all discrepancies have been corrected.

IV. ANCHORAGES

Because of the extent of the Bay, a number of federally designated anchorages have been established in the San Francisco, San Pablo, and Suisun Bays and the San Joaquin and Sacramento Rivers. The *Coast Pilot*, lists the area's anchorages and limitations.

Within the Anchorage 9 area, lightering of tankers and bunkering of vessels occurs.

Because of the number of active military bases that were situated around the Bay, the Coast Guard established several explosive anchorages, primarily within Anchorages 5 and 9 (see Map 1). Explosive Anchorage 14, within General Anchorage 9, was realigned in 1997 to provide deeper water for vessels with drafts of 38 feet or greater, laden with explosives, to safely anchor. This also minimized potential overcrowding of vessels anchored within General Anchorage 9. The anchorages are used at specified times for ammunition ships, such as during the recent Persian Gulf War. Notice of activation of an explosive anchorage is made in the Coast Guard Notice to Mariners to advise vessels not to anchor within the area while vessels are loaded with, loading or unloading explosives.

Recommendation

IV.1. 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 with due consideration for pilot and vessel master concerns.

> **STATUS.** Anchorage No. 9 has been divided in two areas: the western side has been designated for deep draft vessels and the eastern side for lighter draft vessels. In addition, current instructions require that vessels not anchor closer than 750 yards from one another. In response to users' requests, VTS–San Francisco issued revised instructions to increase the distance between vessels at anchor to about 1,000 yards as general practice, but in no case less than 750 yards.
>
> No further action is necessary.

V. HARBOR DEPTHS, CHANNEL DESIGN, AND DREDGING

San Francisco Bay is one of the world's greatest natural harbors. The tributary of rivers and streams that empties into San Francisco Bay carry large quantities of silt into the harbors and shipping channels of the Bay. Therefore, channel depths must be regularly maintained and shoaling must be prevented in order to accommodate deeper draft vessels. Maintenance dredging accounts for approximately 5,000,000 cubic yards of sediments dredged from the San Francisco Bay, Sacramento and San Joaquin ship channels. Beginning in 1868, Congress passed the River and Harbor Act and the federal government began dredging a channel to create a main ship channel in the approaches to San Francisco Bay. Actual channel depths may vary from project depths and must be checked with the most recent hydrographic surveys. Presently the project depth of the main ship channel from the Pacific Ocean into the Bay is 55 feet deep and 2,000 feet wide (U.S. Army Corps of Engineers, 1991). However, continual sedimentation flowing out of the river systems into the ocean reduces the main channel from its authorized depths. According to the U.S. Army Corps of Engineers, there are no current plans to change the entrance channel's authorized width or depth within the next decade. The depth of the main channel limits the draft of vessels able to enter the Bay.

During the past century the federal government deepened a number of shipping channels, removed various shoals, and reduced rocks near Alcatraz Island. Present channels leading to the various Bay Area ports are at project depths ranging from 35 feet MLLW to 45 feet MLLW.

To the north, navigation channels in San Pablo Bay and Mare Island Strait have been improved by the federal government beginning in 1902 (U.S. Army Corps of Engineers, 1991). A 600-foot wide, 11-mile long channel, with an authorized project depth of 35 feet, extends through San Pablo Bay to Carquinez Strait. The Suisun Bay Channel in the Carquinez Strait has a project depth from 30 to 35 feet. To the east the Suisun Bay Channel is 35 feet deep to the mouth of the New York Slough.

Deep draft vessels in the Bay must carefully navigate many of the main shipping channels because channel depths in some areas are just sufficient for navigation by some of the modern larger vessels, depending upon how deeply laden the vessel is. Groundings have been reported mostly in the Sacramento and San Joaquin River Channels and near the Southampton Shoals. Due to the narrow width of most channels, groundings cause serious delays to vessels requiring transit through the blocked channel or shoaled area. In addition, groundings can damage vessels and may lead to associated risks, such as flooding and oil spills. There are submerged rock outcroppings in the Bay where groundings might split open the hull of a ship. More importantly, the maneuvering of deep draft ships in channels with marginal depths may pose higher navigational risks, given the complexities of tides, currents, and weather conditions in the Bay.

Surveys. Specific areas with high interest levels are surveyed on a frequent basis. Even charts based on modern surveys may not show all seabed obstructions or shallow areas due to mobile bottoms (localized shoaling). The variable hydrodynamics of the Bay estuary reflect a variety of factors such as drought and flood cycles, dredging projects, and in Bay dredge disposal that may affect navigation channels. It is possible that strong seismic events may result in changed geomorphology within the Bay due to liquefaction and lateral spread. Recent observations have indicated that manmade channels may be influencing tidal currents to a greater degree than anticipated with consequent effect on sediment accretion. There are additional indications that not as much dredged material deposited in the Alcatraz dump site may be making its way to sea as estimated, causing alterations in the bottom topography and silt recirculation in the north and middle San Francisco Bay regions. (It is thought that a recent shoal near the navigation channel east of Alcatraz Island may be caused by the migration of dredge material initially deposited at the Alcatraz dumpsite, which is southwest of the island.) *What is the basis for this last statement? Depths of 42-50 ft in the area bounded by Alcatraz Island, Blossom Rock, Pt Blunt (Angel Island) and the shoal north of Yerba Buena Island (Treasure Island) appear in the 1859 survey of the Bay by CPT W.R Palmer, Coast Survey Office.*

Navigational Issues Associated with Channel Design and Dredging. Harding, Shag, and Arch rocks are large submerged rocks located approximately one to one and a quarter nautical miles northwest of Alcatraz Island. The tops of the rocks are 36, 37, and 33 feet respectively below the surface of the water at Mean Lower Low Tide (MLLW). The submerged rocks are within the outbound navigation lane of the shipping channel that passes north of Alcatraz Island that is designated one way for vessels going out to sea. Inbound vessels sail south of Alcatraz Island. However, ships with a draft of more than 38 feet sail north of Alcatraz in the outbound navigation lane in order to maintain safe depths in the deeper waters within this area. Blossom Rock is located approximately 1 nautical mile to the southeast of Alcatraz Island, posing a potential hazard to navigation for deep draft vessels transiting Central San Francisco Bay and South of the San Francisco/Oakland Bay Bridge. The top of Blossom Rock is 40 feet below the surface of the water at MLLW. Harding, Arch, Shag and Blossom Rocks were lowered some decades ago for the shipping lanes, but today's large tankers and container ships have deeper drafts and now must avoid the submerged rocks. Lowering the rocks to accommodate the most modern ships would help create sufficient depths for a new two-way navigation lane north of Alcatraz Island, as well as provide a greater margin of safety for vessels transiting the area between Alcatraz and Treasure Islands.

In addition to the problem of insufficient channel depths near the submerged rocks off Alcatraz Island, channel depths in an area south of the Richmond–San Rafael Bridge pose a hazard to navigation. The West Richmond Channel is a segment of the Baldwin Ship Channel located a few miles south of the Richmond–San Rafael Bridge where ships maneuver to transit under the bridge, sailing north principally to the refineries along the Contra Coastal and Solano County shorelines. The concern is to have sufficient channel width to line up a vessel to clear the supports of the Richmond–San Rafael Bridge. If the "dog leg" were dredged at this time to 35

feet, the Corps of Engineers estimates that minimal dredging would be involved, as much of the area in question is now at that depth.

The frequent shoaling and silting in the channels of the San Francisco Bay and its tributaries require channel surveys to be conducted on a routine basis. These surveys, combined with regularly scheduled dredging of major ship channels, will provide better information on actual channel depths, maintain project depth and reduce the risk of vessel groundings. Emergency surveys should be conducted when there is evidence that shoaling has occurred. Emergency dredging should be conducted as appropriate when shoaling is discovered.

Recommendations

V.1. Operators Surveys. The Committee concurs with the U.S. Coast Guard that, in addition to the NOAA surveys, facility owners/operators should conduct annual condition surveys noting depths alongside and at the head of their facilities. These surveys should be conducted in accordance with standards set by NOAA and finalized at the end of the year for chart and publication updates. Additional information by NOAA should reflect local pilotage issues such as currents, tidal ranges, depth of water needed to safely navigate to and alongside facilities and piers, unique meteorological conditions and aids to navigation maintained by the facility. The most updated information should be published in the *Coast Pilot* to reflect changed conditions, particularly relating to hazards to navigation.

STATUS. No further action is necessary.

V.2. Surveys. 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 and where changes in bottom contours have been reported to differ by more than two feet from NOAA charts. Such areas would include shoaling areas east of Alcatraz and west of the Oakland Harbor. The Committee urges that NOAA permanently assign a field survey schedule of areas identified by pilots as subject to shoaling.

V.3. Charts. The Committee further recommends that NOAA update its charts in a timely fashion to reflect survey information from NOAA, COE and independent sources. When surveyed channel depths vary more than one foot from a NOAA chart, such information should be provided to VTS (Coast Guard), masters and pilots of deep-draft vessels as soon as available. 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.

STATUS OF SURVEYS AND CHARTS. Charts 18645, 18649,18650, 18653, 18654, 18655 and 18657 have been designated for priority maintenance by NOAA in 1997 (Figure 1). These charts were placed on an accelerated updating and publication schedule (every 6 to 12 months) at that time. See Figure 1 for a schedule of the updated editions.

San Francisco Bay NOAA Nautical Charts

Figure 1.

	chart number	chart edition	chart date	date next edition	chart scale	chart title
1	18640	23	22-Mar-97	***	1:207,840	San Francisco to Point Arena
2	18645	23	26-Apr-97	***	1:100,000	Gulf of the Farallones
3	18649	59	26-Apr-97	1-Dec-99	1:40,000	Entrance to San Francisco Bay
4	18650	47	5-Apr-97	1-Jun-00	1:20,000	S.F. Bay: Candlestick Pt. to Angel Island
5	18651	40	29-Jul-95	***	1:40,000	S.F. Bay: Southern Part
6	18652	29	16-Aug-97	1-Apr-00	1:80,000	Small Craft Chart: S.F. Bay to Antioch
7	18653	8	17-Jul-99	***	1:20,000	S.F. Bay: Angel Island to Pt. San Pedro
8	18654	39	28-Sep-96	1-Nov-99	1:40,000	San Pablo Bay
9	18655	55	26-Oct-96	1-Jul-00	1:10,000	Mare Island Strait
10	18656	50	8-Aug-92	***	1:40,000	Suisun Bay
11	18657	17	3-Jul-99	***	1:10,000	Carquinez Strait
12	18658	29	13-Mar-99	***	1:10,000	Suisun Bay: Roe Island and Vicinity
13	18659	12	3-Feb-96	1-Oct-99	1:10,000	Suisun Bay: Mallard Island to Antioch
14	18660	1	25-Sept-99	***	1:40,000	San Joaquin River, Antioch to Medford I

15	18661	24	17-Jan-98	1-Oct-99	1:40,000	Sacramento and San Joaquin Rivers
16	18662	18	23-May-92	1-Nov-99	1:40,000	Sacramento River
17	18663	3	25-Jul-92	1-Oct-99	1:20,000	Stockton Deep Water Channel
18	18664	11	4-Jul-92	1-Apr-00	1:20,000	Sacramento to Colusa
19	18680	28	5-Jul-97	1-Jun-00	1:210,668	Point Sur to San Francisco

*** Not in the FY2000 chart plan. The FY2000 chart production plan calls for printing 222 new editions.

NOAA's Office of Coast Survey (CS) has designed this chart maintenance plan to provide support for the nation's largest commercial ports and trade routes. Selection of these ports and routes is based upon the tonnage and value of goods moving through them. NOAA's increased budget will permit the compilation, printing and distribution of 360 new editions in Fiscal Year 1998 and 360 new editions in Fiscal Year 1999. Annual production of 400 new editions is necessary to maintain NOAA's entire national suite of nautical charts in a state of currency. Under previous manual chart compilation methods, a typical chart was compiled in about 30 weeks. Automation has reduced this time requirement to around 8 weeks per chart.

Raster Chart Products: NOAA has been active in developing electronic charts products. NOAA's entire suite of 1,000 nautical charts are available in raster format from nautical chart agents. Over 1.2 million electronic charts have been sold since their release in 1996. There are 75 software developers that have produced 25 different navigational software applications utilizing these raster chart images.

Print-on-Demand Charts (POD): POD charts are just around the corner pending the establishment of regional printing locations for the first phase of the project. The POD allows CS to update charts immediately and electronically transmit the updated information to users. A means to update raster charts by the user is still in the works. The user will be able to download Notice to Mariner corrections and other chart corrections from the internet website or bulletin board that can be merged with the existing file (on CD-ROM or other media) using a "raster-differencing" application that in essence performs a pixel-by-pixel comparison between the existing chart and corrections to produce an updated chart version. Beta testing of this experimental process is still in progress.

Vector-Based Charts: NOAA is building a data base to produce an accurate and detailed vector electronic navigational chart (ENC) for major U.S. ports and shipping lanes. The vector charts will include "active" information on navigationally significant features such as aids to navigation, bridges, anchorages, obstructions, wrecks, rocks, cables, traffic separation schemes, pipelines, platforms, cautionary and dredged areas. NOAA has created a prototype vector-based chart for the area of Sault Ste. Marie, in the Great Lakes and is working on the areas of the Mississippi River.

CS plans to complete the data collection process for major U.S. ports and shipping lanes by the end of 1998. Plans are still in the works for producing several ENC's in San Francisco Bay.

Hydrographic Surveys: NOAA began contract hydrographic surveys in the Bay in April 1999. The areas to be surveyed include three areas in Carquinez Strait, the south bay--Anchorage 9 and a re-survey of the areas shoaling northeast of Alcatraz Island. Survey priorities are typically identified through the HSC Navigation Work Group.

V.4. Underwater Rocks. Establish a new two-way Traffic Separation Scheme north of Alcatraz to allow safer navigation of deeply laden tankers and container ships. Several areas, such as Harding, Arch, Shag and Blossom 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:

Complete the ongoing Feasibility Study associated with the Federally authorized San Francisco Central Bay Rock Removal Project.

- 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.

- **BACKGROUND:** In 1992, the Harbor Safety Committee recommended that the submerged rocks off Alcatraz Island should be lowered to a minimum of 55 feet MLLW to reduce the risk of a major oil spill from tankers. At the request of the Committee and the Coast Guard, the U.S. Army Corps of Engineers undertook an initial study of the feasibility of lowering the rocks. The report, entitled *Rock Removal Interim Report, Initial Appraisal, April, 1994* analyzed the economic feasibility, the operational considerations, and the probable environmental impacts which might result from the lowering of the rocks to -55 feet MLLW. The Corps report focused on the lowering of Harding, Shag, Arch, and Blossom Rocks, an unnamed rock west of Arch Rock and a portion of Alcatraz Shoal, which were identified as major hazards to navigation, especially to deep draft oil tankers. Approximately 20% of the inbound tankers have drafts in excess of 38 feet. Harding, Arch, Shag and Blossom Rocks rise to within approximately 35-40 feet of the surface of the water. However, the Harbor Safety Committee decided to pursue the matter further because the rocks are dangerously close to the narrow routes traveled by the deepest draft tankers and ships (See Appendices for the location and isometric profile of the rocks). If a loader tanker became disabled close to the underwater rocks, a tug escort may be ineffective in keeping the vessel off the rocks. An Underwater Rocks Work Group was appointed by the chair of the Harbor Safety Committee consisting of representatives of the Coast Guard Marine Safety Office, San Francisco Bar Pilots, Vessel Traffic Service (VTS), State Lands Commission, Port of Oakland, U.S. Army Corps of Engineers, and the San Francisco Bay Conservation and Development Commission (BCDC). The group's goal is to identify navigational safety and environmental issues, costs, construction alternatives, funding sources and possibly recommending a prioritized list of lowering the rocks according to risk and benefit. In October 1996, an oil spill occurred in Central San Francisco Bay from a ship in dry dock at Pier 70, San Francisco. Over 8,000 gallons of oil spilled and spread by a winter storm, fouled marinas, piers, and beaches, mainly along the San Francisco waterfront. The spill killed or injured scores of water birds in the Central Bay. Known as the Cape Mohican Spill, clean-up over a two-month period cost $10 million - for a relatively minor amount of oil on the water. The spill, visible to many thousands of people around the Bay and widely publicized in the media, lead to renewed public interest in preventing vessel accidents that might cause spills in the Bay. The hazardous underwater rocks off of Alcatraz Island were compared to the rocks in Prince William Sound, which ruptured the tanker EXXON VALDEZ, with well-known, catastrophic results to the environment. As a result of this focus, in late February 1997, Congressman George Miller from Contra Costa County proposed federal legislation to lower the rocks to 55 feet below the low tide mark. Miller's legislation, called the San Francisco Bay Shipping and Fisheries Enhancement Act, or BaySAFE, is based on initial studies by the US Army Corps of Engineers, the US Coast Guard, and the Underwater Rocks Work Group report on navigation safety issues. The bill (HR 882) authorizes 100% federal funding for a Corps of Engineers' $100,000 reconnaissance study of the rocks; a $2-3 million feasibility engineering study; and $28 million for construction and mitigation that is also dependent upon local matching funds. A Feasibility Cost Sharing Agreement between the Corps and the California State Lands Commission was signed in March 2000. The State of California has provided matching funds through the State Lands Commission. Federal funds have been allocated for the feasibility study for the project. The results of the

Feasibility Study will be a report documenting existing conditions, risks and benefits, alternatives, environmental impacts, potential mitigation, costs, recommendations for further planning, engineering, design and real estate activities. The Feasibility Report is required to provide a basis for a decision on Federal participation in the construction of the Project. An Environmental Impact Statement/Report and Design Memorandum will be prepared as a part of the Study.

STATUS. **The Corps of Engineers is in the process of conducting the Feasibility Study** associated **with the Federally authorized San Francisco Central Bay Rock Removal Project. The purpose of the project is to take actions to prevent groundings on the rock mounds in Central San Francisco Bay near the existing deep-draft channels. The prevention of groundings could significantly reduce the risk of oil and fuel spills from occurring in the Central Bay. These actions would further serve to improve navigational safety and reduce significant environmental and economic damages within all of San Francisco Bay. The Feasibility Study will include ongoing and completed technical investigations, environmental documentation, alternative analysis, potential mitigation measures, costs, and economic analysis. The feasibility study is currently scheduled to be completed during the summer of 2003. Re-examine East Alcatraz Shoal. The Corps of Engineers has agreed to evaluate the forty-foot shoal south of the Bay Bridge under the authority of San Francisco Harbor maintenance dredging. NOAA will continue to survey the position of two charted wrecks one located near Blossom Rock and the other near the Bay Bridge.**

V.5. Dredge Dog Leg at Buoy "C". Eliminate the dogleg 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.

STATUS. In 1993, the Harbor Safety Committee deleted the recommendation to dredge the dog leg at buoy "C" of the San Rafael main ship channel, but retained the statement that: "This recommendation, along with all others in this Plan, should be the subject of a complete environmental analysis and examination of alternatives before implementation."

The Coast Guard has eliminated traffic lanes. Re-analysis of this recommendation indicates there is no substantial danger to vessels in retaining the dogleg configuration. Pilots must make passing arrangements in order to use the deep-draft portion of the channel. The Corps of Engineers concluded that the bend serves to direct vessels away from the Tiburon Peninsula, reducing the danger of grounding and increasing the maneuvering room for multiple vessel movements.

VI. CONTINGENCY ROUTING

The high concentration of ship transits plus the concentration of population and facilities around the Bay requires many dredging and construction projects to occur on a frequent basis. The committee reviewed current procedures for routing vessel traffic during construction and dredging operations.

A number of activities on the Bay may impact the routing of vessels, namely dredging and construction. Dredging of the shipping lanes is essential for safe navigation to the ports and marine terminals because so much of the Bay is shallow and subject to sedimentation. Therefore, maintenance dredging occurs on an ongoing basis. In addition, major projects to deepen the Baldwin Ship Channel and various ports have taken place to accommodate the modern deep-draft vessels. Six major bridges span Bay shipping lanes. Ongoing maintenance of bridge fenders occurs. Projects are proposed to strengthen the supports of several bridges for seismic safety. Within the next ten years, CalTrans proposes to construct a new parallel bridge between Benicia and Martinez spanning the Carquinez Strait shipping channel, a new Carquinez Bridge, and a new parallel Bay Bridge span is proposed. Maintenance work and new work on the bridges may impact navigation lanes.

Typically, the construction process proceeds as follows:

· During early planning stages of a project that might impact the navigation of vessels, the project proponent consults with affected pilot organizations, the US Coast Guard, affected port authorities, and appropriate agencies to assure that consideration is given to the safety of navigation and temporary or permanent restrictions that may impact the movement of vessels.

· During the construction planning stages of channel dredging projects and construction projects that may impact the navigation of vessels, representatives from the affected pilot organizations, the US Coast Guard, and affected port authorities attend pre-construction conferences to ensure that procedures and communications with vessels and pilots as well as any restrictions proposed to be placed on the movement of vessels.

· During construction or dredging projects that may impact safety of navigation of vessels, representatives of affected pilot organizations, the US Coast Guard and the affected port authorities attend weekly progress meetings to ensure that up-to-date information is available to vessels and pilots. Frequent meetings enable the close coordination, which is sometimes required to allow the project to proceed smoothly without adversely affecting the safe movement of vessels.

The Captain of the Port has authority under the Ports and Waterways Safety Act to direct vessel movement in case of emergency to ensure the safety of the Port and navigation. The Captain is empowered to create safety zones and to exclude vessel traffic in the event of an oil spill or other disaster or emergency.

Recommendation

VI.1 Contingency Routing. The high degree of cooperation and consultation between pilot organizations, the US 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.

> **STATUS.** In order to reduce chances of accidents and catastrophes occurring during construction of harbor, dredging and waterway modification projects, the long-standing permitting procedures of the U. S. Coast Guard, theSan Francisco Bay Conservation and Development Commission, the U. S. Army Corps of Engineers, the U. S. Environmental Protection Agency, and the San Francisco Bay Regional water Quality Control Board should be specifically referenced as mandates. Contractors must be responsible for informing the US Coast Guard in advance of their planned and actual construction so that the Coast Guard may advise and establish Safety Zones and/or provide cautionary notices and/or rerouting orders to mariners. A Safety Zone is a directive concerning a water area, a shoreline area, or a combination thereof to limit access to authorized vessels. The Captain of the Port is authorized to establish temporary safety zones. Planning for alternate contingency routing during a construction project is not the responsibility of the Harbor Safety Committee.
>
> Project planning and engineering are underway for seismic retrofitting of various major bridges in San Francisco Bay. Consistent with this recommendation, close coordination has occurred between the Coast Guard, CalTrans, project contractors, the San Francisco Bar Pilots, and representatives of the Harbor Safety Committee to ensure safety of navigation.
>
> Seismic retrofit work is occurring, or will soon occur, at almost all major highway bridges. The activities will affect mariners on a daily basis for several years. The Coast Guard, with input from the Harbor Safety committee, has worked with the bridge owners and contractors to develop guidelines for construction activity on those bridges. The Coast Guard Marine Safety Office will review the plans for mooring construction equipment at bridge sites to ensure a safe path for navigation. Bridge owners are responsible for ensuring that reliable communications exist between the bridge, the Coast Guard Vessel Traffic Service and transiting vessels so they can pass information about the location of construction equipment or other factors affecting navigation.

The Eleventh Coast Guard District, Bridge Section will provide information about bridge activities via telephone, letter, Local Notice to Mariners and Broadcast Notice to Mariners as appropriate. Significant bridge projects presently underway in the Bay Area are as follows:

- The San Francisco-Oakland Bay Bridge, seismic retrofit is in progress west of TI/YBI with few impacts to navigation. The proposed replacement of the east section of the bridge is in progress. A construction plan was required for coordination of navigational issues, before bridge construction began. The reasonable needs of navigation are being met during the work. Updates continue via Local Notices to Mariners and Broadcast Notices to Mariners.

- The San Mateo-Hayward Bridge, seismic retrofit has been completed.- The Richmond-San Rafael Bridge seismic retrofit is in progress, both in and out of the navigational channel spans. The reasonable needs of navigation are being met during the work. Updates continue via Local Notices to Mariners and Broadcast Notices to Mariners.

- The Carquinez Bridge replacement and seismic retrofit projects are in progress. Demolition of the existing (downstream), bridge will require advance planning and coordination, prior to Coast Guard approval. Brief channel closures should be expected during the demolition. The reasonable needs of navigation are being met during the work. Updates continue via Local Notices to Mariners and Broadcast Notices to Mariners.

- The Benicia-Martinez bridge seismic retrofit is completed. - The proposed new Benicia-Martinez Bridge is under construction. The reasonable needs of navigation are being met during the work. Updates continue via Local Notices to Mariners and Broadcast Notices to Mariners.

- The Rio Vista drawbridge seismic retrofit is complete. General information excerpts from the Monthly Local Notice to Mariners:

GENERAL - NORTHERN CALIFORNIA - REDUCED BRIDGE CLEARANCES DUE TO HIGH WATER. Mariners are reminded that recent heavy rain and high flows may result in reduced vertical and horizontal navigational clearances through bridges. Flotsam and drift may be accumulating on bridge piers and abutments. Mariners should approach all bridges with caution and due consideration to existing navigational conditions. Notification of bridge-related discrepancies during normal working hours should be provided to the Eleventh Coast Guard District Bridge Section by telephone at (510) 437-3514. During non-working hours, nights, weekends, and holidays, notification should be provided to the cognizant Coast Guard Command duty watch stander via marine radio, or telephone, to ensure appropriate notices to mariners.

GENERAL - SAFETY AT BRIDGE CONSTRUCTION SITES. Most bridges in the San Francisco Bay Area are undergoing seismic retrofit. Construction and retrofit activities at these bridges will involve the use of scaffolds, temporary trestles, and marine construction equipment. General information about construction activities will be provided in the weekly publication of this Local Notice to Mariners. Immediate information will be provided by Broadcast Notice to Mariners. On some projects, mariners may contact the bridge via marine radio Channel 13 in advance to determine conditions at the bridge, and if necessary, have scaffolding moved for safe passage of navigation. Commercial vessels may be asked to provide their "air draft" and their vertical clearance requirement directly to the bridges or to VTS to assist the bridges in anticipating the need for moving scaffolding. Mariners are advised to transit the work site with minimum wake to ensure safe working conditions at the bridge

The cooperation of the navigation community during essential bridge work is greatly appreciated.

VII. VESSEL TRAFFIC PATTERNS

Ship Traffic

A wide variety of commercial, military and government vessels enter, exit and transit the Bay. Many vessels such as barges and small tankers remain entirely within the Bay due to the shallow depth of much of the Bay and the distances between facilities. Full container ships, oil tankers and bulk carriers account for the greatest percentage of ship arrivals. Other categories of ships include vehicle carriers, break bulk, chemical tankers, and passenger ships. Occasionally, surface combatants, naval auxiliaries such as oil tankers, supply ships, and submarines make calls at this harbor. Government vessels include those of the United States Coast Guard, the Army Corps of Engineers, and NOAA.

The precise amount of oil shipped annually into and within the Bay is difficult to determine. Federal staff responsible for carrying out the Oil Pollution Act of 1990 has studied U. S. ports where high volumes of oil were moved. Based on an analysis of oil transits in United States ports during the past five years, San Francisco Bay ranked seventh in the volume of oil transported. In comparison, Los Angeles/Long Beach Harbor ranked fifth in the United States in this category. Another measurement of oil movement was a weighted index of oil volumes and vessel traffic. By this measurement, San Francisco Bay oil movements were the same as Valdez, Alaska which ranks third highest in the United States after New York and Houston/Galveston Harbors.

Due to the shallow depths of portions of the Bay near marine terminals along the Contra Costa and Solano County shorelines, a number of large oil tankers lighter oil to smaller ships. Lightering is the process of unloading oil from a larger ship into smaller vessels in order to reduce the draft of the larger vessel. The tanker can then proceed to the marine terminal and continue unloading the balance of its cargo. Lightering primarily takes place at Anchorage 9, just south of the Oakland-Bay Bridge. Lightering operations take place, primarily by SeaRiver Maritime vessels, at Anchorage 9.

History and Types of All Accidents and Near Accidents

Accidents. The Coast Guard compiles reports of marine accidents or reportable casualties of commercial, military, and recreational vessels. A “reportable casualty” is defined in Title 46, Part 4, Code of Federal Regulations as grounding, loss of primary steering or propulsion or associated control system, by which the seaworthiness of a vessel is adversely affected or fitness of service, loss of life, injury beyond first aid, and damages over $25,000.

Near-Accidents. The Vessel Traffic Service (VTS), managed by the U. S. Coast Guard, summarizes near-accidents or close calls reported within the area covered by VTS. Possible near-accidents may not be reported outside VTS boundaries as well as accident occurrences within the VTS area. Incident reports are designed to include near-collisions, vessels impeding progress of other vessels, and violations of the rules of the road.

VTS personnel emphasize that categorizing an incident as a near-miss is a subjective determination based upon available information. (See Appendices for the current VTS Incident Report Summary).

Analysis and Actions Taken to Alleviate Re-Occurrences

Major bridges span Bay ship channels, connecting various populated areas of the Bay. The bridges are important traffic connectors in which large vessels must carefully navigate under pilings.

With the exception of the Golden Gate Bridge, vessels have struck all major Bay bridges within the past fifteen years. The most serious recent accident relative to a potential major oil spill occurred in 1988 when a 57,692 ton oil tanker hit the Carquinez Bridge, creating a 200-foot-long split in the ship's hull, exposing several oil tank compartments. However, because the tanker emptied its load of crude oil at a refinery along the Carquinez Strait a few hours earlier, a major oil spill did not occur. A representative of CalTrans stated that a radar beacon (racon) device was installed on the Carquinez Bridge after this accident occurred.

Previously, in 1971, two tankers collided in the main ship channel west of the Golden Gate Bridge, resulting in an oil spill. As a direct result of this accident, the Vessel Traffic Service (VTS) was established for the Bay. Up-to-date information on ship movements, weather and aids to navigation, etc. are reported; a traffic separation scheme was established. The VTS system is more fully described in a separate chapter.

The U. S. Coast Guard Marine Safety Office for the San Francisco Bay commented as follows on corrective actions taken by the Coast Guard:

> "All marine casualties occurring in the subject area meeting those criteria set forth in Title 46, Code of Federal Regulations, Part 4 are assigned to an investigation by Investigating Officers located in the Investigations Department at the U. S. Coast Guard Marine Safety Office, San Francisco Bay, located in Alameda, CA. These investigations are conducted to obtain information surrounding the root cause of the casualty so that corrective action can be taken and subsequent casualties of the same nature can be avoided. In accordance with 96 CFR Part 5, investigations are also conducted to ascertain whether personnel misconduct, negligence or drug/alcohol use was a factor in the casualty. In such instances, a personnel investigation would be conducted. Procedures such as these are administrative in nature and affect a person's Merchant Mariner's license or Merchant Mariner's Document.
>
> Civil penalty procedures could be warranted in a situation where a law or regulation has been violated. Civil penalty procedures are the only actions appropriate against the following: foreign flag vessel; personnel aboard foreign flagged vessels licensed under the authority of another nation; federally licensed pilots operating aboard a foreign flagged vessel while acting under the authority of a State Pilot's license; and unlicensed U. S. citizens. If a violation were criminal in nature, such action would be reported to and pursued by the U. S. Attorney's Office."

In addition, The Coast Guard has taken the following actions to alleviate re-occurrences of vessel accidents and near-accidents.

1) The forwarding of information to the *Coast Pilot* on unique tidal and non-tidal currents and supporting the establishment of PORTS to ensure that the mariner is properly informed of updated information;

2) The planned revision of the Tidal Current Tables once accurate information is obtained; and

3) Ongoing dialog with the San Francisco Bar Pilot Association on subjects such as Rule 9 violations and congestion points.

Recommendation

VII.1. Coast Guard/VTS Reporting System for Accidents and Violations of the Navigational Rules of the Road. 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. A report is 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.

STATUS. In 1992, the Harbor Safety Committee recommended that the Coast Guard and VTS devise a more consistent system of reporting accidents and near-accidents, standardized with other areas and analyze the statistics on an annual basis with recommendations for improvements. This recommendation has been essentially accomplished in San Francisco Bay.

As part of this effort, The Harbor safety Committee worked for adoption of a statewide definition of "near-miss." The following definition was adopted by the five California Harbor Safety Committees:

> "A reportable "Near-Miss Situation" is an incident in which a pilot, master, or other person in charge of navigating a vessel, successfully takes action of a non-routine nature to avoid: a collision with another vessel, structure, or aid to navigation, the grounding of a vessel, or damage to the environment."

The Committee also participated in establishing a system for voluntary reports of "near-miss" situations for the Coast Guard in order to prevent vessel accidents. A voluntary reporting form was adopted and included in the Vessel Traffic Service, San Francisco, June 1995 User's Manual. In addition, the Captain of the Port included the report form in the Marine Safety Office newsletter and the San Francisco Bar Pilots Association made the report form available to its members. However, due to the Freedom of Information Act (FOIA), the Coast Guard determined that anonymity could not be provided to persons making reports. Subsequently, in 1996, no written reports of "near-misses" were received by the Coast Guard Marine Safety Office or by VTS.

The three (3) near-misses reported in 1997 are a substantial reduction from nineteen (19) reported in 1996. Unfortunately, the MSO was unable to obtain enough information to process a civil penalty case on any of these incidents. Several civil penalty cases from near-misses in 1996 were closed with payment made by the offending party during 1997. The education program on Rule 9 of the Rules of the Road seems to be working. The MSO will continue its educational efforts.

Progress has been slow in standardizing marine accident reports with other areas because of the problems of guaranteeing anonymity for someone making a voluntary report and protecting against legal liability or penalties. The issue of how to establish a system for voluntary reports of near-misses continues to be explored elsewhere, both on the West Coast through the SMART Forum in Washington State, and nationally by the Coast Guard.

VIII. COMMUNICATION

Navigational Bridge Management.

Consideration of harbor safety should include the transit of the vessel from the sea buoy to the anchorage or dock. In such a situation involving the services of a pilot, the assumptions are: Captains have the best knowledge of their vessel characteristics, and Pilots are hired for having the best knowledge on local conditions.

To safely navigate when underway requires the integration of such skills with other members of the bridge watch. Teamwork is therefore necessary in order to best utilize the respective skills and equipment. This is all the more important to avoid one-person errors and impact the trend in statistics which confirm that a high percentage of casualties occur in restricted or pilotage waters.

Important elements in bridge management which should be considered are:

1) Preplanning of the transit by the bridge team using all available reference sources.

2) Information exchange with the pilot. This would include transit plan and pertinent details of vessel characteristics and equipment, especially any mechanical limitations.

3) Monitoring the vessel position and actions of the pilot to ensure compliance with the passage plan.

4) Recording relevant and important information

5) Communications within the bridge team as well as externally, consistent with protocols.

For more detailed information, reference should be made to the American Petroleum Institute publication titled *"Guidelines for Developing Bridge Management Teams"* and International Chamber of Shipping, *"Bridge Procedures Guide."*

Radio Communications

Existing communication systems for the maritime community in the San Francisco Bay Area are almost exclusively on marine VHF (very high frequency) radio. The level of usage is variable with periodic time spans of saturation as recreational boaters and fishermen utilize the frequencies. Additional communication modes include telex and cable to agents/pilots; and as the VHF frequencies become more congested, the increasing use of cellular telephones.

A "Guide to Recreational Vessel Marine Radio Communications for San Francisco Bay", including important marine radio channels and a removable sticker with procedures for emergency radio calls is available from the Marine Exchange. For reprints, contact the San Francisco Marine Exchange at: (415) 441-7988; or visit the Marine Exchange Website at: www.sfmx.org.

Current Usage

CHANNEL	USE
SAN FRANCISCO BAY COMMON FREQUENCY USAGE	
06	Intership safety. Also often used for non-distress traffic between USCG and other vessels.
10	San Francisco Bar Pilots Pilot Boats Agents San Francisco Marine Exchange
12	Vessel Traffic Service San Francisco offshore traffic. Used between outer limit of Offshore Precautionary Area and VTS outer limit (38 nautical mile radius from Mt. Tamalpais)
13	Bridge to bridge navigation
14	Vessel Traffic Service San Francisco in-shore traffic. Use from outer limit of Offshore Precautionary Area, throughout San Francisco Bay, up to Stockton and Sacramento.
16	Hailing/distress/safety
21A	U.S. Coast Guard reserved working frequency between USCG units only
22	Notice to Mariners
23A	U.S. Coast Guard reserved working frequency for communications between USCG units and other vessels
7A, 11, 18A, 19A	Common tug working frequencies
79A, 80A, 88A	Commonly used by fishing vessels
7A, 8, 9, 11, 18A, 19A	Port Operations — Commercial intership and ship to shore working channels. Commercial vessel business and operational needs.
9, 68, 69, 71, 72, 78A	Port Operations — Non-commercial; supplies repairs, berthing, yacht harbors/marinas.

TUG COMPANY CHANNELS	
7A	Chevron Shipping
9	Westar Marine Services
10	Crowley Maritime SeaRiver Maritime Foss Maritime
18A	American Navigation Bay & Delta Towing Brusco Tug & Barge Oscar Niemeth Towing Seaway Towing Company Starlight Marine
MARINE OPERATORS	
26, 84, 87	San Francisco
27, 28, 86	Sacramento, Stockton, Delta
VESSEL TRAFFIC SERVICE RADIO COVERAGE	
Present coverage of the Bay Area by VHF–FM radio is considered adequate for communicating with VTS.	

2. Existing Equipment

A. San Francisco Vessel Traffic Service. The VTS communications suite consists of four identical systems located strategically throughout the area to ensure complete VHF radio coverage of its entire AOR.

B. **San Francisco Bar Pilots.** The San Francisco Bar Pilots' headquarters is located at the East end of Pier 9, San Francisco. The antenna for the primary system is located on Mount Tamalpais.

All pilot boats have GPS. The **Pittsburg** has a GPS receiver. The **California**, **San Francisco** have all Furuno electronic equipment, which includes the electronic chart system, radars, DGPS, and fathometer. The Drake and **Golden Gate** have LEICA GPS Navigators.

The **California**, **San Francisco**, **Drake** and **Golden Gate** have PC-based electronic chart systems with Nobeltek software and raster charts.

The **California**, **San Francisco**, and **Golden Gate** have AIS equipment (auto identification system).

C. **San Francisco Marine Exchange**. The Marine Exchange is located at Fort Mason Center, San Francisco. The Exchange shares a Mount Tamalpais antenna with the Bar Pilots.

1) A Motorola 50-watt transceiver on Channel 10.

2) Standard transceiver with a local antenna monitoring Channels 13, 14, & 18A.

Recommendation

VIII.1. VTS Channel. 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.

STATUS. The VTS operating channel was changed to Channel 14 VHF-FM on August 15, 1994. The decision to change to Channel 14 was based on recommendations made by the Quality Action Team (QAT), consisting of persons from various maritime organizations within the San Francisco Bay Area. The change has significantly reduced the amount of radio traffic on Channel 13. No further action is necessary.

The San Francisco Marine Exchange, a non-profit agency which serves as the Clearinghouse for tug escorting of regulated tankers and barges, purchased and installed a back-up generator for its communications system, as recommended by the Harbor Safety Committee. Public and private funding sources to maintain and expand the communications system, including back-up power, will be further explored by the Marine Exchange. No further action is necessary.

IX. BRIDGES

The San Francisco Bay Area is crossed by a number of bridges for automotive and rail traffic. The vast majority of shipping traffic works in areas covered by suspension or fixed bridges with substantial vertical clearance.

Geographic Boundaries. The boundaries of the area in this chapter are set in the West by the COLREGS Demarcation Line (Between Pt. Bonita and Mile Rocks), and in the East to include the Rio Vista Highway Bridge in the Sacramento River and the Antioch Highway Bridge in the San Joaquin River. The Eastern boundary exceeds the boundary set by SB 2040, ch. 7.4, section 8670.3(h), which defines the marine waters and which sets the boundary as a line running North and South through a point where the Contra Costa, Sacramento, and Solano Counties meet.

The decision to extend the boundary further to the East was made in order to include in this project the Antioch and Rio Vista Bridges, as both bridges are encountered by ocean going vessel traffic bound for the Ports of Stockton and Sacramento.

Schedule of Bridge Openings

Bay Area bridges that open or swing do so on a fixed schedule. Swinging bridges are normally used for railroads and are maintained in the open position. They are only closed for the passing of a train, then return to the open position. The bascule (a counter-weighted drawbridge) for vertical lift bridges are tended and may be opened by contacting the bridge keeper on VHF radio.

Oceangoing vessels may transit under two vertical lift bridges, the Benicia-Martinez RR Bridge and the Rio Vista Highway Bridge. Both bridges are manned 24 hours a day and open for vessel traffic upon request. Approximately 30 minutes notice is required and the bridges may be contacted by VHF or telephone.

BRIDGE	VHF CHANNELS	PHONE NUMBER
Benicia-Martinez RR Bridge	13	(510) 228-5943
Rio Vista	9, 13, 16	(707) 374-2134

Adequacy of Ship to Bridge Communications

Ship to bridge communications takes place via VHF radio on designated channels. These include channels 9, 13, 16, 17, and 65A. Communications are considered to be adequate by the local pilots.

Physical Characteristics of Bridges

All bridges over navigable waterways are equipped with lights marking the center of the bridge, and in the case of drawbridges, the closed or fully open positions. Most are equipped with sound producing devices which are used during periods of reduced visibility. The Bay/Delta area now has twelve racons on bridges, which represents the majority of racons placed on bridges in the United States. The racons are justified because the harbor has the highest number of foggy days in the nation where visibility is less than one-half mile together with a high volume of vessel traffic transiting under the bridges.

A racon is a radar sensor that sends out a radar emission that shows up as a distinctive mark on ship's radarscope. Racons are on the following bridges:

Benicia–Martinez (1)
SF–Oakland Bay Bridge (3)
Richmond–San Rafael Bridge (2)
San Mateo–Hayward Bridge (1)
Antioch Bridge (1)
Rio Vista Bridge (1)
Golden Gate Bridge (1)

To complete the system of racons on Bay/Delta bridges, the Rio Vista Bridge Racon was installed and tested on February 24, 1998 and is now in service. The Racon displays the Morse character "T". **Bridge Clearances**

(See Appendices for most recent list of bridge clearances.)

Benicia-Martinez Railroad Drawbridge

To improve navigational safety for all vessels sailing through the relatively narrow opening of the Drawbridge at Benicia, the Coast Guard has completed a number of initiatives:

1. Established a Regulated Navigational Area (RNA) at the bridge which prohibits deep draft vessel transits when visibility is less than 1000 yards. The Coast Guard is proposing to revise the RNA. The revision would change the name of the bridge that is the focus of the RNA to reflect a change in corporate name, add a third visibility checkpoint, and clarify the procedures for downbound vessels which are moored between the Railroad Drawbridge and New York Point that intend to transit the RNA once underway.

2. Installed white lights on the main channel piers to better identify the primary navigation channel. The white pier lights recommended for installation on the main channel piers have provided better visibility in foggy conditions and have been made permanent.

3. Asked UPRR to change the working frequency of the bridge radiotelephone to VHF-FM Channel 13, to allow vessels and bridge operators to communicate directly instead of using Vessel Traffic Service Channel 14.

4. Investigated bridge malfunctions and created natural working group to find solutions to process and equipment problems.

5. Had CalTrans make modifications to the racon on the adjacent highway bridge which has improved the signal to downbound vessels.

6. Evaluated the obstructive character of the bridge under the Truman-Hobbs Act of 1940. Long term process to determine if increasing bridge clearances will provide benefits to navigation greater than the costs of modifying the bridge. The outcome of such a study would determine if the bridge should be altered.

Most of the recommended bridge improvement items have been completed by Union Pacific Railroad (UPRR). UPRR has installed a new auxiliary power system including new generators and transformers, along with a new signal system. New enhancements include replacement of the bridge lift motors, installation of a computerized system to monitor train locations and track conditions and a computer system to track vessels upbound or downbound for the bridge.

To address the problems occurring with the operation of the UPRR Bridge, industry, the pilots and Coast Guard continue to interface with the bridge owners via the UPRR Bridge Working Group. The working group meets semi-annually to address problems with the bridge and to develop solutions. The working group is coordinated by the Bridge Section of the Coast Guard Eleventh District and is regularly attended by representatives from both rail and marine industry, as well as Coast Guard MSO and VTS. Under the working group's direction Union Pacific has developed a formal training program for bridge operators which includes ship rides for familiarization and better understanding of potential or near-miss situations. The working group created a mishap matrix to capture incidents involving the bridge. Input to the matrix come from both the Coast Guard and Union Pacific Railroad and is used as a problem solving tool and historical reference.

Recommendations

IX.1. Energy-Absorbing Fenders for Bridges. OSPR should request Caltrans and other bridge operators such as the Golden Gate Bridge to install energy-absorbing fendering, instead of wooden or plastic fendering, on all area bridges when replacing damaged fenders and for all new construction.

> **STATUS.** The seismic retrofit of the Richmond–San Rafael Bridge will not include energy-absorbing fenders (like the hydraulic fenders at the Benicia–Martinez Highway Bridge), however the existing fender will be replaced ("in kind") with plastic laminate material which has improved energy absorption. CalTrans will install a similar fendering system on the new Benicia Highway Bridge and on other bridges undergoing seismic modifications. OSPR continues to encourage CalTrans and other bridge owners in the Bay Area to consider energy-absorbing fenders where possible.

IX.2. Bridge Clearance Gauges. Bridge clearance gauges should be installed where needed, particularly drawbridges.

STATUS. Bridge level gauges are already in place at area bridges where needed. It was noted, however, that the bridge level gauges, which are simply numbered wooden boards affixed to a bridge and indicating the clearance between the water and the raised portion of the bridge, are of little use to larger vessels, as the gauges do not become visible before the vessels are committed to making their transit. No further action is necessary.

IX.3. Water Level Gauges. Water level gauges should be installed at approach points to bridges.

STATUS. The PORTS system, currently being installed by NOAA, includes a system of electronic water level gauges located at area bridges, which will indicate the level of the tide at the measured points on a real time basis. No further action is necessary.

X. SMALL VESSELS

Background

Within the Bay, many recreational boats, windsurfers and commercial fishermen transit navigational shipping lanes and some approaches to port and marine terminal facilities. The central part of the Bay, with the heaviest concentration of population in close proximity to the shoreline, boasts the largest number of small boat marinas along the San Francisco, Alameda, Contra Costa, and Marin County shorelines. Two-thirds of approximately 20,000 Bay Area marina berths are located in the central Bay. This number does not include facilities on the Sacramento and San Joaquin Rivers. While only a percentage of boat owners are on the Bay at a given time, on a sunny weekend up to 1,000 boats may participate in races and various events on the Bay.

The last Sunday in April (Opening Day on the Bay), Memorial Day, and Labor Day are times of extreme congestion by small vessels. There are many occasions where six or eight races may be held in the same venue, vessels starting at five minute intervals. This may lead to more racing congestion than a single large popular regatta. Race instructions now carry a warning regarding interfering with large vessels.

Personal watercraft sports, more commonly referred to as jet skiing, is also popular in the Bay Area. Skiers can easily access the water from public launches, marinas, and private docks. Personal watercraft can attain speeds up to 40 knots per hour and are not dependent upon calm waters or wind. Because of this versatility, operators frequent main ship channels, narrow estuaries, and the open Bay in addition to shallower waters. It is estimated that roughly 5,000 personal watercraft are used in the Bay (Kawasaki Jet Ski representative, 1992).

In addition, boardsailing has become a popular Bay Area sport. Primary locations for boardsailing are Crissy Field, the Larkspur Ferry Terminal, Coyote Point in San Mateo County, the Glen Cove Marina in Benicia, and Rio Vista. From Crissy Field, located along the northern shoreline of the San Francisco Peninsula just east of the Golden Gate Bridge, strong winds propel boardsailors across the main shipping lane where inbound and outbound tankers, container ships and other vessels transit under the Golden Gate Bridge.

Coast Guard representatives and ship operators note that small craft are difficult to visually spot during periods of restricted visibility. Because of the size of the vessel, radar images are poor which may create a possible hazard to navigation.

The Bay Area commercial fishing fleet is made up of approximately 1,000 boats (Pacific Coast Federation of Fishermen's Associations, 1992). However, of this number, about 150 to 200 boats are used full-time for commercial fishing, principally berthed in San Francisco, Sausalito and Oakland. Many of the licensed commercial fishermen are essentially part-time operators, fishing on weekends and holidays by trailering small boats to launch ramps. In the Bay the only commercial fish caught are herring and anchovies with herring the most important in-Bay fishery. During the December to March herring season, additional boats from other areas enter the Bay to lay their nets. The State Department of Fish and Game controls the number of boats fishing in the Bay during the herring season and regulates the manner of fishing. The herring fishery is highly competitive because during a short period of time large profits can be realized.

Vessel Traffic Incidents

- **Recreational Boats.** Thousand of recreational boats are concentrated near the major inbound and outbound Bay shipping lanes. While many sailboats and motorboats are on the Bay, particularly on weekends, few near-misses or accidents are reported to the Coast Guard and VTS. A number of reported and unreported 'near-misses' occur which might be prevented by small boats properly yielding the right-of-way to large vessels that cannot change course.

- **Boardsailors.** No accidents or near-accidents involving boardsailors and vessels have been reported to the Coast Guard or VTS during the past years. However, many boardsailors cross in front of tankers and container ships off Crissy Field which is close to the Golden Gate Bridge. Competitive races are sponsored at this location during the year.

- **Personal Water Craft.** While a number of injury accidents involving personal water craft (jet skis) have occurred during the past three years, none involved a collision with a vessel and no fatalities have occurred in the Bay Area (California Department of Boating and Waterways, 1992). One fatality occurred in the Delta in 1991 at Suicide Beach.

- **Fishermen.** In 1994 a fatal accident occurred when a fishing vessel collided with an inbound container ship just west of the Golden Gate Bridge. The fishing vessel sank and two lives were lost. Various individuals have recounted possibly dangerous situations involving herring fishermen. A herring fisherman laid a large net around the oil skimmer boat at the Chevron Long Wharf; a herring net impeded a container ship docking in the Oakland harbor; a herring net delayed a pilot boat leaving to meet an inbound vessel; herring nets have been laid around fire boats at the Ports of Oakland and San Francisco. The nets may pose an impediment to emergency response vessels such as fireboats and oil skimmers. Nets near terminal docking areas may possibly cause unsafe ship maneuvers.

Public Education

Currently, the following boater education programs are available to the boating public in the nine Bay area counties.

	Subjects
U.S. Power Squadrons	Boating Safety Rules of the Road, Basic Rescue (A home video course is available for purchase)
U.S. Coast Guard Auxiliary	Boating Safety Rules of the Road, Basic Rescue
Department of Boating and Waterways	Water Safety/Grades K–12, General

In addition, the U.S. Coast Guard operates a Boating Safety Hotline that dispenses information and reference to local classes.

After reviewing information on licensing of small recreational boat operators, it was agreed that, at this time, emphasis on boater education and enforcement on the waterways would be a more effective approach to deal with unsafe operators rather than instituting the licensing of small boat operators.

Recommendations

X.1. Herring Fishermen. 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.

> **STATUS.** OSPR supports continued coordination among federal, state, municipal, and fishing organizations prior to each herring fishing season. The VTS has provided instructional brochures and flyers to educate herring fishermen about local navigation regulations and policies. No further action is necessary.

X.2. Observation of Sailboat Races. 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 form the competitors' level.

> **STATUS.** In the past the St. Francis Yacht Club invited representatives of the Harbor Safety Committee to observe a sailboat race, but no one attended. No further action is necessary.

X.3. Observation of Boats from a Tanker. Race officials and other interested parties should be invited aboard a large tanker while underway to get the pilots' perspective of racing vessels, if practicable.

> **STATUS.** A tanker operator (SeaRiver Maritime) is willing to permit representatives of the small boat community to observe navigation on a tanker bridge on in-Bay transit. No further action is necessary.

X.4. Annual Racing Schedules. 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.

> **STATUS.** Racing Schedules have been furnished to the Marine Exchange for distribution and will be routinely furnished for future events. No further action is necessary.

X.5. Optional Race Course Information. 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.

> **STATUS.** The Yacht Racing Association has provided and will provide future information to the Marine Exchange regarding optional courses and rounding marks. No further action is necessary.

X.6. Rule 9 Infraction. 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.

> **STATUS.** The Coast Guard reports the following actions were taken. The Coast Guard Auxiliary is prohibited from taking any law enforcement action; it is an educational organization. The Auxiliary conducted 188 Safe Boating Courses in Northern California in 1992 with 1,278 graduates. The Auxiliary changed its Boating Safety Course curriculum to specifically include information on Rule 9, its meaning and the constraints to navigation for larger vessels in the confined shipping channels of the Bay.
>
> With all document renewals the Coast Guard included flyers on Boating Safety Courses and information on obtaining safety pamphlets. The Coast Guard routinely includes information on Rule 9 infractions to applicants for marine parade and regatta permits. Prior to the commencement of a sailboat race, the committee boat must check in with VTS. No further action is necessary.

X.7. Educational Pamphlets. 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.

STATUS. The California Department of Motor Vehicles distributes educational pamphlets in boat registration renewal notices. OSPR has an implementation plan to work with marinas to get their assistance in boater education, such as enclosing educational pamphlets in marine mailings, and requesting marinas to encourage completion of safe boater courses.

No further action is necessary.

X.8. Report Rule 9 Violations. 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.

STATUS. The Eleventh Coast Guard District Commander has encouraged the San Francisco Bar Pilots to report Rule 9 infractions. It is acknowledged there is some difficulty in positively identifying the boat numbers from the bridge of a large vessel.

The Coast Guard Vessel Traffic Service (VTS) includes near miss reporting in the VTS Users' Guide for San Francisco Bay. In 1997, the number of reported Rule 9 incident involving ships and small boats (recreational and fishing vessels) decreased by more than half over the previous year. The reduction in the number of near misses is presumed due to increased awareness of Rule 9 by small boat operators. (See the Appendixes for the list of near miss incidents reports.)

The following is a breakdown of the types of commercial vessels that experienced near misses with small boats in 1997:

3 — Tankers

2 — Container ships

1 — Bulk ship

1 — Tug with tow

1 — Tug without tow

Five incidents occurred involving fishing vessels and three with recreational boats. The number of incidents involving fishing boats increased from 4 in 1996 to 5 in 1997 while recreational boat incidents decreased from 14 to 3. The need for continuing education of small operators is addressed in Recommendation X.12. listed below.

X.9. Publicize Rule 9 Infractions. 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.

> **STATUS.** In 1994, the Office of Oil Spill Prevention and Response (OSPR) initiated an outreach program to coordinate the distribution of boating and waterway safety information to the public. This information is now being distributed by the Department of Motor Vehicles. The educational effort should include the Pacific Inter-Club Yacht Association wording to address Rule 9 infractions in all club race instructions. The Yacht Racing Association should also add a Rule 9 requirement to all their race instructions that the act of interference will result in disqualification.
>
> The Coast Guard has been including information on Rule 9 violation cases in the Marine Safety Office newsletter. This newsletter receives wide distribution among the various groups navigating on the Bay including small boat operators.

X.10. Coast Guard Auxiliary Education Efforts. Encourage the ongoing efforts of the local U.S. Coast Guard Auxiliary and Power Squadron organizations in their boating education and safety effort.

> **STATUS.** A tanker operator (SeaRiver Maritime) is willing to permit members of the Coast Guard Auxiliary to observe navigation of a tanker, from the ship's perspective, during an in-Bay transit. This might help to educate both safe boating course instructors and their students on the hazards of reckless operation of small boats in commercial traffic areas. No further action is necessary.

X.11. Boardsailors. 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.

> **STATUS.** Several years ago a representative of the Harbor Safety Committee met with representatives of the San Francisco Boardsailing Association and the San Francisco Bar Pilots Association to aid in preparing a comprehensive guide to boardsailing in the Bay. A section was included on the hazards of sailing in shipping lanes near large vessels and tugs with barges.
>
> OSPR has an implementation plan to work with the National Park Service to improve the sign at Crissy Field to include more information about the dangers of board sailing in the main shipping lanes by the Golden Gate Bridge.

X.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 boardsailors 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.

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

STATUS. OSPR has drafted an implementation plan to address the recommendations to enhance recreational boater education and to encourage greater enforcement of navigational rules and laws on the waterways.

XI. VESSEL TRAFFIC SERVICE

The Coast Guard established the VTS system in 1972 in San Francisco Bay following a serious collision between two tank vessels that resulted in great environmental damage to the Bay. The Coast Guard continues to operate the VTS system and monitors nearly 400 vessel movements per day. The region is considered a difficult navigation area because of its high-traffic density, frequent episodes of fog, and challenging navigational hazards. In 1996 Congress considered reducing the current level of funding for VTS-San Francisco. In response to Congress' initiatives, the Harbor Safety Committee voted to support continued federal funding to maintain VTS-San Francisco at its current level in order to ensure navigational safety in the Bay.

The US Coast Guard's VTS for the San Francisco area has five components: (1) radar and visual surveillance, (2) VHF communications network, (3) a position reporting system, (4) traffic routing within the Bay, (5) a 24 hour center that is staffed with specially trained vessel traffic control specialists.

The geographic area served by VTS- SF includes San Francisco Bay, its seaward approaches, and its tributaries as far as Stockton and Sacramento.

1. VTS Position Reporting Requirements

Vessel position reporting requirements vary according to the location within the VTS Service Area; offshore, in the Bay Area within VTS radar-surveillance capability, and in the Bay Area beyond the VTS radar coverage.

Offshore. Vessels are asked to make radio reports when entering or exiting the offshore VTS reporting area, which extends approximately 30 miles from the Golden Gate Bridge. This boundary is outside VTS's offshore Point Bonita radar surveillance range except in the south. Inbound vessels are asked to report 15 minutes prior to crossing the offshore boundary, upon entering the respective Traffic Separation Scheme (TSS), and upon entering the precautionary area. Outbound vessels are asked to report once at the San Francisco Sea Buoy, again at the TSS entrance buoy, at the terminus of the TSS, and finally at the outer boundary of the VTS area. Radio reports include the name and type of vessel, route, course, speed, position, and estimated times of arrival to various geographic locations. The Vessel Traffic Center (VTC) broadcasts a traffic report every 30 minutes: at minute 15 and 45 of each hour.

Within the Bay. VTS radar surveillance extends from the San Mateo Bridge to the Carquinez Bridge, covering most of South San Francisco Bay, all of the Central Bay, and all of San Pablo Bay. Vessels report upon getting underway, docking, mooring, or anchoring in or when departing from this area. Position reports are also made when passing under most bridges, when pilots change, when emergencies arise, and when deviating from standard procedures. Ferries operating on a scheduled route report only upon departure.

2. Traffic Routing within San Francisco Bay

On May 3, 1995, the Coast Guard established seven Regulated Navigation Areas (RNAs) to reduce vessel congestion where maneuvering room is limited. These RNAs apply to the waters of the Central Bay, Oakland Harbor, San Pablo Bay, and the Union Pacific Railroad Bridge. There are four VHF radio/communications sites located throughout the Bay which give VTS full radio coverage. VTS operates on channel 14 VHF-FM for inshore traffic and channel 12 for offshore traffic, and monitors channel 13 throughout the VTS area.

Staffing. There are approximately 30 Coast Guard and civilian personnel attached to the VTS. The VTC is most frequently staffed with four watchstanders – a supervisor and three controllers – rotating on 8-hour shifts. Optimum manning is five watchstanders – a supervisor and 4 controllers, however, staffing levels rarely support this.

3. VTS Training Program Overview.

The VTS Training Program is structured as follows:

Vessel Traffic Control Specialist Qualification Training

A. TRAINING PHASE	1. HOURS
VTS Indoctrination and Fundamentals • Mission and philosophy of operation • Federal and local rules and regulations	80
• Delegation of authority • In-depth VTS area geography	80
Using the Vessel Traffic Service System (extensive off-the-air practice) • Surveillance (traffic management) computer system operation • Traffic Management concepts and procedures • Communications procedures	80
On-the-job training (live, on-the-air) • One-on-one coached proficiency training in the VTS operations center	300
On-the-job training (live,on-the-air) • Closely supervised but un-coached performance assessment	48
• Oral Examination Board chaired by the Commanding Officer	

Supervisory Vessel Traffic Control Specialist (SVTCS) Qualification Training

Only personnel who demonstrate superior performance and leadership as Vessel Traffic Control Specialists are considered for supervisory training.

SVTCS candidates complete a minimum of 40 hours of supervisory on-the-job training.

They are qualified upon completion of an oral examination.

Qualification renewal (maintenance of qualification)

The qualification renewal process can consist of the following:

- Written rules and regulations exam
- Watch supervisor recommendation
- Completion of annual vessel ride and visit requirements
- Re-certification by the Commanding Officer

4. **Outreach and Partnership.** The San Francisco Bar Pilots and the US Coast Guard Vessel Traffic Service San Francisco, as well as other members of the maritime community, continue to share professional information in order to foster a teamwork approach to the issue of navigation safety within the San Francisco Bay Area. VTS participates in the following outreach and partnership programs.

VTS-Pilots Issue Committee (VPIC). Founded in 1995, the VPIC work group, comprised of VTS's CO, Operations Officer, Operations Administrator, and the Training Coordinator along with three members of the San Francisco Bar Pilots, meet approximately every month to discuss how VTS and the Bar Pilots can better serve each other. Both agencies might bring in scenarios or review recorded tapes, then discuss the transactions from their respective points of view. For example, VTS may explain why a particular deviation request from RNA regulations was not granted. With the VPIC interaction, VTS can explain the response from a VTS point of view. On the other hand, the pilot members may explain why the requested deviation seemed safer from the pilot's point of view.

Examples of items that came out of VPIC meetings include: the automation of information exchange between VTS and the Pilots; developing communication protocol to resolve communication issues around marine construction projects; refining internal reporting procedures in order to provide mariners with more accurate reports of ongoing marine construction in the Bay area.

San Francisco Vessel Mutual Assistance Plan (SF-VMAP). SF V-MAP is composed of member vessels, the Coast Guard, and passenger vessel operators who came together to develop an emergency response plan that would ensure a sufficient level of safety exists on small passenger vessels and enhance local capabilities to manage a catastrophic, waterborne Search and Rescue incident. VTS was active in the creation of this plan and continues to participate in annual drills and meetings.

Union Pacific Railroad Drawbridge Natural Working Group. This group is composed of members of the maritime community, the pilots organization, various offices within the Coast Guard, the Union Pacific Railroad, and major train lines to address the ability of the bridge to consistently provide a prompt response to lift requests or provide timely notification to an approaching vessel if mechanical problems or train movements would cause a delay in the bridge's response.

Outreach. VTS personnel spend hundreds of hours with people from various segments of the San Francisco Bay maritime community to learn about mariners' concerns and to educate VTS participants about how they can get the most out of VTS. VTS personnel are active members on the Underwater Rocks Work Group, AIS Joint Planning Partnership, and the Prevention Through People Work Group. Outreach efforts have also included many non-traditional stakeholders in the Bay area, such as California Department of Transportation bridge engineers responsible for overseeing the various seismic retrofit projects in progress throughout the Bay.

Fishing Vessel Safety Group. VTS is a participant in the FVSG. A VTS representative meets every other month with group, which comprises representatives of other Coast Guard units, local fishermen groups, and state agencies.

Marine Events. San Francisco Bay has more marine events than any other port or city in the United States. VTS has an outreach program to the boating public. VTS works closely with Group San Francisco during the permit process and yachting organizations to prevent recreational vessels from impeding commercial traffic. VTS hosts annual Marine Event Workshops aimed at educating even coordinators about commercial maritime traffic, rule 9, and VTS operations.

VTS Shipride Program. All VTS personnel are required to conduct approximately 6 ship rides and shore-side visits each year. This, by far, is the best method of direct, person to person interface and the sharing of suggestions. The requirements cover almost all areas of the maritime community: piloted ships, tugs, ferryboats, and shore facilities.

<u>Recommendations</u>

XI.2. Changes in VTS Operations and Requirements

a. Upgrade Equipment. Upgrade the current equipment used by VTS-SF to include state of the art technology (US Coast Guard, Port Needs Study: Vessel Traffic Services Benefits, Volume 1: Study Report and Volume II, Appendices, Part 2)

Status. The initial installation of upgraded equipment was completed in 1997. In December of 2000, VTS completed a scheduled upgrade which included a new version of software used to operate the CGVTS system, installation of state of the art hardware, and a complete renovation of VTS' communication system. The communication system upgrade involved replacing radios at each of the VTS' four high sites, converting from an analog to a digital microwave system, and installing a new radio control system within the VTC.

XII. TUG ESCORT / ASSIST FOR TANK VESSELS

Background

In 1990, Senate Bill 2040 (the Oil Spill Prevention and Response Act) mandated that tug escorting was beneficial for tanker operations and directed expeditious development of escorting regulations on San Francisco Bay. The requirement is based on the legislative finding that there is a navigational safety advantage of tug escorts. Tug escorts can improve tanker safety in at least two ways. Tug escorts can serve as emergency maneuvering aids in the event of loss of steering or propulsion. A tug escort may also assist as an independent aid in the navigation of a tanker.

The Final Report of the States/British Columbia Oil Spill Task Force (1990) concluded that the risk of an oil spill could be reduced by 8% to 11% with the mandatory use of tug escorts. That report, endorsed by the State of California, suggested that the escorts be highly maneuverable, have speed complementary to the tanker with sufficient power to control tanker direction, and that the power and number of escort tugs should be proportionate to the deadweight tonnage of the tanker.

The Harbor Safety Committee (HSC) established a Tug Escort Subcommittee, which created Interim Guidelines for tug escorting in San Francisco Bay. The Interim Guidelines recommended: minimum requirements for tug escort equipment and crews; a formula for matching tugs to tankers; establishing a central Clearing House to measure bollard pull and monitor and document compliance with the regulations; setting tug escort zones in the Bay; and various operational considerations. OSPR caused emergency regulations to be established in the winter of 1992 based on the Interim Guidelines.

In the spring of 1993, the HSC adopted a revised set of Permanent Guidelines to supersede the emergency regulations. The Permanent Tug Escort Guidelines differed from the Interim Guidelines in a number of significant respects. The Permanent Guidelines altered the formula for matching tugs to vessels by changing the bollard pull formula from ahead static bollard pull equal (or greater) than the dead weight tonnage of a regulated vessel to the astern static bollard pull in the same ratio. Additionally performance standards for stopping a tanker; equipment standards and inspection of tugs; positioning of regulated vessels; and training requirements for tug escort crews were established. During the State's administrative process, OSPR chose to reject the permanent guidelines on the basis of their lack of rationale and scientific basis for matching tugs to tankers.

The subcommittee began what turned out to be a two-year process of preparing a scientific study through use of a consultant and holding extensive public hearings on the results. Based on State funding concerns and time limitations, industry volunteered to engage a consultant in conjunction with an industry-based Technical Advisory Group and the Tug Escort Subcommittee acting as a policy board. Glosten Associates was hired to prepare a professional study focusing on the specific of tug escorting on San Francisco Bay. Additionally, the State funded a peer reviewer, Michael M. Bernitsas of the University of Michigan, to review the consultant's work and to mitigate concern regarding bias. Their reports were completed in the winter of 1994.

The Glosten Study had adopted a dual-failure standard, that is the simultaneous loss of both propulsion and steering, as the basis for measuring the force (tanker demands) required to recover from the tanker machinery failure and remain within the tactical area of performance. Further, the tactical area was based on the ninety-fifth percentile of success in stopping the tanker within the available reach and transfer. After review of the enabling scope of work and industry concerns regarding the likelihood of a dual failure and the attendant tanker demands, the dual standard was thought to be unreasonable. The subcommittee set up various working groups to review failure probability, waterway characteristics, commercial and navigational safety implications of demand standards and requested that Glosten calculate demands based on single failures.

These efforts resulted in a second Glosten Study and reports on failure probability and waterway specific characteristics. The subcommittee reviewed these reports and adopted a single failure standard for the development of matching criteria.

The process involved close involvement and participation by the interested public and OSPR. On August 10, 1995, the full Harbor Safety Committee reviewed and adopted the Tug Escort Subcommittee's guidelines on a vote of twelve to one. The Harbor Safety Committee promptly transmitted the new guidelines and recommendations to OSPR for implementation.

The Committee publicly reviewed the regulatory language proposed by OSPR. During the review of the regulations, several issues were identified as not being in compliance with the Committee's recommendations. The most critical issues related to the intended use of checklists to review and develop a transit-specific plan versus OSPR's new requirements that plans be filed with OSPR thirty days in advance. OSPR subsequently agreed to modify its proposed language to comply with the intent of the Committee's guidelines, which the Committee adopted in January 1996.

OSPR held a hearing on the proposed permanent tug escort regulations on March 19, 1996. Approximately 15 people testified at the hearing. Most supported the new regulations but a sizable group protested the use of a single-failure standard instead of a dual-failure standard. Many of the commenter also suggested minor modifications to the regulations, such as individualized, company-specific check lists and reducing pilot liability. Written comments were also received.

In addition to the public hearing process on regulations, OSPR is required by law to have regulations reviewed by the State Inter-Agency Oil Spill Prevention Committee, which reviewed and approved the regulations for implementation, and by the Technical Advisory Committee (TAC), which is purely advisory and has no approval or disapproval authority. The issue of dual- versus single-failure standard was again debated.

The new Tug Escort regulations became effective January 1, 1997. (See Appendices for current list of certified tug escorts, the current Clearing House Report on escorted vessel movements and Appendix F for Amended Tug Escort Regulations which became effective January 1, 1997.) In 2001-02 the Tug Escort Work Group completed a comprehensive study of the tug/tanker matching matrix and concluded the matrix remained valid and should not be modified. The Harbor Safety Committee concurred with this finding.

It should be noted that the 1997 Tug Escort regulations requires that the OSPR Administrator must:

> "review the matching criteria and other program elements within two years of the effective date of this subchapter. The program review will include a survey of the tanker-related incidents in U.S. waters to determine the types of failures that have occurred, an assessment of tug technology and any advances made in design and power, and the tug escort organizations. At the conclusion of the review, the Administrator will determine whether it is necessary to modify the tug/tanker matching criteria or any other provision of the program requirements."

This OSPR review must take place by January 1, 1999, to determine whether any changes to the tug/tanker matching formula should be made. In 2001-2002, the Tug Escort Work Group reviewed the tug/tanker matching matrix and found that it remains valid and does not need to be modified.

The Clearing House reports that industry has changed their procedures to comply with the new regulations and that there have been no significant problems in implementing the regulations. (See Chapter XVI Plan Enforcement.)

Recommendations

Technical Pilotage Committee. The Harbor Safety Plan calls for establishing a technical pilotage committee to review waterway-specific maneuvers.

> **STATUS.** This recommendation is pending, awaiting the call of the Chair of the Harbor Safety Committee.

XIII. PILOTAGE

Pilotage is an extremely important issue to Bay shipping because of complex local conditions consisting of narrow navigation channels, many bridges, swift tides and currents, variable weather patterns, and large numbers of ships and small vessels. For over one hundred fifty years, the state has regulated pilotage over the Golden Gate bar by creating the State Board of Pilot Commissioners in 1850 to regulate pilotage.

Federal Pilots. Federal pilots are licensed by the U.S. Coast Guard to handle American flag vessels under registry. Only a few federal pilots operate within the Bay.

Inland Pilots. An inland pilot is required to have both a state license and a federal license to pilot vessels solely inside of the Golden Gate. The state has not authorized any new inland pilots since 1985. One pilot continues to operate as an inland pilot. The State Board of Pilot Commissioners regulates inland pilots.

Pilots. This category of pilots is also referred to as Bar Pilots. A state license is required for a pilot to handle vessels entering the Bay and operating inside the Bay. A federal pilot's license is also required. The State Board of Pilot Commissioners regulates the number, licensing, training and disciplining of pilots for the Bays of San Francisco, San Pablo and Suisun.

Pilotage for the Ports of Stockton and Sacramento. The Ports of Stockton and Sacramento have separate pilotage authority from the Board of Pilot Commissioners. In practice, these ports use both inland and (bar) pilots licensed by the state.

Docking Pilots. Section 1179 of the Harbors and Navigation Code allows shipping companies who expressed their intent to the Board of Pilot Commissioners before July 1, 1983, to have their own employees used as pilots in lieu of (bar) pilots. In the Bay, one shipping company uses its own employee(s) as pilots for docking who are not subject to State Board of Pilot Commission regulations. The employee has a federal pilot's license.

Recommendations

XIII.1 Shipping Company Employees Who Serve as Pilots.

The California Harbor and Navigation Code, Section 1179 regarding use of shipping company employees for piloting vessels should be amended to read:

> "Notwithstanding any other provisions of this division, any shipping company which regularly employed its employees, or expressed its intent to the Board of Pilot Commissioners to use its employees for piloting vessels on the Bays of San Francisco, San Pablo and Suisun on or before July 1, 1983, may employ and use its employees in that manner in lieu of pilots provided under this Chapter so long as these employees shall 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."

Pilots within this category, known as docking pilots, are not presently required to have completed local trips within the Bays and are not subject to jurisdiction of the State Board of Commissioners. The OSPR Administrator should pursue making this change to the California Harbor and Navigation Code.

> **STATUS.** As of this date, no amendment to the California Harbors and Navigation Code has been proposed 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 specified period of time.
>
> In 1997 OSPR made preliminary inquiries to assess the scope of piloting performed by shipping company employees. OSPR requested that the Harbor Safety Committee convene a meeting of the Pilotage Subcommittee to discuss this recommendation with a view towards the development of rationale and legislative strategy. To date the Harbor Safety Committee has not responded to this request.

XIII.2. Require Pilots on Board Vessels Towing Barges Over 5,000 Long tons.

The U.S. Coast Guard should amend 46 C.F.R. 15.812 to change the provision for pilotage requirements by adjusting the limit of 10,000 gross tons for tank barges by amending Section 15.812(e) to read:

> "A licensed individual qualifying under paragraph (c)(2) of this section may serve as pilot of coast-wise seagoing tank barges or tank barges operating upon the Great Lakes totaling not more than 10,000 gross tons carrying cargoes subject to the provision of 46 U.S.C. Chapter 37, **or tank barges operating on the Bays of San Francisco, San Pablo and Suisun, carrying not more than 5,000 long tons of oil or other petroleum products as cargo**."

The Committee concluded there should be federal licensing requirements for the operation of tugs towing 5,000 to 10,000 long tons of oil or other petroleum products as cargo in order to ensure local knowledge of the Bays. The OSPR Administrator should request that the U.S. Coast Guard make this change to federal licensing requirements.

> **STATUS.** In 1997 OSPR reviewed this recommendation and, based on this review, requested that the Harbor Safety Committee convene a meeting of the Pilotage Subcommittee to discuss this recommendation with a view towards clarifying terms, developing rationale and implementing strategy. To date the Harbor Safety Committee has not responded to this request.

XIII.3. Amend Harbors and Navigation Code to Prevent Unlicensed Person From Performing Pilotage.

The Pilotage Subcommittee reviewed federal and state pilotage licensing. To prevent unlicensed persons from performing pilotage, it is recommended that legislative language in the California Harbors and Navigation Code be strengthened, by increasing 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 specified maximum penalty of $25,000, as follows:

> "(A) Every person who does not hold a license as pilot or as an inland pilot issued pursuant to this division, and who pilots any vessel into or out of any harbor or port of the bays of San Francisco, San Pablo, and Suisun, or who acts as a pilot for ship movements or special operations upon the waters of those bays, is guilty of a misdemeanor.
>
> "(B) If a vessel refuses or neglects to take and employ a pilot, the vessel, its master, owner operator, charterer, consignee or agent shall: (1) Forfeit and pay to a pilot suing for same a sum equal to the pilotage of the vessel, recoverable by an action in the courts of this state or the pilot may pursue his remedy by filing an action in admiralty in a United States Court, either in personal or in rem, to enforce the lien given him on the vessel, as the pilot may see fit and proper to do; (2) Be liable to pay a civil penalty of up to twenty-five thousand dollars, which penalty shall be payable to the general fund of the State of California; and (3) Be liable to the pilot for all costs and attorney fees incurred."
>
> **STATUS.** Senator Milton Marks introduced legislation (SB 1641) that was signed into law in 1996 requiring the use of pilots on San Francisco Bay. The recommendation has been carried out. No further action is called for.

XIV. UNDERKEEL CLEARANCE AND REDUCED VISIBILITY

1. Underkeel Clearance.

Many of the navigation channels within the Bay are subject to shoaling because of the nature of the Bay system which is more fully described in the section on harbor depths, channel design and dredging. Accurate tidal information is essential in order to calculate required underkeel clearances. This is particularly critical in the Bay region where one-foot clearances may occur in certain channels. The committee reiterates its support for "real time" accurate measurement of tides, such as the PORTS system recommended in Chapter II General Weather, Tides and Currents.

Recommendations

XIV.1. The committee determined that the following guidelines should be adopted for underkeel clearances of tank vessels carrying oil or petroleum products as cargo:

Underkeel clearance is the minimum clearance between the deepest point on the vessel and the bottom of the vessel in still water conditions. Tank vessels carrying oil or petroleum products as cargo shall maintain minimum underkeel clearances as listed below. The underkeel clearances are minimum standards during normal weather conditions. Masters and pilots shall at all times use prudent seamanship and shall evaluate the need for clearance in excess of these guidelines in adverse weather conditions, or when other circumstances would require such evaluation.

a. Vessels west of the Golden Gate Bridge: Ten percent (10%) of the vessel's draft.

b. Vessels under way east of the Golden Gate Bridge: Two feet (2)

c. Vessels at final approach to berth and at berth: Always afloat.

STATUS. On July 30, 1996, the Coast Guard published the Final Rule (effective November 27, 1996) regarding Operational Measures to Reduce Oil Spills for Existing Tank Vessels of 5,000 gross tons or more without double hulls. In part, the regulations required the Master to calculate the vessel's deepest navigational draft, the controlling depth of the waterway and the anticipated underkeel clearance. In addition, the Master and Pilot were to discuss the tankship's planned transit and required owner notification. Following issuance, the Coast Guard received comments expressing concern regarding the new provisions. Because of these concerns, the Coast Guard suspended the effective date of the owner notification part of the Final Rule. Coast Guard Headquarters is currently reviewing the comment submissions.

A working Group has been formed with representatives from the San Francisco Bar Pilots, Coast Guard, Port authorities and tankship companies to evaluate the process of calculating, in a dynamic condition, underkeel clearances with the goal of promulgating COTP guidance on minimum clearances for the San Francisco Bay Area.

2. Reduced Visibility

Fog is a well known problem in the Bay Area, particularly around the Golden Gate. It is most common during the summer, occasional during fall and winter, and infrequent during spring. Unfortunately the long-term fluctuations are not predictable but daily and seasonal cycles are.

Summer. Summer fog is dependent on several routine conditions. The Pacific High becomes well established off the coast and maintains a constant Northwest wind. It also drives the cold California Current south and causes an upwelling of cold water along the coast. Air closest to the surface becomes chilled so that the temperature increases with altitude. This forms an inversion layer at about 500–1,500 feet. Moist, warm ocean air moving toward the coast is cooled first by the California Current, then more by cold coastal water. Condensation occurs and fog will form to the height of the inversion layer. This happens often enough to form a semi permanent fog bank off the Golden Gate during the summer. Under normal summer conditions a daily cycle is evident. A sheet of fog forms off the Golden Gate headlands during the morning and becomes more extensive as the day passes. As the temperature in the inland valleys rise, a local low pressure area is created, and a steady in draft takes place. By late afternoon the fog begins to move through the Golden Gate at a speed of about 14 knots on the afternoon sea breeze. Once inside the bay it is carried by local winds. In general the north part of the bay is the last to be enveloped and the first to clear in the morning. There are times when the flow is so strong that the sea fog penetrates as far east as Sacramento and Stockton. If it continues for a few days, cooler ocean air replaces the warm valley air and causes the sea breeze mechanism to break down. Winds diminishes and the Bay Area clears for a few days. Slowly the valley reheats and starts the cycle again.

Winter. Winter fogs are usually radiation fog or “tule” fog. With the clear skies and light winds, land temperature drops rapidly at night. In low damp, places such as the Delta and central valley (where tules and marsh plants grow) it results in a shallow radiation fog (moist sea air reacting to cold land mass) which may be quite dense. In contrast to the summer fog that moves from sea to land at about 14 knots, the winter tule fogs move slowly seaward at about 1 knot.

Fog patterns can differ within the Bay region on the same day because of the unique geography of the Bay, which consists of two mountain ranges, the large expanse of bays, and a major river system. For example, on a summer day, a ship going under the Golden Gate Bridge may be in dense fog, while Benicia, its destination some thirty miles away, may be in bright sunshine. Conversely, on a winter day, tule fogs may completely obscure the Carquinez Strait, while high fog or sunshine may occur in the Central Bay. This phenomenon is more completely described in the book, *Weather of the San Francisco Bay Region,* by Harold Gilliam characterizes Bay region weather as: “Probably no comparable area on earth displays as many varieties of weather simultaneously as the region around San Francisco Bay. Because of these complex forms of the land, there is actually no such thing as Bay Region climate.”

Bay fog patterns occur in daily, weekly and seasonal cycles. A daily cycle might occur during the summer when fog rolls in from the cool ocean over gaps along the coastal hills at night, to be "burned off" by the morning sun. The incoming cool, heavy sea air begins to replace the rising, warm land air, and the valley nearest the Bay cools off. When the valley cools sufficiently, the fog system breaks down and the area will be fog-free for a few days until the entire process begins again. This cycle can continue weekly. However, depending on the location, an area may experience high fog, dense fog or relatively little fog. Depending upon high and low pressure systems over the continent, these cycles may be erratic.

Safety Issues Associated with Adverse Weather Conditions. Reduced visibility during periods of fog requires that mariners observe caution particularly when going under the bridges spanning the Bay. At times shipping is stopped in the Carquinez Strait when low fog reduces visibility to unsafe distances. Generally during periods of dense fog, ships remain at their dock. If a ship is underway, the decision might be made to anchor until there is improved visibility. In addition, radar targets may be difficult to obtain during periods of decreased visibility, especially images of small vessels. Due vigilance must be used in the more heavily traveled navigation lanes, where deep draft vessels cross movements with other large vessels. Notwithstanding, the Captain of the Port has the authority to prohibit movement of vessels within all or portions of the Bay during adverse weather conditions.

Because of the large size of the Bay (500 square miles), the longer distances traveled to the various ports, and the diverse weather conditions encountered in the Bay, mariners are dependent on accurate weather forecasting for vessel movements. To increase the reliability of Bay Area marine weather forecasts, the National Weather Service installed a weather radio devoted exclusively to marine weather data.

The National Weather Service pointed out that the new doppler radar is not capable of tracking weather patterns below 3,500 feet because of the radar's elevation above sea level. This is particularly important to Bay area mariners because wind patterns below 3,500 feet can radically shift in a short period of time, signaling an abrupt change in the weather. Because of the coastal hills, very localized wind conditions exist just outside the Golden Gate at the entrance to the harbor and else where in the Bay. In February, 1996, three container ships were significantly damaged by strong winds suddenly shifting in the Oakland Harbor. The cost to install a 'wind profiler' was estimated to be $250,000. However, funds for the 'wind profiler', which would provide real time wind information, have been denied. Until more sophisticated equipment can be installed, the National Weather Service is encouraging input on real time conditions from the maritime community by contacting the National Weather Service at (408) 656-1710 x245 or (800) 437-2689 and ask for extension 245.

Recommendations

XIV.2. Restricted Visibility. 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.

STATUS: No change to recommended guidelines.

XIV.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. This guideline acknowledges that the Bay region is a series of bays and rivers, in-Bay distances are long and that there is not a single Bay region climate, but a series of many microclimates with variable fog.

STATUS: No change to recommended guidelines.

XV. ECONOMIC AND ENVIRONMENTAL IMPACTS

The Harbor Safety Plan must identify and discuss the potential economic and environmental impacts of implementing the provisions of the Plan, and describe the significant differences in the restrictions that could vary from port to port within the geographic boundaries of the plan.

Economic Impacts

In order to make an economic assessment of the impacts of implementing the plan, recommendations which have a cost implication are identified with their potential economic impact. The following recommendations have a direct cost and an economic impact:

- **Tides and Currents.** Federal, State and/or local funding is necessary for NOAA to conduct frequent, up to date surveys of major shipping channels and turning basins, and for the San Francisco Marine Exchange to operate and maintain the P.O.R.T.S. system.

- **Harbor Depths, Channel Design and Dredging.** Conducting comprehensive annual condition surveys noting depths alongside and at the head of their facilities would be a cost for each facility owner or operator. Conducting more frequent, up to date surveys of channels known to shoal rapidly (i.e. Pinole Shoal Channel and Bulls Head Channel) would require an allocation of funds from the U.S. Corps of Engineers and NOAA.

  Establish a new, two way traffic separation scheme north of Alcatraz by lowering areas such as Arch Rock, Harding Rock, and Shag Rocks to a minimum of 55' MLLW would cost between $25 to $43 million of federal and state (local) funds. More precise estimates depend on Corps of Engineers studies to determine the material composition of the submerged rocks, the preferred method of engineering and on subsequent removal estimates.

- **Bridge Management.** The cost or installation and maintenance of energy absorbing fendering systems, bridge clearance gauges, water level gauges at bridge approach points, navigational lighting and racons on bridges over navigable waterways, where needed, would be borne by the individual bridge owners and operators such as the Union Pacific Railroad, CalTrans and the Golden Gate Bridge District.

- **San Francisco Vessel Traffic Service (VTS).** Expand VTS to north of the San Rafael Bridge and east of the Carquinez Strait and upgrade the existing VTS to include state-of-the-art technology (federal funds).

- **Tug Escorts.** The cost of tug escorts and standby tugs for ships and barges underway carrying more than 5,000 long tons of oil bulk as cargo in tug escort zones defined in the Plan are directly borne by the shipper.

- **Pilotage.** Future recommendations for pilotage may have cost implications.

- **Small Vessels.** Federal, State and/or Local funding is necessary to maintain and enhance the publication and distribution of pamphlets, brochures, videos, signs and other materials to increase boater education on shipping lanes, rules of navigation and safety guidelines for recreational boaters operating smaller vessels.

Each of the recommendations listed above has a cost that would be incurred by a commercial operator, port facility, or government agency if that recommendation were implemented. To that extent, these would be economic impacts of the Harbor Safety Plan. Generally these items of cost are either capital items (such as new navigational equipment on bridges) or additional duties for an established agency.

The economic impact of the Harbor Safety Plan appears to fall equally on government agencies and private industry. The Corps of Engineers, NOAA, bridge owners and operators, and each port and facility operator would be required to spend money to improve facilities they own or operate in order to meet the recommendations of the Harbor Safety Plan. In addition, private industry would be required to meet the cost of escort tugs and possible increased pilotage.

Differences in Restrictions from Port to Port

Eight ports are within the geographic boundaries of the Harbor Safety Plan: San Francisco, Oakland, Encinal Terminals, Richmond, Redwood City, Benicia, Sacramento, and Stockton. Nothing in this Plan would disadvantage anyone of these port as compared to any other port within the plan area.

Environmental Impact

San Francisco Bay is a unique geographical area. It is the largest estuary on the Pacific Coast north of South America and south of Alaska 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.

Because of its size and shelter from the open ocean, San Francisco Bay is one of the most important harbors in the world. San Francisco Bay is the fifth busiest port in the United States in total ship calls and in deadweight tons. Reflecting the trend in total U.S. commodities, a large percentage of the material shipped is petroleum. Chemical shipments are also substantial. Although popular, the Bay has a number of challenges to navigation, such as shallow waterways, narrow shipping lanes, vessel traffic, strong tides and currents, and occasional bad weather conditions, such as dense fog and strong winds.

The Harbor Safety Plan has increased the level of navigational safety for the San Francisco Bay Region and the Ports of Sacramento and Stockton.

A major oil spill accident could cause millions of dollars in damage to the marine environment, adversely affecting a variety of Bay resources including wildlife habitats, water quality, commercial and recreational fishing, recreational areas, businesses, personal property and human safety. San Francisco Bay is part of the Pacific Flyway; in the winter months over one million birds use the area which could be severely impacted by a sizeable oil spill. 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. Just outside the Golden Gate, several marine sanctuaries cover some of the most productive coastal waters in the world. Spilled oil and certain clean-up operations can threaten the different types of marine habitats and other Bay resources.

As mentioned above, the Harbor Safety Plan has increased navigational safety throughout San Francisco Bay, thereby reducing the likelihood of a maritime accident that could result in the spill of a hazardous material, such as oil. Further, the Harbor Safety Committee, 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 regularly meet to develop additional strategies to further safe navigation and oil spill prevention and update the Harbor Safety Plan accordingly. As such, the Harbor Safety Plan has an overall beneficial impact on the environment since it furthers navigational safety and oil spill prevention, thereby helping protect the Bay from the adverse environmental impacts of a potential oil spill.

XVI. PLAN ENFORCEMENT

The Oil Spill Prevention and Response Act charges that the Harbor Safety Committee ensure that the provisions of the plan be fully and regularly enforced. Traditionally, the Coast Guard has been responsible for the regulation of vessel movements and inspections through the authority vested with the Captain of the Port. Within the geographic boundaries of the Harbor Safety Plan, almost all oil terminals are privately operated and outside of the jurisdiction of local port authorities, with the exception of Pacific Gas and Electric power plant terminal at Pier 70 in the Port of San Francisco, and Gibson Oil Terminal at the Port of Redwood City. Therefore, the Coast Guard has been the mainstay of enforcement within the plan boundaries, and it is expected that the Coast Guard will continue in this role.

Under the Act, the State Lands Commission and the Department of Fish and Game have dramatically increased roles and enforcement responsibilities. The State Lands Commission, along with facilities inspection, inspects vessels that are moored alongside the above-mentioned privately operated terminals, and monitor the cargo transfer operation. In the event, of a violation, and depending upon the nature of the violation, the appropriate state or federal agency is notified. The Department of Fish and Game is charged with the enforcement of state regulations under the Act and will initiate vessel inspections similar to that which the Coast Guard is already doing, and has the power to impose criminal and civil penalties for violations.

Tug Escorts are monitored by the Clearing House. The Clearing House will confirm that all applicable tankers are escorted by an appropriate tug, and that the escort tug is on station prior to the movement of the vessel. In the event that the tug is not on station, the Clearing House contacts the pilot, the master of the vessel, and the shipping company and/or agent and advise them accordingly. The vessel is not to move until the escort tug is on station. The Clearing House notifies the Department of Fish and Game if the vessel moves without escort. In the event that the tug breaks down during an escort, the master and the pilot will determine the safest course of action, whether to stop, to return, or to proceed.

Plan Review of the Harbor Safety Plan is mandated to take place on or before June 30th of each year. At this time, all aspects of the Harbor Safety Plan are assessed and the findings and recommendations for improvements are sent to the Administrator. Annual review will help ensure full, regular, and uniform enforcement.

Tug Escort Violations, 2002

Since the inception of the Tug Escort regulations in 1993 the trend on the number of reported violations has continued to decline. There were no reported tug escort violations for the San Francisco Bay area during the 2002 calendar year. The only enforcement activity was a $10,000 Administrative Civil penalty settlement with one operator for multiple crew training violations from previous years.

Recommendation

XVI.1. Coordination of Enforcement Responsibilities. 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. Cooperation and coordination between agencies will minimize enforcement of all federal, state, and local regulations. This cooperation is essential since, relative to the Harbor Safety Plan, the Coast Guard is the primary enforcement agency for federal regulations, and the State Department of Fish and Game is the primary enforcement agency for state regulations.

STATUS. No further action is necessary.

XVII.OTHER: SUBSTANDARD VESSEL INSPECTION

Substandard Vessel Examination Program

Recommendation

XVII.1. Support the U.S. Coast Guard vessel examination program of targeting substandard vessels in the Bay.

STATUS. Beginning May 1, 1994, the Coast Guard implemented a revised vessel boarding program designed to identify and eliminate substandard ships from U.S. waters. The program pursues this goal by systematically targeting the relative risk of vessels and increasing the boarding frequency on high risk (potentially substandard) vessels. Each vessel's relative risk is determined through the use of a Boarding Priority Matrix which factors the vessel's flag, owner, operator, classification society, vessel particulars, and violation history. Vessels are assigned a boarding priority from I to IV with priority I vessels being the potentially highest risk. This program also aligns Coast Guard efforts with international initiatives through reliance upon a two-tiered boarding process where the greatest effort, and most detailed examinations, are reserved for the highest risk vessels.

The International Maritime Organization (IMO) adopted an amendment to SOLAS with provisions entitled *"Special Measures to Enhance Marine Safety"* which became effective January 1, 1996. These provisions allow for operational testing during Port State examinations to ensure Masters and crews are familiar with essential shipboard procedures relating to ship safety.

The Vessel Boarding Branch (VBB) continued its mission in identifying and eliminating substandard foreign commercial vessels from US waters by use of the Coast Guard's risk-based boarding priority matrix system. In calendar year 2000, the Captain of the Port, San Francisco Bay detained 6 vessels due to major safety discrepancies under SOLAS, other IMO conventions and U.S. law, including the arrest of one vessel's captain for falsifying records and making false statements to Coast Guard officials. Inadequate crew performance accounted for 2 of these vessels (33.3%), poor material conditions accounted for 2 vessels (33.3%) and violations of the ISM code accounted for another 2 vessels (33.3%) including one tankship that was found to have ballast tanks in an explosive condition. Overall, VBB boarded 373 (16%) of the 2287 foreign vessels that transited San Francisco Bay. This translates into a detention ratio of nearly 2% of the vessels boarded.

XVIII.HUMAN FACTORS WORKING GROUP AND PREVENTION THROUGH PEOPLE WORKING GROUP

1. Human Factors Working Group

XVIII.1 In Y2000, the Human Factors Working Group was assigned only one topic. It met once on February 3, 2000.

Scope and Purpose

Scope: San Francisco Bay and Tributaries: To study the movement of ships along a continuous berth or pier for the purpose of repositioning.

Purpose: To review and make a recommendation to the Harbor Safety Committee as to the risk of line hauling vessels along the dock in San Francisco Bay. The review and recommendation should consider the relative safety of the operation and mitigating factors that reduce the level of risk.

Process:

Reviewed current operations: We had representatives from every major terminal in the Bay that regularly engaged in line hauling operations. We also had members of the Tanker Operators, Ship Operators, Tugboat service providers, San Francisco Bar Pilots, OSPR, State Lands Commission, the United States Coast Guard and a Naval Architect/Marine Engineer. We went through, in detail, the processes and procedures currently employed in the industry when ships are line hauled.

Preformed a Risk Assessment: The Group then began the process of Risk Assessment. It reviewed historical data from the KURE incident in Humboldt Bay. We took a look at all casual factors and changes in practice taken as a result of those incidents.

CONCLUSIONS

- Terminal operations in the Bay appear to be healthy. "Few, if any, recordable incidents."
- A pre-op plan is critical.
    - This includes a face-to-face pre-shifting conference between ship and facility
- Captains are discouraged by economics to hire tugs. Terminals and facilities should seriously look at Criteria that will help justify then requiring the use of a tug to protect the terminal property. Terminals should develop Criteria for when tugs should be used, i.e. environmental conditions.

- Sharing of information by operators is a valuable tool that should be encouraged. All terminals agreed to look at the best sharing practices.

- Pilot participation in the majority of these operations would not bring any additional level of safety. Unusual or longer moves involving tugs may warrant participation of a pilot.

- The key to a good record is in existing practices and procedures. These are both formal and informal.

- This forum did not address more irregular line haul moves that take place from time to time in the Bay, such as vessels shifting one or more full berths for repairs or during layup.

Recommendation

The Working Group's recommendation is that the terminals should look at formalizing their practices and procedures into policies to ensure continued safe operations as staff turnover occurs.

2. Prevention through People Working Group

XVIII.2. Recent analysis indicates that up to 80% of all marine casualties are caused by people, not material or systems' failures. Prevention of accidents through examining human and organizational factors is receiving increased attention by government and industry as the maritime industry becomes more mechanized.

The Prevention through People Working Group, (hereafter PTP), was appointed by the Harbor Safety Committee of the San Francisco Bay Region on October 16, 1997.

The membership in the PTP Working Group varies depending on its project schedule. All meetings are attended by representatives of the Secretariat, VTS, MSO, Bar Pilots, State Lands Commission, and such other members of the Harbor Safety Committee as may be interested in its proceedings.

STATUS: Margot J. Brown, National Boating Federation, remains as the Chair of the PTP Working Group. Meetings take place at least once a month, usually at the offices of the State Lands Commission Marine Facilities Office in Hercules, CA.

The Working Groups main emphasis remains in the area of communications. The "Guide to Recreational Vessel Communications" was printed and distributed in 2001, thanks to funding provided by the California Department of Boating and Waterways.

Work has proceeded on a brochure entitled "Where the Heck is Collinsville", a guide to marine geography and facility names in the San Francisco Bay area. The Office of Spill Prevention and Response will sponsor publication of this guide, early in the year 2002. "Mariner, do you speak Channel 14" will have to be reprinted as a companion to the above brochure.

XIX. WORK GROUP REPORTS

FERRY OPERATORS WORKGROUP YEARLY REPORT

With the resolution of the wake damage issues last year the ferry operators have not raised any further concerns or comments requiring action by the workgroup.

As a result of that the workgroup has not scheduled or held meetings for this period.

July 8, 2003

TO: Captain Lynn Korwatch, Clearinghouse Executive Secretary

FROM: Captain Larry Teague, HSC Navigation Work Group

SUBJECT: Annual Report

Captain Korwatch,

The following is a list of the Accomplishments and Goals of the Navigation Work Group:

ACCOMPLISHMENTS:

1.) The Avon Turning Basin project has been carried to conclusion unsuccessfully. The Federal project was suspended, however, the oil terminals and the SF Bar Pilots have worked together to establish parameters and protocols to improve navigation safety of tankers turning in the vicinity of Avon. It was established that the terminals would provide quarterly soundings of the area, and provide the establishment of private navigation aids to facilitate safe turning.

2.) Through meetings and discussions with the Army Corps of Engineers, the Corps now publishes surveys and soundings on a public website that is easily accessible and user friendly.

3.) The Navigation Work Group continues to work with all ports in the San Francisco Bay Area on channel improvement projects.

GOALS:

1.) To work with the Army COE to expand the website to include surveys from the Sacramento and San Joaquin Rivers.

Respectfully submitted,

_____

Captain Larry Teague

July 8, 2003

TO: Captain Lynn Korwatch, Clearinghouse Executive Secretary

FROM: Captain Larry Teague, HSC Navigation Work Group

SUBJECT: Annual Recommendations

Captain Korwatch,

The following is a list of the Recommendations of the Navigation Work Group:

RECOMMENDATIONS:

4.) In the Membership listings, under Pilots Organizations, please correct the San Francisco Bar Pilots address to: Pier 9, East end, San Francisco, California, 94111.

5.) Under Weather (and anywhere else it may be referenced in the Plan), correct the PORTS phone number to reflect the new number.

6.) SF Bay General Anchorages 8 and 9 have recently been enlarged to accommodate the larger ships and increased usage. The US Coast Guard established a temporary extension to Anchorage 8 during the recent labor dispute, which caused a large number of ships to be delayed at anchor in the Bay. Now the USCG is proposing federal regulation to define the boundaries of the temporary anchorage and a mechanism to activate it on short notice. The navigation work group recommends that the HSC endorse the proposed change by the USCG and include it in the Plan.

7.) The Navigation Work Group recommends that in section IV (Anchorages), under IV.1, Status, that the last sentence of that paragraph be eliminated, as it is very impractical, and not used. As presently worded, many ships would not be able to maneuver into or out of the Anchorage.

Respectfully submitted,

_____

Captain Larry Teague

Prevention Through People Work Group
Accomplishments

From: Margot Brown

Subject: PTP Annual Review

STATUS; Margot J. Brown, Executive Director, National Boating Federation, remains as the chairman of the Prevention Through People Work Group of the Harbor Safety Committee.

The Work Group normally meets once monthly, or more frequently when deemed necessary. Meetings are usually held at the State Lands Commission offices in Hercules.

Members of the work group usually include, but are not restricted to, a representative from OSPR, State Lands Marine Division, NOAA, USCG Vessel Traffic Service, Dept. of Boating and Waterways, a bar pilot, SF Marine Exchange representative, and the audiovisual team of the Dept. of Fish and Game.

The PTP Work Group completed the brochure entitled "Where the Heck is Collinsville", printed in color by OSPR, and has been widely acclaimed and distributed.

The Work Group also revised and republished, in color, the brochure entitled "Mariners, Do You Speak Channel 14?"

Work has begun on a safety video, entitled "Sharing the Bay". The script has been written by the Work Group, and extensive segments have been taped by the audio/video unit of the Dept. and Game. Completion of this video, and its public release, is anticipated no later than spring 2004.

14 August 2003

TUG ESCORT WORK GROUP

FROM: Joan Lundstrom, Work Group Chair

SUBJECT: Annual Report

Last Year's Goals:

Permanent Tug Escort Regulations for the Bay have been in effect since 1997. The Tug Escort Work Group continued its final review of the regulations, not necessarily to make changes, but to update industry practice, experience and relevant studies. Last year we completed a comprehensive study of the tug/tanker matching matrix and concluded the matrix remained valid and should not be modified. This year we concluded our review of the following areas:

- Full Redundancy: Standards in Regulations?
- Clearinghouse: Scope of Work
- Fittings on Tankers: Information Only
- In addition, the Work Group reviewed the 1998 Harbor Safety Committee recommendation that vessels carrying dangerous cargo be required to have tug escort. This recommendation would require approval by the State Legislature.

Accomplishments:

1. The Work Group, comprised of representatives of the Harbor Safety Committee, and a broad range of representatives of the maritime industry, completed its review of the existing Tug Escort Regulations, focusing on the categories described above. The Work Group did not identify outstanding issues or problems that needed to be addressed and recommended to the full Harbor Safety Committee that no changes to the regulations were recommended at this time.
2. The Tug Escort Work Group held a series of meeting to discuss whether the Harbor Safety Committee should alter its recommendation that:

> "Working with the Harbor Safety Committee, the Administrator should propose legislation to require that vessels carrying certain dangerous chemical cargoes in enough quantities to pose a risk be required to have tug escort(s) in San Francisco Bay."

The Work Group consisted of representatives of tanker, tug and terminal operators, pilots, the Pacific Merchant Shipping Association, U.S. Coast guard, BCDC, State Lands Commission and OSPR. The Group extensively discussed the definition and quantities of dangerous cargoes; the pattern of vessel movements of this category of vessel in the Bay; evidence of "problem ships" and IMO requirements for ship design.

Definition of Dangerous Cargoes and Quantities Carried

We reviewed Federal Regulation 33CFR160 of "certain dangerous cargo". However, the Coast Guard noted that cargo listings do not include all dangerous cargoes carried. The San Francisco Marine Exchange uses Lloyd's Register for tracking chemical tanker arrivals in the Bay. Lloyd's Register and IMO define chemical tankers. In reviewing the varying definitions of chemical tankers, the Work Group noted that one vessel could have as many as 50 individual tanks carrying a variety of chemicals and petroleum. The most dangerous "cargoes of concern" are typically carried in the center of the ship between the outer tanks and double bottom tanks.

The Work Group debated for several meetings on the difficulty of crafting a definition of "certain dangerous cargoes" and of defining "sufficient quantities to pose a risk" which could be translated into state regulation. Alternatively we discussed whether to target certain of the most dangerous cargoes, but were faced with the same quandary of a clear definition.

Movement of Chemical Tankers in the Bay Region

To better understand the pattern of chemical tanker activity in the Bay Region, the Work Group analyzed chemical and LPG tanker movements, as provided by the Marine Exchange, for the calendar year 2001.

- 87 chemical tanker arrivals; 56 different vessels. Two tankers arrived four or more times. The ships called at the Port of Stockton.
- Chemical tanker movements: 292 total movements; 237 non-escorted movements; 55 tug escorted movements (about 20%). Note escorted ships had 5,000 or more long tons of petroleum on board, so required a tug escort.
- 18 LPG arrivals, 9 different vessels. The ships called at various refineries and the Ports of Stockton and Sacramento.

"Problem" Ships

A Coast Guard representative reported no steering or propulsion failures or Captain of the Port Orders were issued in 2001 for any of the chemical or LPG tankers listed by the Marine Exchange.

Lt. Diana Cranston reported that, post 9/11, the Coast Guard Sea Marshal Program requires 96-hour Advance Notice of Arrival of vessels. Lt. Cranston said there is no database identifying chemicals and quantities carried. Under the Sea Marshal Program, the Coast Guard escorts LPG and anhydrous ammonia tankers, which are considered "extremely dangerous cargo", from the Sea buoy outside the Golden Gate to berth. The Coast Guard escorts are security escorts and do not constitute a tug escort.

Regardless of the recently instituted Sea Marshal Program, the Captain of the Port has authority to detain "problem vessels" and to require tug escorts under Port State Control. As an aid, the Coast Guard tracks "problem vessels" using their PSIX database to track SOLAS interventions on a worldwide basis.

The Work Group also reviewed Port State Control information compiled on ship deficiencies and detentions of the 56 chemical tankers arriving in the Bay Region in 2001. The lists, compiled from Equasis, reported Port State Control actions taken against a vessel worldwide for the past three to four years. There were no patterns of problems or issues tied to mechanical failure of a vessel that would be grounds for requiring a tug escort. Ship deficiencies covered a broad range of issues from crew certification, fire and life safety to maintenance of propulsion and auxiliary machinery.

Ship Design

The Work Group noted that most chemical tankers are double-hulled ships subject to strict international standards and close vetting review. We analyzed the 2001 list of chemical tankers transiting the Bay for IMO classification type. The IMO classifies chemical tanker design as follows:

Type I: "A chemical tanker intended to transport Chapter 17 products with very severe environmental and safety hazards which require maximum preventive measures to preclude an escape of such cargo. Type 1 ships are double-skin tankers with higher cargo tank integrity requirements than Type 2 ships."

Type II: "A chemical tanker intended to transport Chapter 17 products with appreciably severe environmental and safety hazards, which require significant preventive measures to preclude an escape of such cargo. Type 2 ships are double-skin tankers."

Type III: " A chemical tanker intended to transport Chapter 17 products with sufficiently severe environmental and safety hazards, which require moderate degree of commitment to increase survival capabilities in a damaged condition. Type 3 ships are single-skin tankers with a certain survivability standard higher than for oil tankers."

The records showed the majority of chemical tankers during this period were Type 2, double-hull, affording a higher level of ship safety than most oil tankers.

Conclusions and Recommendations:

After extensive analysis and discussion, the Tug Escort Work Group and the Harbor Safety Committee concurred that the previous recommendation be

rescinded to propose state legislation requiring tug escorts for vessels "carrying certain dangerous chemical cargoes in enough quantities to pose a risk" in San Francisco Bay, based on the following reasons:

- It was extremely difficult to define dangerous cargoes and quantities which could by translated into legislation.
- Thorough analysis of this category of vessels in the Bay in calendar year 2001 did not reveal a pattern of problems or inadequate ship design.
- The Coast Guard has the authority through Port State Control to require tug escorts and to detain "problem ships" if necessary.

The Work Group also considered whether to recommend that LNG vessels have mandatory tug escorts. At present, no LNG terminals exist with the Bay Area. A feasibility study is being undertaken whether to site a terminal at Mare Island, Vallejo. Should this proposal become more likely, the Work Group may reconvene to address the issue. No recommendation was made at this time to require tug escorts for LNG vessels.

Goals for Next Year:

No further meetings are planned at this time.

Memorandum

Date: June 12, 2003
To: Harbor Safety Committee, San Francisco Bay Region
From: Len Cardoza
Subject: Underwater Rocks Work Group 2002 Annual Report

The Purpose for the San Francisco Central Bay Rock Removal Project is to take actions to prevent groundings on the rock mounds in Central San Francisco Bay near the existing deep-draft channels. The prevention of groundings could significantly reduce the risk of oil and fuel spills from occurring in the Central Bay. These actions would further serve to improve navigational safety and reduce significant environmental and economic damages within all of San Francisco Bay.

Summary: It is unlikely that the Corps of Engineers will proceed with a project to prevent groundings on the rock mounds in Central San Francisco Bay near the existing deep-draft channels, due to the extremely low benefit to cost ratio as discussed below. Therefore, the Rocks Work Group will work with the California State Lands Commission and Harbor Safety Committee to bring the current work nearing completion to a logical (useful) point and prepare Feasibility Study document (Reference Report) stating the conclusions noted above. The Work Group will also evaluate alternate means of Federal and non-Federal funding to pursue the project

1. 2002: The Underwater Rocks Work Group accomplished the following goals and objectives during calendar year 2002:

a. Technical Studies. The Underwater Rocks Work Group Worked closely with the Corps of Engineers to complete the following key technical studies in support of the Federally authorized Feasibility Study to investigate the lowering of rocks identified as hazards to navigation in the Central San Francisco Bay, and posted them on the San Francisco District, Corps of Engineers Website, www.spn.usace.army.mil/ (Click on publications/studies for reports referenced below).

- Risk Model. The CoE completed the Risk Assessment Model for the proposed project in October 2002. The report states that the predicted frequency of a tanker grounding at one of the submerged rocks (controlling depths of 33-36 feet MLLW) located northwest of Alcatraz Island (Harding, Shag, and Arch) is once every 658 years. The predicted frequency of a tanker grounding at Blossom Rock, southeast of Alcatraz Island, is once every 654 years. The predicted frequency of a non-tanker (primarily a containership) grounding at one of the northwest rocks is once every 161 years. The predicted frequency of a non-tanker grounding at Blossom Rock is once every 1603 years. The significantly lower frequency for non-tanker groundings at Blossom Rock is due to the lower depth of the submerged hazard (40 feet). The amount of oil outflow is dependent on the size and type of the vessel and the speed at which it strikes the rock, ranging up to 8 million gallons. The Risk Model Report computed the probability of failure of

a well-maintained vessel. The Rock Group stated that a number of vessels calling at San Francisco Bay's ports and terminals have experienced operational and equipment failures. The CoE will investigate if this observation will impact risk analysis.

- Oil Spill Model. The CoE completed the Oil Spill Model in June 2002. There is no resolution, however, between total estimates of damage to the region; and damages which are attributable toward the determination of the National Economic Development (NED) plan (to justify Federal participation). The cost of mitigation was not discussed in the Oil Spill Model. This can greatly affect the total project cost. Estimates for required mitigation will be prepared, based on the recommended plan, if the project goes forward. Trajectories and economic impacts were simulated from a spill at Shag Rock (representative of Shag, Harding, and Arch Rocks). A spill at Blossom Rock, however, will theoretically result in a significantly different trajectory (more towards the south bay and less towards the north and west). A listing of the contributing reports follows:

1. Preliminary Report, Oil Spill Type & Volume Analysis (all rocks), Feb 2002
2. Draft Final Report, Bio-Economic Oil Spill Modeling - Shag and Blossom Rocks July 2002
3. Final Report, Bio-Economic Oil Spill Modeling - Shag Rock, May 2002
4. Final Report, Response Cost Modeling - Shag Rock, May 2002
5. Final Report, Socioeconomic Cost Modeling - Shag Rock, May 2002
6. Final Report, Socioeconomic Cost Modeling - Blossom Rock, July 2002
7. Draft Report, Response Cost Modeling - Blossom Rock, July 2002

b. Project Alternatives. The Work Group reviewed a listing of preliminary project alternatives, as part of the plan formulation process for the F-3 Conference (described below). These include structural measures (rock lowering alternatives and channel/lane rerouting) and non-structural alternatives (enhanced tug escort measures, clean-up response, and aids to navigation). The plan formulation process also included a discussion of construction techniques and disposal of rock rubble; environmental comparisons; and the no action (without project) alternative necessary to complete the NEPA/CEQA process.

c. Benefit to Cost Ratio. The results of the Risk Assessment Model, discussed above, were incorporated with the theoretical spill damages. This resulted in the probability of an accident, and the cost of cleanup / remediation, over the 50 year design life of the project (project benefits). Project benefits are currently estimated at $12.48 million of *savings* by avoiding a spill at the three northwestern rocks (Harding, Shag, and Arch). Project costs include the construction cost estimates to lower the rocks, together with mitigation of environmental impacts. Construction costs for the lowering of Harding rock are currently estimated at $32 million. This results in a benefit/cost ratio of .39 for

Harding Rock alone. Construction costs to lower all three of the northwesterly rocks are estimated at $221 million, providing a benefit/cost ratio of 0.056. This is significantly below the 1:1 ratio generally used as the minimum for Federal participation in Corps of Engineers civil works projects. The Corps of Engineers project team and Work Group reviewed all input into the benefit to cost ratio. Preliminary analysis indicated that costs of construction might be understated due to the particular challenges of working in Central San Francisco Bay (high sediment loads, significant depths, adverse currents, ocean swells, high winds). Preliminary analysis also indicated that the benefits might be understated (savings of costs associated with cleanup). Refined/adjusted costs/benefits, however will not likely change the low benefit to cost ratio to a significant degree.

d. F-3 Conference. The F-3 Conference is the first conference with the CoE leadership above District level. It is also referred to as the Feasibility Scoping Meeting. The conference focuses on the present project area conditions, and the economic analysis / risk assessment for the project, together with preliminary alternatives analysis. The policy issue asked of Headquarters, United States Army Corps of Engineers (HQUSACE) is how to accrue the benefits from avoiding the catastrophic environmental damages, which would result from a spill in the Bay. This information, in turn, will establish if the project is consistent with the National Economic Development Plan (NED) policy that the Corps of Engineers must operate under in civil works projects. The evaluated structural alternative involves lowering the 3 northern rocks (Harding, Shag and Arch). Noting the apparently inadequate benefit-to-cost ratio described above, the central policy question to be addressed at the F-3 Conference is as follows: *Can the study consider the feasibility of the structural alternative under the Federal objective for National Ecosystem Restoration (NER) since the lowering of the rocks would reduce the risk of a catastrophic loss of species and habitat from an oil spill created by grounding on one of the three rocks.* If the structural alternative goes forward as a NER project, the Work Group strongly recommends early consultation with Federal / State resource / regulatory agencies. The Work Group collaborated with the Corps of Engineers to prepare and disseminate documentation in advance of a teleconference that was held in January 2003.

e. EIS/R. The Work Group participated in the review and prepared comments on the 50% Administrative Draft EIS/R associated with the Project's Feasibility Study. The Work Group assisted the CoE with the development of a list of alternatives to prevent groundings on the rock mounds in Central San Francisco Bay near the existing deep-draft channels. The alternatives reflect three general categories, in addition to the no project alternative:

- Rock reduction. Reduce (lower) all or some combination of the identified submerged hazards to navigation (Harding, Shag, Arch, Blossom Rocks and the unnamed shoal west of Alcatraz Island). The rock reduction alternative will also include discussion and analysis of alternative methods for removal and disposal.
- Re-align / construct new channels. Dredge to widen and deepen existing San Francisco Bay Traffic lanes

- Operational Restrictions. Incorporate the work by the Harbor Safety Committee to continue to refine tug escort regulations and/or other operational restrictions (vessel speed, piloting, two way traffic, etc.).

The Work Group and CoE also discussed methodology of reducing the rocks (boring/tunneling/blasting and/or abrasion). Alternatives for the disposal/re-use of the excavated rock rubble will also be an important consideration. There may be impacts to general navigation associated with the extensive anchoring systems required for work (detailed geotechnical investigation; boring/blasting; excavation of rubble). The project alternatives will be evaluated on the basis of efficiency, effectiveness, cost, and acceptability. If the project continues, the selected alternative may involve some combination of the above (rock removal/operational restrictions/channel re-alignment)

f. Tug Escorts. The Work Group also evaluated the benefits and limitations of increasing tug escort requirements in the Bay in order to prevent groundings on the rock mounds in Central San Francisco Bay. There was general consensus between the Tug Escort Work Group, Underwater Rocks Work Group, and CoE that continued tug escort will be necessary even if all the rocks were to be lowered. Tugs stationed at Alcatraz may not be able to reach an out-of-control vessel in time to avoid a collision. It may be advisable to separate tanker traffic from container traffic when determining the cost of and need for additional tug support.

g. Dispersants. Roy Mathur, California State Lands Commission, gave a presentation to the Rocks Work Group about the advances in the Oil Spill Response Plans within the Bay. The increased use of dispersants over the next 10 years was addressed in the economic model for the Feasibility Study, raising uncertainty about actual benefits and impacts.

h. Draft Coordinating Act Report (CAR). The Work Group reviewed the draft CAR prepared by the U.S. Fish and Wildlife Service (FWS) for the project. Potential issues include, but are not limited to, blasting impacts; required mitigation as a result of loss of sub-tidal rocky habitat; effect on recreational fisheries; statistically based risk analysis (probability of an oil spill event and resulting damage); and potential changes in hydrology as a result of changes in bathymetry.

i. Office of Spill Prevention and Response (OSPR). Chris Klumpp, OSPR, gave a presentation on oil spill response planning and exercises in San Francisco Bay to the Work Group. The presentation included Area Contingency Plans (ACP), Site Information Spill Response Strategy (SISRS), Oil Spill Response Organizations (OSROs), response drills, Sensitive Site Exercise Program, and response resources in the San Francisco Bay. Response resources in the San Francisco Bay include oil booms, skimmers, vessels, human resources, storage (shoreside and waterborne), vehicles, communication equipment, portable pumps, command posts, and generators. The Work Group also discussed possible technological advances in the use of dispersants.

j. Construction Methods. St Louis District, Corps of Engineers, provided expertise to help develop cost estimates for removing (lowering) the rocks, based on similar projects.

These included, but are not limited to, explosive measures protected by "bubble curtains". The study also included other measures including rock dredges and chemical expansion.

2. 2003. The Underwater Rocks Work Group identified the following goals and objectives for calendar year 2003:

a. Conduct the F-3 Conference (Feasibility Scoping Meeting). The conference, conducted January 2003, focused on the present project area conditions, and the economic analysis / risk assessment for the project, together with preliminary alternatives analysis.

b. Terminate the Corps of Engineers' Feasibility Study since it is unlikely that the Corps of Engineers will proceed with a project to prevent groundings on the rock mounds in Central San Francisco Bay near the existing deep-draft channels, due to the extremely low benefit to cost ratio as discussed above. Complete ongoing work to a logical (useful) point. Prepare a Feasibility Study document (Reference Report) stating conclusions noted above. Recommend that the CoE Commander/Division Engineer issue a Public Notice stating that the Feasibility Study is complete with the recommendation that there is no Federal interest due to the low benefit to cost ratio.

c. Work with the California State Lands Commission and Harbor Safety Committee to address the following questions / concerns:

1. Evaluate alternate means of Federal funding to pursue project.
2. Evaluate alternate means of non-Federal funding to pursue project.

Plan Update Work Group Report

Goals for 2002

In 2002 a work group was formed to facilitate the annual update of the Harbor Safety Plan. The work group concluded that the process could be improved by reformatting the Harbor Safety Plan (HSP) to facilitate its annual update with a minimum of review and rewriting. The body of the plan would become the framework for the plan, and contain that information which is central to the plan, but not include information that changes from year to year, and is supportive in nature to the core. The annual work group and committee updates, appended to the end of the plan, would form the living portion of the document, and capture the work product from the year, including accomplishments against goals, the establishment of new goals and the plan for achieving those goal.

Accomplishments:

The following occurred in support of the 2002 initiatives;

- The entire plan document was sectioned out, and reviewed by the stakeholders with the goal of capturing the core information in the body, and identifying those portions that would be better suited to the annual update section. The goal of this review is not to rewrite the section, but rather to ensure the language or statements have not become dated or inaccurate over the last year.
- Work groups and stakeholders were assigned and submitted their annual updates for inclusion in the 2002 document.
- The updated document was reviewed and approved by the full membership of the Harbor Safety Committee.

Goals for 2003;

In 2003 the work group will endeavor to continue the process begun in 2002, by following a similar review process.

- Review the body of the plan to ensure the language or statements have not become dated or inaccurate over the last year.
- Have work groups and stakeholders submit their annual updates for inclusion in the 2003 plan document.
- Review the updated document with the full membership of the Harbor Safety Committee and have it approved during the summer of 2003.

Submitted to: Harbor Safety Committee of the San Francisco Bay Region
Submitted by: Scott Merritt, Plan Update Work Group Chair
Date: July 28, 2003

Ports Funding Work Group Report

1. Overview & Goal

The Physical Ocean Real Time System (PORTS) was originally designed, installed and maintained by N.O.A.A. with the intention of turning over the maintenance to local sources utilizing non-N.O.A.A. funding. N.O.A.A. will continue to provide technical support and verify (guarantee) the accuracy of the data provided the system is maintained to N.O.A.A. standards.

It is estimated that the annual cost of properly maintaining the system will be in the range of $175M. Over the past few years the system maintenance has been funded from several sources including the State General Fund (via sponsorship of Boating & Waterways [B&W]. With the current forecast for the State's budget shortfall it is unlikely that we will receive any significant support from the General Fund in the coming years.

This working group is tasked with attempting to come up with a method of funding the maintenance of PORTS on a continuing basis.

2. Process & Conclusions

Through a series of meetings and information exchange the work group;

- Looked at Potential Funding Sources
    - Reviewed the user groups and evaluated the potential for a user fee based system
    - Explored various regulatory/statutory options for funding
    - Examined the potential for commercial support of the system

From this look it was the consensus of the work group that the only potential avenue available to us at this time is a voluntary user fee request. The working group spent a lot of time on how realistic it was to assume this group could fund ports. The conclusion was that given B&W past support, and the significant number of members on the Harbor Safety Committee that represent the majority of key user groups, that there was a good opportunity to rally support for funding the system. The sheer number of participants should keep the individual burden carried by anyone group close to the value that group should perceive the system provides them. To that end the following to do list was created.

Accomplishments

- Developed and refined a white paper outlining the history and benefit of PORTS.
- Developed a contribution request letter, and determined an appropriate request amount by user group
- Received approval of the full Harbor Safety Committee to proceed with soliciting funds.

3. Goals for 2003

- Implement the request for funds letter to the user groups.
- Monitor the success of the program against system needs.
- Continue to follow and support Local, State and Federal funding opportunities.

Submitted to: Harbor Safety Committee of the San Francisco Bay Region
Submitted by: Scott Merritt, PORTS Funding Work Group Chair
Date: July 28, 2003

San Francisco Bay Harbor Safety Plan

GEOGRAPHIC LIMITS OF THE HARBOR SAFETY PLAN

VESSEL TRAFFIC LANE/
SHIP CHANNEL

123° 122° 121°

38°

YOLO

PORT OF SACRAMENTO

SACRAMENTO

Sacramento Deep Water Channel

SACRAMENTO

River

NAPA

SOLANO

SONOMA

Suisun City

Petaluma River

Napa River

PETALUMA RIVER BRIDGE

NAPA RIVER BRIDGE

Vallejo

RIO VISTA BRIDGE

MARIN

San Pablo Bay

Carquinez Strait

PORT OF BENICIA

Suisun Bay

Sacramento River

San Joaquin River

SAN

CARQUINEZ BRIDGE

BENICIA–MARTINEZ BRIDGE

Pittsburg

Martinez

ANTIOCH BRIDGE

Stockton Deep Water Channel

Pt. Reyes

San Rafael

RICHMOND–SAN RAFAEL BRIDGE

Pt. San Pedro

Explosives Anchorage

Anchorage 5

PORT OF RICHMOND

Richmond

Stockton

PORT OF STOCKTON

CONTRA COSTA

JOAQUIN

GOLDEN GATE BRIDGE

Ft. Baker

Ft. Point

SF–OAKLAND BAY BRIDGE

Ft. Bonita

PORT OF OAKLAND

Oakland

PORT OF SAN FRANCISCO

ENCINAL TERMINALS

LIGHTED HORN BUOY

SAN FRANCISCO

Anchorage 7

Anchorage 8

Farallon Is.

Explosives Anchorage

SAN

SAN MATEO BRIDGE

ALAMEDA

San Mateo

MATEO

DUMBARTON BRIDGE

PORT OF REDWOOD CITY

Redwood City

Moffett Field

SANTA CLARA

NOTE

The San Francisco Bay Harbor Safety Plan includes the marine waters of San Francisco Bay, San Pablo and Suisun Bays. For purposes of the plan, the easternmost boundary includes those waters subject to tidal influence up to the Ports of Sacramento and Stockton. The westernmost boundary of the plan is inscribed by a circle with a radius of six nautical miles centered on San Francisco Approach Lighted Horn Buoy (37°45.0'N, 122°41.5'W) including the Main Ship Channel to the COLREGS demarcation line. This includes the Offshore Vessel Movement Reporting System, Vessel Traffic Service and Traffic Separation Schemes within the area.

Scale 1:500,000
1 inch equals approximately 8 miles
0 25 Mi
0 25 Km

1927 NAD. Lambert conformal conic projection.
Shoreline shown is approximate Mean Sea Level.
Anchorage and Vessel Traffic Lane locations approximate.

JAC 404 5/98

MAP 1

Map produced by Joint California Coastal Commission/BCDC Oil Spill Program

Base Map Source: Map of the North Half of California, Scale 1:500,000, USGS, 1970

San Francisco Bay Harbor Safety Plan

BAY MARINE TERMINALS

MARINE TERMINAL

VESSEL TRAFFIC LANE/
SHIP CHANNEL

NOTE: The marine terminals shown are for general information to show where tankers and oil barges are known to call.

123° 122° 121°

38°

YOLO

SACRAMENTO

SACRAMENTO

NAPA

SOLANO

SONOMA

MARIN

SAN

CONTRA COSTA

ALAMEDA

SAN MATEO

SANTA CLARA

JOAQUIN

PORT OF SACRAMENTO

Sacramento Deep Water Channel

Sacramento River

Sulsun City

Ryer Island Ferry Terminal

RIO VISTA BRIDGE

Petaluma River

PETALUMA RIVER BRIDGE

Napa River

NAPA RIVER BRIDGE

Vallejo

San Pablo Bay

Carquinez Strait

PORT OF BENICIA

Huntway

Exxon

Avon

Wickland

Amorco

Shell

DFSP OZOL

Wickland

Tosco

Martinez

Pacific Refining

PG&E Pittsburg

Pittsburg

ANTIOCH BRIDGE

San Joaquin River

Stockton Deep Water Channel

Stockton

PORT OF STOCKTON

Pt. Reyes

San Rafael

RICHMOND–SAN RAFAEL BRIDGE

Paktank

Point Molate

PORT OF RICHMOND

Arco, Time Oil, Castrol, IMTT, Unocal

Richmond

Chevron Long Wharf

Explosives Anchorage

Anchorage 5

GOLDEN GATE BRIDGE

Ft. Bonita

SF–OAKLAND BAY BRIDGE

PORT OF OAKLAND

Oakland

ENCINAL TERMINALS

PORT OF SAN FRANCISCO

PG&E Potrero Pt.

Inbound

Outbound

LIGHTED HORN BUOY

SAN FRANCISCO

Offshore Pilot Station

Farallon Is.

SAN MATEO BRIDGE

San Mateo

Pilot Oil

DUMBARTON BRIDGE

PORT OF REDWOOD CITY*

Redwood City

Moffett Field

Scale 1:500,000

1 inch equals approximately 8 miles

0 25 Mi

0 25 Km

1927 NAD. Lambert conformal conic projection.
Shoreline shown is approximate Mean Sea Level.
Anchorage and Vessel Traffic Lane locations approximate.

JIS 407 5/88

MARINE TERMINALS

Location	Terminal Operator
1. City of Richmond	Chevron Long Wharf
2. Davis Point/Rodeo	Tosco, Rodeo
3. Selby	Wickland Oil
4. City of Martinez	Shell
5. " "	Tosco Amorco
6. " "	Wickland
7. " "	Tosco Avon
8. Point Molate/Richmond	City of Richmond, Caretaker Status*
9. Point San Pablo/Richmond	Paktank
10. Richmond Harbor	Tosco, Richmond
11. " "	ARCO
12. " "	IMTT
13. " "	Castrol
14. " "	Time Oil
15. City of Rodeo	Pacific Refining
16. Carquinez Strait	Defense Fuel Support Point (DFSP) OZOL
17. City of Pittsburgh	PG&E
18. Benicia Port Terminals	Exxon
19. " "	Huntway Refinery
20. Potrero Pt., Port of SF	PG&E
21. Port of Redwood City	Gibson Environmental (Pilot Oil), Caretaker Status*

* No Longer Conducting Transfers

MAP 2

Map produced by Joint California Coastal Commission/BCDC Oil Spill Program

Base Map Source: Map of the North Half of California, Scale 1:500,000, USGS, 1970

San Francisco Bay Harbor Safety Plan

VESSEL TRAFFIC SYSTEM
SAN FRANCISCO SERVICE AREA

Scale 1:500,000
1 inch equals approximately 8 miles

0 — 25 MI
0 — 25 Km

1927 NAD. Lambert conformal conic projection.
Shoreline shown is approximate Mean Sea Level.
Anchorage and Vessel Traffic Lane locations approximate.

123° 122° 121°
38°

YOLO
SACRAMENTO
SACRAMENTO
NAPA
SOLANO
SONOMA
MARIN
CONTRA COSTA
SAN JOAQUIN
SAN MATEO
ALAMEDA
SANTA CLARA

PORT OF SACRAMENTO
Sacramento Deep Water Channel
Sacramento River
RIO VISTA BRIDGE
Suisun City
Napa River
Petaluma River
PETALUMA RIVER BRIDGE
NAPA RIVER BRIDGE
Vallejo
San Pablo Bay
Carquinez Strait
CARQUINEZ BRIDGE
PORT OF BENICIA
Suisun Bay
BENICIA–MARTINEZ BRIDGE
Martinez
Pittsburg
ANTIOCH BRIDGE
San Joaquin River
Stockton Deep Water Channel
Stockton
PORT OF STOCKTON
San Rafael
RICHMOND–SAN RAFAEL BRIDGE
Pt. Richmond
PORT OF RICHMOND
Richmond
Anchorage 5
Pt. Reyes
SEE NOTE 1
OFFSHORE VESSEL MOVEMENT REPORTING SYSTEM
SEE NOTE 2
GOLDEN GATE BRIDGE
Pt. Bonita
SF–OAKLAND BAY BRIDGE
COLREGS LINE
PORT OF OAKLAND
Oakland
PORT OF SAN FRANCISCO
ENCINAL TERMINALS
LIGHTED HORN BUOY
OFFSHORE PILOT STATION
SAN FRANCISCO
Farallon Is.
Anchorage
Precautionary Area
SAN MATEO BRIDGE
San Mateo
DUMBARTON BRIDGE
PORT OF REDWOOD CITY
Redwood City
Moffett Field

- Existing Radar Site
- Expanded Radar Site
- Existing Radar/CCTV Site
- Expanded Radar/CCTV Site
- Expanded CCTV Site
- Existing Radar Coverage
- Existing CCTV/Radar Coverage
- No CCTV/Radar Coverage; Radio Communications Only
- Vessel Traffic Lane/Ship Channel

NOTE 1 — Radar coverage area for commercial vessels.
NOTE 2 — Radar coverage for vessels less than 100 feet in length.
NOTE 3 — Expanded sites effective November 1, 1996.

MAP 3

Map produced by Joint California Coastal Commission/BCDC Oil Spill Program

JHC, ACH 5/98

San Francisco Bay Harbor Safety Plan

TUG ESCORT ZONES

TUG ZONE BOUNDARY

② ④ ⑥ TUG ESCORT REQUIRED

① STANDBY TUG REQUIRED

VESSEL TRAFFIC LANE/ SHIP CHANNEL

123° 122° 121° 38°

PACIFIC OCEAN

SONOMA NAPA SOLANO YOLO SACRAMENTO MARIN CONTRA COSTA SAN JOAQUIN SAN MATEO ALAMEDA SANTA CLARA

Petaluma River · Petaluma River · PETALUMA RIVER BRIDGE · Napa River · NAPA RIVER BRIDGE · Vallejo · Suisun City · Suisun Bay · Carquinez Strait · San Pablo Bay · PORT OF BENICIA · CARQUINEZ BRIDGE · BENICIA–MARTINEZ BRIDGE · Martinez · Pittsburg · ANTIOCH BRIDGE · River Island Ferry Terminal · RIO VISTA BRIDGE · Sacramento Deep Water Channel · PORT OF SACRAMENTO · SACRAMENTO · Sacramento River · San Joaquin River · Stockton Deep Water Channel · Stockton · PORT OF STOCKTON

Pt. Reyes · San Rafael · RICHMOND–SAN RAFAEL BRIDGE · Explosives Anchorage · Anchorage 5 · PORT OF RICHMOND · Richmond · GOLDEN GATE BRIDGE · Pt. Bonita · COLREGS LINE · LIGHTED HORN BUOY · OCEANIC HDO STATION · SF–OAKLAND BAY BRIDGE · PORT OF OAKLAND · Oakland · PORT OF SAN FRANCISCO · ENCINAL TERMINALS · Anchorage 9 · Anchorage 8 · Explosives Anchorage · SAN FRANCISCO · Farallon Is. · SAN MATEO BRIDGE · San Mateo · DUMBARTON BRIDGE · PORT OF REDWOOD CITY · Redwood City · Moffett Field

Scale 1:500,000

1 inch equals approximately 8 miles

0 25 Mi

0 25 Km

1927 NAD. Lambert conformal conic projection.
Shoreline shown is approximate Mean Sea Level.
Anchorage and Vessel Traffic Lane locations approximate.

JMC ACH 5/99

TUG ZONES

① From a line drawn between Pt. Bonita Light through Mile Rock Light to the shore (COLREGS Demarcation Line), eastward to the Golden Gate Bridge.

② From the Golden Gate Bridge, south to a line between the southern tip of Bay Farm Island and the southeastern tip of Pt. San Bruno Peninsula; and north to a line between Pt. San Pablo to Light Buoy "4", to Light Buoy "5", to Pt. San Pedro.

③ From the south end of Zone 2 to one mile north of the San Mateo Bridge.

④ From one mile north of and to one mile south of the San Mateo Bridge.

⑤ From the eastern boundary of Zone 2 to the western approaches of the Carquinez Bridges at Light Buoy "15".

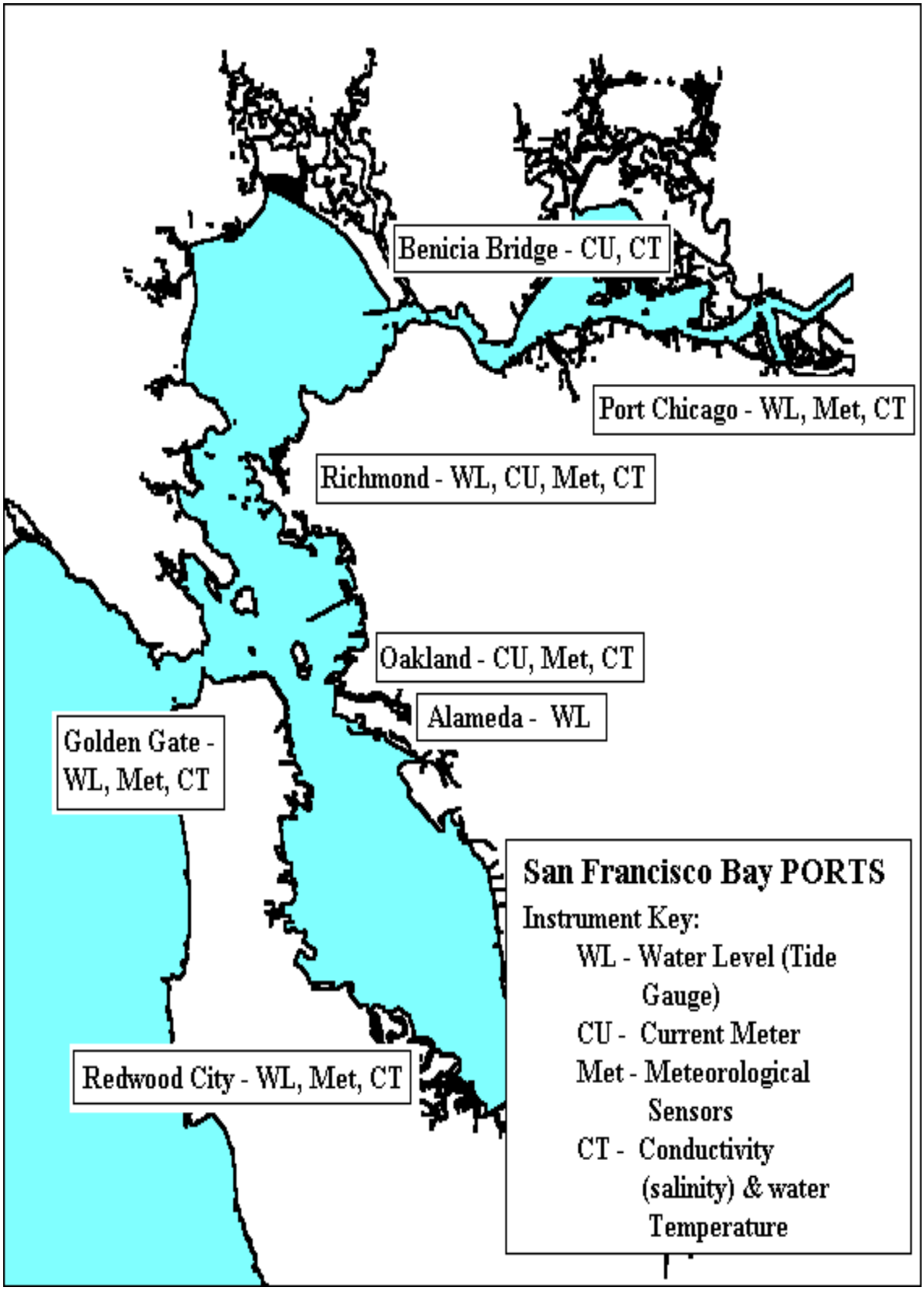
⑥ From Light Buoy "15", through the Carquinez Strait, north on the Sacramento Ship Channel to one mile beyond the River Island Ferry Terminal and east on the San Joaquin River to one mile beyond the Antioch Bridge.

NOTE – Tug Escort(s) for regulated vessels required in Zones 2, 4 or 6. Standby Tug Escort(s) for regulated vessels required in Zone 1. Tug Escort(s) not required in Zones 3 and 5.

MAP 4

Map produced by Joint California Coastal Commission/BCDC Oil Spill Program

Base Map Source: Map of the North Half of California, Scale 1:500,000, USGS, 1970


Benicia Bridge - CU, CT
Port Chicago - WL, Met, CT
Richmond - WL, CU, Met, CT
Oakland - CU, Met, CT
Alameda - WL
Golden Gate - WL, Met, CT
Redwood City - WL, Met, CT
San Francisco Bay PORTS
Instrument Key:
WL - Water Level (Tide Gauge)
CU - Current Meter
Met - Meteorological Sensors
CT - Conductivity (salinity) & water Temperature

OSPR
Oil Spill Prevention and Response

Comparative Vessel Movement Totals

	2001	2002	Change
Total vessel arrivals	3,144	3,031	-4%
Total vessel interbay shifts	1,450	1,515	4%
Total tanker arrivals	784	757	-4%
Total tanker interbay shifts	859	904	5%

Harbor Safety Committee of the San Francisco Bay Region Clearing House

Fort Mason Center, Bldg. B, Suite 325
San Francisco, CA 94123-1380
Ph. (415) 441-3019 Fax (415) 441-1025

Total Tanker Arrivals for 2002 in the San Francisco Bay Region

Vessel	Flag	Length	Deadweight	Number of Arrivals
ACOAXET	BHS	179	35,608	4
ADYGEJA	LBR	225	61,341	1
AEGEAN TRADER	NIS	170	31,374	1
AKADEMIK SEMENOV	CY	151	17,485	3
ALKAIOS	BHS	225	66,234	1
ALKMAN	BHS	225	18,524	2
ALKYONIS	GR	228	66,895	3
ALLEGIANCE	USA	187	34,397	19
ALLIANCE SPIRIT	BHS	247	97,087	1
ALTAIR	LBR	150	17,553	1
ALTAIR VOYAGER	BHS	259	135,829	1
AMBERMAR	CY	183	35,700	17
ANASAZI	USA	208	39,384	6
ANIARA	LBR	178	40,738	1
ANMAJ	LBR	178	44,772	2
ANTIPOLIS	GR	229	60,525	1
ARAFURA SEA	PA	244	99,500	1
ARCADIA (TTA)	GR	219	62,654	1
ASIA STAR	SGP	158	22,755	4
ASOPOS	LBR	229	63,381	2
ATHOS I	CY	229	60,774	3
BELGRACE	NIS	183	43,534	1
BENE	HR	189	45,467	1
BERTHEA	NIS	213	59,999	2
BERTINA	NO	236	65,979	2

Vessel	Flag	Length	Deadweight	Number of Arrivals
BLUE RIDGE	USA	201	42,268	17
BOW CARDINAL	NIS	183	37,446	1
BOW CEDAR	NIS	184	37,455	1
BOW CENTURY	NIS	183	37,438	1
BOW CLIPPER	NIS	184	37,221	1
BOW FLORA	NIS	183	37,369	1
BOW FORTUNE	NO	171	27,954	1
BOW HERON	NIS	174	35,210	2
BOW LION	NO	171	40,272	1
BOW PEACE	GR	177	45,655	1
BOW PRIDE	GR	177	45,655	1
BOW PRIMA	GR	170	40,092	2
BOW PUMA	GR	171	40,092	1
BOW SKY	NO	171	28,084	2
BRALI	BHS	175	48,450	1
BRO ALEXANDRE	FRA	183	46,801	2
BRO ARTHUR	ATF	183	45,999	1
BT ALASKA	USA	290	191,120	4
BUM DONG	KO	136	17,303	2
BUM JU	KO	135	17,248	4
CAPTAIN H.A.DOWNING	USA	207	39,385	2
CEFALONIA	PA	174	30,484	3
CELTIC TERRIER	GB	142	12,905	1
CHALEUR BAY	ML	229	71,345	1
CHAMPION TRADER	NO	169	30,990	2
CHEMBULK CLIPPER	LBR	156	22,294	1
CHEMBULK ROTTERDAM	LBR	179	28,840	2

Vessel	Flag	Length	Deadweight	Number of Arrivals
CHEMBULK SHANGHAI	PA	136	19,500	1
CHEMBULK SINGAPORE	LBR	132	13,681	1
CHERRY GALAXY	PA	24	18,700	5
CHESHIRE	IOM	166	29,171	2
CHEVRON COLORADO	USA	198	39,842	46
CHEVRON EMPLOYEE PRIDE	BHS	275	156,447	1
CHEVRON MARINER	LBR	261	156,380	1
CHEVRON WASHINGTON	USA	199	39,795	21
CHIMBORAZO	EC	228	66,138	4
COAST RANGE	USA	201	40,631	6
COTOPAXI	EC	228	66,100	3
DA QING 452	CH	193	45,823	1
DARTAGNAN	CY	229	61,762	4
DEMETRA	GR	228	61,361	3
DENALI	USA	290	191,117	8
DILIGENCE	USA	199	39,959	2
DZINTARI	LBR	151	16,344	1
ELEANORA	LBR	219	62,094	1
EMERALD GLORIA	PA	182	41,502	2
EMERALD RAY	PA	227	71,637	2
EMERALD SUN	PA	227	71,675	1
EVROS	LBR	178	39,990	4
FAITH IV	SGP	229	63,765	1
FERTILITY L.	CY	177	39,611	1
FORMOSA EIGHT	LBR	175	35,621	3
FORMOSA ELEVEN	LBR	175	33,200	3
FORMOSA ONE	LBR	177	31,378	1

Vessel	Flag	Length	Deadweight	Number of Arrivals
FORMOSA SEVEN	LBR	167	35,657	2
FORMOSA SIX	LBR	167	35,622	1
FORMOSA TWO	LBR	167	31,300	2
FOSSANGER	NO	171	40,257	1
FOUR GLENS	ITA	194	49,999	1
FOUR SCHOONER	CY	219	72,500	1
FRATERNITY L	GR	176	45,593	1
FRATERNITY L.	GR	177	45,593	2
FREDERICKSBURG	USA	199	40,006	3
FRONT MELODY	LBR	262	150,500	1
FRONT SKY	NIS	275	159,999	1
FUJIGAWA	PA	149	17,845	1
FULMAR	CY	182	39,521	2
GAZ BALTIC	PA	139	11,630	7
GAZ DIAMOND	PA	160	17,577	11
GAZ MASTER	ML	163	15,230	1
GINGA EAGLE	PA	154	19,999	4
GINGA FALCON	PA	153	19,998	2
GINGA KITE	PA	148	18,700	2
GINGA LANNER	PA	148	19,000	1
GOLDEN ELIZABETH	PA	138	15,500	1
GOLDEN NORI	PA	117	11,677	1
GOLDEN TOMO	PA	133	17,427	1
GOLDMAR	CY	228	69,000	4
GRAN ESPERANZA	PA	246	106,684	1
GULF NOMAD	BHS	178	44,803	1
GYDA	NIS	171	31,501	1

Vessel	Flag	Length	Deadweight	Number of Arrivals
HARRIER	LBR	218	60,963	2
HIBIYA PARK	PA	132	13,701	1
HIGH ROD FALK	ITA	183	46,475	1
HMI BRENTON REEF	USA	189	46,500	7
HOBBY	LBR	229	63,910	2
IRINA 2	ML	159	24,593	1
IVER EXACT	NL	182	45,790	1
IVER EXAMPLE	NL	183	45,970	2
IVER EXPERIENCE	NL	174	45,650	3
IVER PRIDE	NL	179	28,840	3
IVER PROSPERITY	LBR	177	30,000	1
JADEMAR	GR	228	69,697	3
JAG PRACHI	IND	182	44,124	1
JAG VAYU	IND	192	28,400	1
JAMES N.SULLIVAN	BHS	259	135,915	1
JO BIRK	NL	175	39,293	1
JO BREVIK	NIS	183	33,490	2
JO LONN	NL	175	39,273	2
JO SELJE	NL	182	36,800	1
JO SYCAMORE	NIS	183	37,622	1
JO SYPRESS	NL	182	36,752	1
KAEDE	JAP	156	21,481	2
KAMOGAWA	PA	149	17,712	4
KANATA SPIRIT	BHS	249	113,022	1
KAPITAN KOROTAEV	CY	151	17,400	2
KAREELA SPIRIT	BHS	249	113,143	1
KEYMAR	CY	242	95,822	1

Vessel	Flag	Length	Deadweight	Number of Arrivals
KINUGAWA	PA	160	24,743	1
KISOGAWA	PA	140	17,739	2
KLIOMAR	CY	242	96,088	1
KOYAGI SPIRIT	LBR	222	95,000	1
KWK ESTEEM	SGP	256	105,342	1
KYEEMA SPIRIT	BHS	253	113,396	1
LEADER	USA	201	38,414	1
LEYTE SPIRIT	BHS	245	98,744	2
LIPETSK	RUS	183	23,876	2
LODESTAR QUEEN	PA	132	13,705	1
LOS ROQUES	ML	220	61,130	2
MAASSLOT L.	GR	172	38,039	1
MAASSTROOM L.	GR	172	38,039	1
MAPLE GALAXY	PA	148	21,860	1
MARE ORIENS	ITA	252	82,513	1
MARGARA	ML	229	60,913	1
MARINE CHEMIST	USA	205	36,526	8
MARINE COLUMBIA	USA	271	124,999	1
MAURANGER	NIS	183	33,695	1
MELODIA	SGP	172	41,450	1
MERCURE	ML	175	29,751	1
MOLDANGER	LBR	180	40,845	1
MOUNT WASHINGTON	USA	225	49,395	1
NAMSAN SPIRIT	BHS	244	10,666	1
NAUTILUS	CY	177	43,538	1
NCC JIZAN	NIS	170	28,025	1
NCC MADINAH	NIS	170	28,060	1

Vessel	Flag	Length	Deadweight	Number of Arrivals
NCC MEKKA	NIS	183	37,272	1
NCC NAJRAN	NIS	171	28,025	1
NCC TIHAMAH	NIS	171	10,152	1
NEAPOLIS	GR	229	60,525	1
NEDIMAR	CY	183	43,999	1
NEW AMITY	LBR	241	106,120	1
NEW CONCORD	MH	175	38,960	1
NEW ENDEAVOR	MH	174	38,985	2
NICOPOLIS	GR	229	60,525	2
ONOZO SPIRIT	BHS	245	100,020	2
ORION VOYAGER	BHS	275	156,447	12
OVERSEAS BOSTON	USA	261	123,692	3
OVERSEAS NEW YORK	USA	273	91,843	4
PACIFIC SOUND	PHL	151	18,591	2
PACIFIC SPIRIT	LBR	244	104,984	1
PALMSTAR CHERRY	BHS	245	100,024	2
PALMSTAR ORCHID	BHS	245	100,047	1
PALMSTAR POPPY	BHS	234	100,031	3
PALMSTAR ROSE	BHS	234	100,202	3
PALMSTAR THISTLE	BHS	245	100,047	2
PANTHER	SGP	172	46,100	1
PEBBLE BEACH	NIS	236	70,637	2
PINK SANDS	ML	242	96,121	2
PLATRES	PA	242	96,121	3
POLAR ALASKA	USA	290	191,459	16
POLAR CALIFORNIA	USA	290	127,003	19
POLAR ENDEAVOUR	USA	273	141,740	3

Vessel	Flag	Length	Deadweight	Number of Arrivals
POLAR RESOLUTION	USA	273	140,320	3
POLAR TEXAS	USA	274	91,393	3
PRINCE WILLIAM SOUND	USA	268	122,941	2
PRODICOS	LBR	192	46,830	1
RAYMOND E.GALVIN	LBR	179	35,596	12
REDINA	BHS	215	60,959	1
RUBYMAR	CY	228	70,000	1
S/R AMERICAN PROGRESS	USA	183	46,095	7
S/R BAYTOWN	USA	238	59,625	19
S/R BENICIA	USA	276	152,298	5
S/R BRISTOL BAY	USA	189	45,671	5
S/R GALENA BAY	USA	201	50,116	14
S/R HINCHINBROOK	USA	273	92,017	4
S/R LONG BEACH	USA	301	214,862	14
S/R PUGET SOUND	USA	201	50,860	11
SAAMIS ADVENTURER	PA	175	30,938	1
SAETTA	ML	228	61,685	1
SAMUEL GINN	BHS	274	156,835	27
SAMUEL L.COBB	USA	187	33,122	3
SANKO HERON	PA	236	61,540	1
SANTA CRUZ I	PA	229	87,325	1
SANTIAGO	EC	182	35,621	2
SCARLET TRADER	PA	163	32,389	2
SEABRIDGE	LBR	241	105,154	1
SEABULK ARCTIC	USA	183	46,094	6
SEABULK PRIDE	USA	183	46,069	4
SEAFALCON	MH	247	97,114	2

Vessel	Flag	Length	Deadweight	Number of Arrivals
SENTOSA SPIRIT	BHS	246	97,159	1
SERAYA SPIRIT	BH	247	97,119	1
SERIFOS	GR	183	46,700	1
SICHEM HOLGER	SGP	107	6,692	2
SICHEM PADUA	SGP	116	9,214	1
SIRIUS VOYAGER	BHS	275	156,382	27
SKIROPOULA	GR	242	68,232	1
SKOWHEGAN	LBR	171	37,314	2
SPRING LEO	PA	139	15,389	6
SPRING LYRA	PA	138	15,200	4
SPRING ORION	PA	139	15,426	3
SPRING URSA	PA	131	15,265	5
SPRING VIRGO	PA	139	15,247	3
ST.CLEMENS	SGP	172	47,131	3
ST.KATHARINEN	HK	182	43,760	6
ST.PETRI (SGP)	SGP	183	47,228	2
STAR OHIO	LBR	274	143,750	1
STAVRONISI	GR	228	68,232	2
STOLT INTEGRITY	LBR	177	30,992	1
SUDONG SPIRIT	BHS	246	86,359	1
SUNNY BLOSSOM	BHS	161	19,995	1
TAIPAN	LBR	156	22,255	1
TANJA JACOB	TU	176	42,606	1
TEAM MARS	NIS	184	42,010	1
TEAM NEPTUN	NIS	182	48,330	2
TEEKAY SPIRIT	BHS	245	100,336	1
TEMASEK	PA	183	39,016	1

Vessel	Flag	Length	Deadweight	Number of Arrivals
TONEGAWA	PA	149	17,722	1
TONSINA	USA	265	124,751	2
TORRES SPIRIT	BHS	241	96,144	1
TRADER	SGP	218	60,961	1
TROMPETEROS	PA	172	25,648	1
TUAPSE	RUS	175	23,876	2
VEGA	MH	186	39,711	2
VIRGO VOYAGER	BHS	274	155,127	2
VIVI	NIS	165	25,300	2
VOLGA	LBR	229	59,998	2
ZANISGRIVA	LBR	151	17,585	1
ZORCA	PA	183	47,165	1
Grand Total				757

VTS San Francisco
Reports of Maritime Incidents 2002

Type of incident	Total
Allision	3
Anchor Dragging	5
Collision	1
Grounding	4
Man Overboard	0
Vessel Casualty	25
Near Miss	1
Rule Nine	3
Obstruction to Navigation	2
VTS Support	8
Total	52

Allision

March 05, 2002
The tug DELTA LINDA was shifting a vessel from San Francisco to the mothball fleet in Anchorage 26. At 1050 her assist tug reported that the ship in tow had struck the Carquinez Bridge, the operator had heard a metal grating sound. The supervisor immediately notified CALTRANS and MSO. Shortly thereafter the pilot on the vessel reported that the ship's mast had struck the center of the navigation span, he was holding station to assess the situation. At noon the VTS received word from the tug company that they intended to turn the vessel around and bring it back to San Francisco. CALTRANS reported no damage to the bridge.

May 31, 2003
VTS overheard a voice on VHF-FM 14 saying that he had lost his engine and was going to collide. No further information was reported. Only one ship was underway in the Central Bay, the M/V Mare Phoencium, departing a berth in the Oakland Inner Harbor. The watch shifted over to the vessel's reported tug working frequency and deduced that the vessel had lost engines and was going to hit Schnitzer's Steel Dock. The watch supervisor immediately informed MSO and Group San Francisco. Using tugs, the pilot was able to slow the momentum of the ship and once the situation was under control informed the VTS that he had scraped paint with a vessel moored at the dock. Shortly thereafter, the vessel regained propulsion; however, the pilot used his tugs to moor the vessel.

December 15, 2002
A severe weather system was taking place causing high wind gusts, heavy rain, and diminished visibility. Pilot on board the M/V Sea Land Patriot outbound for sea was overheard by VTS on channel 10 stating he may have "taken out" Main Ship Channel Buoy 5. VTS called pilot office to confirm the accuracy of what was heard on channel 10. Pilot on board Sea Land Patriot also called to report what happened and said the wind had pushed him onto the buoy while he was slowing to facilitate the boarding of the MT Polar California at the SF Sea Buoy. Sea Land Patriot proceeded back to SF Anchorage 9 to have the hull inspected for further damage. VTS CO and MSO CDO notified, broadcast notice to mariner sent.

Anchor Dragging

February 26, 2002
The tug SEA HAWK with a loaded petroleum barge was anchored in anchorage 5 off the port of Richmond. At 1323 the inshore controller noted that the tug appeared to be dragging. The controller requested that the tug check its

position. After a few moments the operator of the tug stated that he planned to re-anchor the vessel. At 1625 the tug operator reported that he was anchored.

November 07, 2002
In stormy conditions with wind in excess of 25 kts, M/V Tequi was anchored in northeast portion of A9 vicinity of Light #4. During routine calls on 13 and 14 to all anchored vessels, M/V Tequi did not respond. A few minutes later, the M/V Tequi appeared to be dragging anchor, heading NE. VTS contacted Marine Exchange to request a tug and Bar Pilots to call in emergency pilot. Communications with Tequi were hampered by language barrier; Tequi had crossed NAS Alameda channel and was still headed northeast. Eventually, VTS was able to establish VHF communications with Tequi, to confirm their situation. Tequi acknowledged that they were indeed dragging anchor. VTS queried the crewman as to whether both anchors were down; the response did not confirm the status of either anchor. By now, Tequi had drifted into the SE portion of anchorage 8 and their drift rate had slowed significantly to the point where they appeared to be DIW. VTS learned that the emergency pilot would be about 30 minutes to get aboard Tequi. VTS continued to attempt to confirm the status of Tequi's anchors but could not get a status from the vessel. About this time, the vessel appeared to be underway moving in a southerly direction. VTS called the Tequi who responded that they were using engines to shift to their previous anchorage spot. VTS directed the vessel to anchor and await their pilot (three separate times). The vessel then apparent ceased efforts to return to their previous position but then started drifting NE again. Tequi also reported that their Starboard anchor (the one not used) was not working. VTS directed Tequi to use their engine to return to their anchorage. About an hour after the vessel initially started dragging, a pilot boarded the Tequi, intended to transit to A9 and re-anchor. About an hour later, MV Tequi was again anchored in A9 and holding.

November 07, 2002
In severe weather conditions, M/V Handy Islander was anchored in the NE portion of A8. VTS called Handy Islander to check the status of the anchorage; vessel reported still holding and continuing to monitor CH 13 and 14 as is required. Though Handy Islander reported still anchored VTS held the vessel dragging anchor NE. A short while later, Handy Islander called VTS to request a pilot. VTS directed Handy Islander to drop second anchor. VTS called Bar Pilot dispatch to obtain emergency pilot; called MSO CDO. VTS held Handy Islander holding in A8 at this time (with both anchors down). A few minutes later, Unit S checks in with VTS aboard the Handy Islander and reports heaving anchor, intending to re-anchor in deeper water in A8. VTS recommended re-anchoring in A9; pilot concurred. A short while later, the pilot reported Handy Islander re-anchored in A9 with 7 shots; observed winds are about 45 kts. Handy Islander is holding in anchorage.

December 27, 2002
VTS observed MV Ever Deluxe dragging anchor. VTS notified pilots. Pilot dispatched and safely re-anchored vessel.

December 30, 2002. VTS watch observed C/S Ever Develop anchored in the NW corner of anchorage 9 and the C/S Ever Royal anchored on the western edge of anchorage 8 dragging anchor. Winds remained constant from the south at 30 knots. VTS notified pilots and the vessels' agent. Agent ordered two tugs and indicated to VTS he wanted both vessels re-anchored. Pilots dispatched; both vessels safely re-anchored.

Collision

July 24, 2002
Early a.m., Freighter Daio Andes checked in with VTS watch inbound from sea enroute Sacramento, reported visibility was zero NM. Approximately one half hour later, F/V Reliance reports they have been struck and are taking on water. Daio Andes (approximately in same vicinity) contacted but reports no collision. VTS requested Daio Andes to turn around and assist (vessel complies). F/V Reliance calls on CH16 and reports taking on water, requested assistance. VTS makes UMIB on CH16. Group SF informed VTS that 47' launched from STA Bodega Bay to assist Reliance. STA Bodega Bay 47' arrives on scene with Reliance, reports some damage; Reliance has flooding under control. 47' begins escort of Reliance into SF Bay. Visibility at this time is approx ¼ NM in calm seas. Daio Andes is requesting to enter port. VTS works with MSO CDO to gain COTP permission. MSO directed vessel to anchor vice moor as scheduled in order to embark Chemical Team for inspection. Daio Andes took on a pilot and proceeded to anchorage 8 for inspection. Reliance is handed off from 47' to STA Golden Gate escort and proceeds to moor at Pier 45.

Grounding

January 07, 2002
At 1903 VTS received a report from the pilot of the M/T CEFALONIA that he had touched ground off of Hayes Point. The pilot dropped anchor and was awaiting assist tugs from Stockton. At 1905 VTS notified MSO San Francisco of the incident. Twenty minutes later the pilot informed VTS that he planned to wait for the tide to come in and then he would attempt to get the ship underway. Around 1100 the next morning a relief pilot was finally able to free the ship and proceeded on to Stockton.

January 29, 2002
The pilot of the M/V HEINRICH OLDENDORFF reported that his vessel had touched the bank in New York Slough. The pilot was making his approach for a port side mooring at Diablo Services Pittsburgh. As the pilot made his turn near light 5 the ship briefly stopped then came around quickly through the remainder of the turn. MSO was notified and the vessel moored without further incident.

August 13, 2002
MV Royal American, bound from Anchorage 9 to Diablo Services, Pittsburg.

While attempting a port side to mooring, the pilot reported that the vessel was on the bank (grounded) during a port turn in the vicinity of San Joaquin River Light #5. The vessel suffered no apparent damage. VTS worked with MSO CDO to direct pilot to sound tanks to verify hull damage. Vessel moored safely.

November 16, 2002
Master on Tug Betty L reported that he was pushing two flat mud barges; however one was taking on water. Current position was vicinity of light buoy #25 Carquinez Straits, visibility was .3-.5 NM. A short while later, tug master reported that the barge was aground in the mud flats near Benicia and that his company Westar Towing was sending another tug with dewater pumps to the grounded barge. VTS made a broadcast to notify traffic of grounded barge.

December 16, 2002.
Tug Seana C inbound from sea with the loaded oil barge "Energizer" reported their towline had snagged an underwater obstruction NW of Main Ship Channel Buoy 1. Seas reported at 10 ft with winds of 10-15 knots. Seana C reported the tug Sandra Foss is enroute. Seana C reported they may be unhooked from the obstruction but will wait for the Sandra Foss for assistance in retrieving their gear. Ninety minutes later they reported that they were free from the wreck and proceeded inbound.

Man Overboard

Vessel Casualty

January 03, 2002
MT STELLAR GLORY heaving anchor in Anchorage 9 bound for Stockton. Shortly after reporting underway, the pilot informed VTS that he had an engine problem and would be making a wide turn back into anchorage eight. After 30 minutes the pilot reported the problem was a clogged fuel line. The chief engineer cleared the line and the pilot requested permission to get underway. VTS notified MSO San Francisco and the pilot was allowed to proceed to Stockton.

January 23, 2002
The tug BETTY L was transiting from Mare Island to the west span of the Richmond-San Rafael Bridge. At the time of the incident the tug was just south of the Pinole Shoal Channel on a southwesterly heading. At 0405, the tug informed VTS via cellular phone that his vessel had experienced a steering casualty. The tug was twin screwed and the operator felt that he could hold his course using his engines. The operator had contacted his office and an assist tug was underway for his location. At 0619 the BETTY L informed VTS that his assist tug was along side and the engineer had replaced a bad control head in the wheelhouse. The vessel proceeded to Richmond without further incident

February 07, 2002
The MV CSX Producer Outbound for sea. At 0949 the ship was abeam Alcatraz Island when the pilot reported he had a gyro problem and would be proceeding to anchorage. After turning the vessel around, the pilot reports that the radars and gyro would not link up and he would return to Oakland to bring on technicians. At 1128 the ship reported moored in Oakland.

March 10, 2002
The MV McKinney Maersk was outbound from Oakland to Sea. Upon passing North Ship Channel Buoy 2, the pilot reported he was going to make a wide turn to proceed towards anchorage seven. The pilot then informed the VTC that he had a mechanical problem and was attempting to take the ship to anchorage. The pilot dropped anchor just north of North Ship Channel 2 until assist tugs could make up to the vessel. The Marine Exchange dispatched tugs to the ship's location and the vessel was towed into anchorage 7.

April 12, 2002
The MT Polar California was getting underway from the Richmond Long Wharf when the pilot reported that he had lost engine and steering control. Laden with product, the ship was under tug escort in accordance with California State regulations. The watch informed the Marine Exchange who confirmed that the ship had assist tugs alongside. Using three tugs the pilot was able to maintain control of the vessel until some initial repairs are made. Thirty minutes after the initial report the pilot informed VTS that he would transit to Anchorage 9 with limited steering and engine control under tug escort. The vessel anchored without incident.

April 16, 2002
The pilot of the MV P&O Nedlloyd San Francisco ship reported that the ship had lost propulsion shortly after he boarded near the pilot area. Ten minutes later the pilot indicated that the propulsion system had been repaired and requested to proceed into port. The MSO CDO directed the ship to enter port with a tug escort. As the ship neared its berth in Oakland, the VTS watch noticed that the ship appeared to be turned sideways in the channel. The pilot reported to VTS that they had momentarily anchored in the channel due to another engine failure and was proceeding to Berth 60 with the assistance of tugs. A Captain of the Port Hold was placed on the vessel.

April 29, 2002
The MV Gretke Oldendorff had just gotten underway from Richmond when the pilot reported that he planned to anchor in either anchorage 5 or 7 to fix a problem with the engine. A fuel line had broken, however, it did not affect the maneuvering capabilities of the ship and could be quickly repaired. The ship anchored, conducted repairs, and was allowed to proceed out to sea.

May 11, 2002
The MV Santa Monica was backing away from Oakland berth 23 when a fuel line break caused the vessel to lose propulsion. The pilot immediately dropped

anchor and was using tugs to keep the vessel lined up in the channel while the ship's engineer made repairs to the system. Five minutes later the line was replaced and MSO authorized the ship to proceed to sea.

May 25, 2002
As the MV General Tirona was maneuvering to receive their pilot, the VTS watch overhead the master inform the pilot boat that due to a leak in the hydraulic line they were having steering problems; estimated repairs in three minutes. The pilot boat informed the master of the vessel that the pilot would not board until repairs were completed. VTS briefed the MSO CDO and requested to know if any restrictions would be placed on the vessel's transit. The MSO CDO stated that the vessel could proceed to anchorage once repairs were complete and would require a class society inspection prior to any move within the Bay. The pilot boarded and the vessel proceeded to anchorage eight without further incident.

July 03, 2002
The pilot of the MV Tai Hua Hai reported a loss of the main engine while transiting downbound in the Stockton Deep Water Ship Channel. Shortly after, the pilot reported regaining the vessel's engine, but subsequently lost steering control. Because another vessel was scheduled to depart Stockton, the vessel was directed to proceed downriver to New York Point on a slow bell and that an escort tug (already enroute) would be required. At New York Point, an additional escort tug was ordered and the vessel was directed to proceed to Anchorage 9 with a two-tug escort.

July 15, 2002
The pilot on the M/V Nassau Paradise reported intermittent loss of engines while mooring portside to, Schnitzers Steel berth in Oakland Harbor. Two tugs held alongside while attempts made to restart engines. Cause of engine loss determined to be air control problem. Repairs were effected and vessel moored without further incident.

August 03, 2002
M/V Akademik Semenov bound for Stockton lost power and steering vicinity of Stockton #3. The pilot used the ships anchor to maintain position in channel. Vessel lost port anchor and dropped starboard anchor. VTS contacted MSO and Bar Pilots. Tugs underway from Stockton to assist; the pilot turned the vessel around and began heading downbound towards Pittsburg. At Prisoners Point, two additional tugs arrived on scene. The tugs proved insufficient to tow vessel to original destination so the pilot decided to moor the vessel at Diablo, Pittsburg. Stockton channel was closed due to anchor possibly fouling channel. VTS worked with MSO to document last known position of anchor.

August 09, 2002
MV Sichem Holger from sea inbound for Anchorage 9, approximately 4nm southwest of the Sea Buoy when they reported that they were stopping for approx 10 min to check a start valve problem. The MV Seabulk Artic was outbound near Main Ship Channel buoys 1 and 2 and the NYK Springtide was inbound in the southern traffic lane. VTS watch facilitated communications to ensure passing arrangements were made between the three vessels. Seabulk Arctic passed clear of Sichem Holger to the north and NYK Springtide passed clear of Sichem Holger to the east. Sichem Holger subsequently got back underway with a pilot onboard and proceeded inbound.

August 21, 2002
The pilot aboard the MV Mirande checked in at US Steel (Posco), Pittsburg. Shortly after getting underway, the pilot reported engine problems and proceeded back to mooring. Engine casualty was fuel flow problem to two cylinders. MSO CDO notified. Vessel moored safely with tug assist.

September 01, 2002
The MT Jo Brevik was inbound for the Richmond Long Wharf; visibility was approx ¼ nm in fog in the approaches to the Golden Gate and clear east of the bridge. The pilot reported a casualty to the 3cm radar, and was awaiting COTP permission to enter on single (10cm) radar with ARPA, which were operating properly. VTS contacted MSO CDO who indicated that a letter of deviation from the vessels agent was required. Vessel turned outbound awaiting LOD. VTS received copy of LOD from MSO, vessel allowed to enter port. Vessel completed its transit without further incident.

October 17, 2002
The MT Santa Cruz I, was underway from anchorage 9 to Valero. Vessel was in the North Ship Channel when the pilot reported engine problems and that he intended to turn south and proceed to Anchorage 7. The tug Andrew Foss was already on scene as escort. Casualty was to the electric aux turbocharger, ETR unknown. The vessel later anchored in A7.

November 25, 2002
Tug Alan G with three barges in tow inbound off the San Francisco city front en route Pier 3 via Anchorage 7 to shorten tow. While in A7, Tug Alan G reported that two barges had broken loose and that the third barge still in tow had flooded by the stern and was bow up. VTS learned that the Westar Tug Rivercat would take the two drifting barges in tow. VTS advised the Alan G to try to remain in A7 with the flooded barge in an attempt to stay of the channel. VTS passed all pertinent info to MSO CDO. Rivercat took the two drifting barges in tow and departed A7 en route Pier 3. The Alan G had drifted into the channel but confirmed that the flooded barge, though bow up, is stable but no line was attached to barge's stern. VTS advised the pilot of the M/V APL Sweden,

inbound for Berth 62; the pilot changed his Bay Bridge span intentions from D-E to A-B to give the Alan G. a wider berth. VTS then worked with Pacific Tugboat Services to coordinate plan for refloating the partially sunken barge. Through the efforts of divers and a crane barge, the flooded barge was re-floated later that evening, and secured at Pier 3.

December 10, 2002
The MV Seven Seas inbound from sea bound for pier 70 drydock. The pilot reported a fire onboard; crew responding. Recommended VTS contact SF Fireboat as precautionary measure. VTS contacted MSO CDO, GRU SF then SF Fire Dispatcher to request Fireboat as safety measure. The pilot reported the smoke had cleared; source of fire un-located. SF Fire Dispatch directs Fireboat Phoenix to scene. The pilot reports that there never was a real fire, cause of smoke was oil dripping on A/C fan unit. VTS worked with MSO and GRU to have Phoenix standown.

December 24, 2002
Pilot on board the M/V Southgate passing Pinole Point in the San Pablo Bay for sea reported having lost all power and his rudder. Pilot on board the Sound Reliance ahead of the Southgate also outbound for sea sent his escort tug, the Delta Carrie to assist. Four minutes later the vessels' power and rudder was back on line and the Delta Carrie was sent back to the Sound Reliance. Tug Avenger arrived to standby the vessel for the duration of the transit. MSO CDO notified and gave clearance for the vessel to proceed outbound. (IR-048-02)

December 24, 2002
Pilot aboard M/T Iver Pride docking at Selby reported one of her assist tugs, the Sagittarian, had an engine failure while docking the vessel. Pilot anchored vessel off the Selby dock awaiting another assist tug. Tug Terilyn towed the Sagittarian to Mare Island. Tug Brynn Foss remained on scene with the Iver Pride, tug Sea River Mare Island enroute. S/R Mare Island and Brynn Foss safely secured the Iver Pride at Selby.

December 27, 2002
NOAA Vessel Nancy Foster, inbound from sea for SF Pier 30 reported lost her engines just west of Blossom Rock, and may need to anchor. VTS inquired if assistance was needed, the vessel declined. VTS conducted a securite broadcast and notified nearby vessels. Six minutes later the vessel's engines were back on line and safely completed their transit.

Near Miss

December 02, 2002
The MV Pu He from sea bound for Berth 57; tug Terry Brusco with tow from alongside a dredge near Berth 37 bound for disposal site 11. Upon checking in with VTS, the tug Terry Brusco was advised of the MV Pu He and a traffic turnaround report was provided to the pilot of the MV Pu He. The pilot of the MV Pu He was then unable to establish comms with the Terry Brusco. When Terry Brusco checked in with first position report, VTS relayed the pilot's concern that they remain clear of channel. The pilot contacted Terry Brusco to advise that he was at Blossom rock; Tug responded that he was in the outer harbor and would stand by in order to pass astern of M/V Pu He. VTS confirmed with Terry Brusco that their intentions were to remain clear. However, the pilot informed the Terry Brusco that they were still in the way. The pilot reported to VTS that it appeared that M/V Pu He would just clear Terry Brusco in the channel. VTS observed on camera and radar that M/V Pu He had safely cleared the tug.

Rule Nine

January 06, 2002
The MV TOKYO EXPRESS, transiting from sea to Oakland via the eastbound traffic lane. At 1640 the watch overheard the pilot attempting to contact an excursion vessel on channel 13. The vessel did not respond. The pilot reported to VTS that the vessel had crossed his bow and was in violation of Rule 9. The pilot stated that he had sounded five short blasts, came to dead slow, and just avoided the vessel. VTS notified MSO of the rule 9 complaint.

February 03, 2002
The pilot of the MV Buyihe contacted the VTS to inquire if the watch had heard her sound the danger signal. The watch had not. The pilot reported that she had had a close aboard situation with a sailing vessel that caused her to change course in order to avoid a collision. Both the pilot and her assist tug sounded the danger signal with no response from the sailing vessel. The watch supervisor forwarded the report to the MSO.

December 11, 2002
The M/V Wan Hai outbound passing Main Ship channel buoys 1 and 2 for sea with Sea Marshal Team India Oscar onboard. The pilot reported a Rule 9 violation, close aboard situation with Fishing Vessel Shadow. Sea Marshal team reported that the pilot had sounded ship's whistle and had to make an evasive turn to avoid collision with the F/V Shadow. VTS did not hear any radio calls by the pilot or M/V Wan Hai. VTS was not able to observe any small contacts in the vicinity of the Wan Hai at the time of the report. After subsequently detecting a small contact inbound, VTS hailed F/V Shadow who finally answered on CH12.

Vessel acknowledged that they could've been the vessel in question. The Master admitted that he was not on the bridge at the time the pilot's report.

Obstruction to Navigation

July 17, 2002
The pilot on the M/V MARY H, upbound from sea to Stockton, notified VTS that UPRRB has malfunction and is stuck in down position. The pilot slowed the vessel to avoid having to anchor. A tug was soon enroute to assist MARY H. Approximately one half hour after first report, UPRRB operator reports ETR for bridge is unknown. The pilot then decided to anchor in A23 with assist from Marauder. Approximately two and half hours after initial report, UPRRB operator reports bridge back in working order. MARY H gets underway and proceeds under UPRRB enroute Stockton without further incident.

October 22, 2002
Tug Laguna pushing a crane barge upbound for Montezuma Slough; the Chevron Washington upbound to Shore Terminals Martinez. Approximately mid-afternoon, UPRRB Operator reported to Tug Laguna on CH13 that bridge was unable to lift ETR 10 minutes. Two minutes later, Bridge operators reported to Tug Laguna that bridge was inoperable due to a switch casualty. Tug Laguna revised sailing plan, intended to anchor in A22. VTS notified D11 Bridge Section; also notified the pilot on the Chevron Washington who immediately requested permission to anchor in A23 if needed. VTS facilitated communications between the UPRRB Operator, the vessels, the Bar Pilots, the Marine Exchange as well as D11 Bridge Section. Tug Laguna and Chevron Washington ended up anchoring in Anchorages 22 and 23 respectively. Approximately one and a half hours following the initial casualty, the UPRRB Operator reported that the bridge was operational. Both vessels proceeded under the bridge without further delay.

VTS Support

April 10, 2002
VTS received a report from the MT Seraya Spirit that they were planning to turn around and anchor offshore due to a medical emergency. The watch directed the ship to anchor in a position 6 nautical miles north of the San Francisco Sea buoy while the watch supervisor briefed Group San Francisco. The ship's agent contacted the VTS to get an updated location of the ship. She informed the supervisor that a plate had fallen on the 3rd mate. The supervisor directed the agent to contact the MSO CDO with this information. The ship anchored about an hour later and the mate was air lifted via a CG HH-65 to a local hospital.

April 22, 2002
The offshore operator received a report from the inbound MV Virginia that their Chief Engineer was unconscious and needed medical attention. The watch supervisor briefed Group San Francisco. Group contacted the vessel and

informed them a rescue helicopter was enroute. The Chief Engineer was air lifted to Stanford Medical Center.

July 05, 2002
The pilot onboard the M/V New Horizon upbound for Pittsburg alerted VTS watch of unknown tug pushing derrick barge ahead, downbound near Port Chicago. VTS had no tug/barge checked in in that area and hailed the tug on 14. The tug CALIFORNIA responded; the master indicated that he was not aware of requirement to check in with VTS as a user. Tug directed to establish communications on CH 14. Unable to establish VHF comms, watch sup calls Station Carquinez to request a boarding of the tug. MSO CDO also informed. CG 41' WTB eventually boards Tug CALIFORNIA; master eventually calls in a Sailing Plan report to VTS on CH14. Group San Francisco subsequently terminated the tug's voyage for unsafe conditions: no navigation lights.

July 07, 2002
Southend Rowing Club permitted for marine event, 9 swimmers from St Francis Yacht Club to Alcatraz. Southend Zodiak reported 2 swimmers unaccounted for. VTS Watch advised Zodiak to contact GRU SF for assistance. Ferry ROYAL STAR offered to assist with search. VTS watch contacted GRU SF advised of missing swimmers and to expect contact by Southend Zodiak. About 40 minutes later, Southend Zodiak confirms that 2 swimmers were located ashore.

October 16, 2002
VTS Watch noticed small vessel anchored vicinity of Pier 40 approx ½ nm from pier in the channel. VTS notified Group SF and indicated that the vessel was anchored in the channel and not lighted, and therefore could pose a navigation hazard to a container ship bound for anchorage 9. VTS notified the pilot aboard the MV Wehr Flottbek of the anchored vessel. The pilot then amended his Bay Bridge intentions from A-B to B-C. VTS assisted Station SF UTB in locating unknown vessel using cameras. 41' UTB determined sailing vessel to be disabled and towed it to South Beach Harbor.

October 17, 2002
The pilot onboard the MV Star Gran anchored the vessel in A9 with 6 shots. VTS worked with pilot to determine distance between Star Gran and Norassia Sharjah anchored to the west. VTS determined distance to be .3nm. VTS directed vessel to reposition; Star Gran re-anchored approx.65nm from nearest vessel.

October 17, 2002
The pilot on the MV Norassia Hamburg anchored the vessel in A9. VTS determined range to closest vessel to be .25nm. Worked with Unit 37 to reposition; vessel re-anchored in A9 approx .38 from closest vessel.

November 07, 2002

In severe weather conditions for the area, with winds approx 40kts sustained, the Tug Seariver Carquinez reported a dry dock from Pier 70 had broken loose and was underway, adrift in the vicinity of Pier 48. Tug Seariver Carquinez was going to attempt to gain control of the dry dock. VTS was able to acquire the dry dock on radar and established a track heading northeast at approximately 6 kts towards the Oakland Bay Bridge. VTS called Group SF and the Marine Exchange to gather more tug resources to assist Seariver Carquinez. VTS also made a Securite broadcast to alert all mariners in the area and request assistance from any available tugs in the area. Tug Brynn Foss and Tug Sharon Brusco offered assistance with the dry dock. The Dry dock was still headed NE towards the Bay Bridge; VTS called CalTrans dispatcher to advise them of the situation and to see who needed to be contacted in case the bridge needed to be shut down. At this time, Tug Brynn Foss was headed for the dry dock; Tug/tow American River intending the D-E span had to alter course to the west to avoid colliding with the dry dock. VTS continued to track the dry dock, which was moving ENE until radar contact was lost under the YBI radar shadow zone. A short while later, Tug Brynn Foss reported the dry dock aground on the south end of YBI apparently stopped and the three tugs kept it off the bridge. The tugs could not get alongside the dry dock due to water depth but were remaining in area as a watch. VTS continued to work with Cal Trans to develop a contingency for closing the bridge if necessary; Cal Trans would require 15 minutes notice. Tugs on scene with the dry dock at this time are: Brynn Foss, Sharon Brusco, with Andrew Foss en route. VTS briefed CGC ASPEN ODD, with ASPEN about 50 yards away from the dry dock. A representative from the Port of San Francisco called and claimed ownership of the dry dock. VTS worked with MSO CDO to develop plan for who should take lead in coordinating efforts to secure dry dock. Tugs Brynn Foss, Andrew Foss and Sharon Brusco remained on scene. High tide of plus 6 ft was to occur at 0300. MSO to take lead in coordinating efforts with dry dock.

Certified Escort Boat as of September 17, 2003

Tug Boat ID	Tug Name	Zones 1 & 2	Zones 4 & 6	Certification Expires
ANAV	AVENGER	28.32	28.32	03/22/04
ANEN	ENTERPRISE	59.81	59.81	10/27/03
ANKA	KELLEY ANNE	12.52	12.52	03/22/04
ANLM	LYNN MARIE	155.99	155.99	10/15/04
ANPC	PACIFIC COMBI	67.90	67.90	09/17/05
ANTI	TITAN	35.56	35.56	03/22/04
BDCA	DELTA CAREY	188.00	171.00	02/28/04
BDDD	DELTA DEANNA	188.00	171.00	04/25/05
BDLA	DELTA LINDA	188.00	171.00	04/25/05
FMAF	ANDREW FOSS	188.00	153.00	09/27/03
FMAM	AMERICAN RIVER	21.83	21.83	09/04/06
FMAN	ANNA FOSS	20.27	20.27	09/08/06
FMAR	ARTHUR FOSS	188.00	153.00	12/02/05
FMBF	BRYNN FOSS	140.00	134.00	09/08/06
FMCF	CLAUDIA FOSS	27.18	27.18	11/30/03
FMDE	DEAN FOSS	15.89	15.89	09/04/06
FMDF	DANIEL FOSS	74.65	74.65	02/07/06
FMKF	KEEGAN FOSS	71.98	71.98	09/08/06
FMMT	MARIN TWILIGHT	20.88	20.88	09/04/06
FMRF	RICHARD FOSS	47.45	47.45	12/02/05
FMRM	RICHARD M	35.56	35.56	03/13/05
ONAE	AMERICAN EAGLE	56.70	56.70	04/24/06
ONSE	SEA EAGLE	26.59	26.59	12/11/03
SRCA	S/R CALIFORNIA	170.00	150.00	12/13/03
SRCQ	S/R CARQUINEZ	64.28	64.28	12/13/03
SRMI	S/R MARE ISLAND	188.00	171.00	01/22/04
STCF	C.F. CAMPBELL	59.13	59.13	01/09/06
STEC	ERNEST CAMPBELL	53.60	53.60	06/10/06
STMF	MILLENNIUM	115.44	115.44	01/09/06
STRM	ROYAL MELBOURNE	38.72	38.72	08/21/05
STZ3	Z-THREE	100.83	100.83	09/05/06
STZ4	Z-FOUR	103.18	103.18	09/05/06
STZ5	Z-FIVE	103.90	103.90	09/05/06
SWPO	POLARIS	18.34	18.34	05/01/06
SWSU	MARIN SUNSHINE	33.27	33.27	05/01/06
SWVE	VEGA	49.85	49.85	03/27/05
WSAP	APOLLO	29.04	29.04	07/30/06
WSBC	BEARCAT	13.61	13.61	12/05/03
WSBL	BETTY L.	13.12	13.12	12/06/03
WSBY	BAYCAT	10.09	10.09	11/03/05
WSFC	FATCAT	11.75	11.75	11/03/05
WSKT	KITSAP	15.25	15.25	12/06/03
WSOR	ORION	49.97	49.97	12/29/03
WSRC	RIVERCAT	14.65	14.65	11/03/05
WSSA	SAGITTARIAN	45.11	45.11	12/06/04
WSSO	SOLANA	26.80	26.80	12/05/03
WSTL	TERILYN	21.16	21.16	11/03/05
WSWC	WILDCAT	15.17	15.17	12/06/03

San Francisco Bay Clearinghouse Report For 2002

San Francisco Bay Region Totals

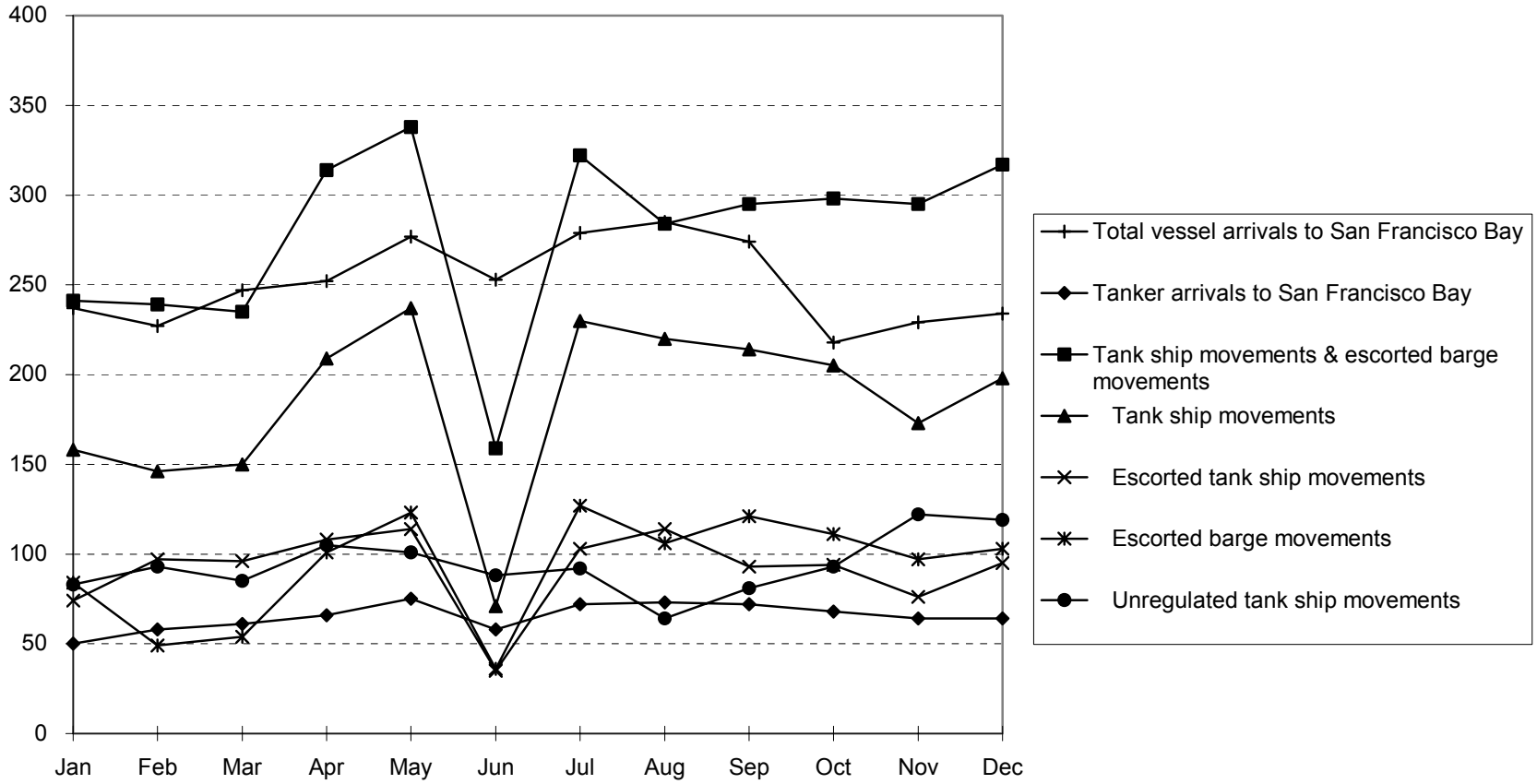
			2001
Tanker arrivals to San Francisco Bay	781		710
Tank ship movements & escorted barge movements	3,337		3,501
Tank ship movements	2,211	66.26%	2,376
Escorted tank ship movements	1,099	32.93%	1,110
Unescorted tank ship movements	1,112	33.32%	1,266
Tank barge movements	1,126	33.74%	1,125
Escorted tank barge movements	610	18.28%	609
Unescorted tank barge movements	516	15.46%	516
Percentages above are percent of total tank ship movements & escorted barge movements for each item.			
Escorts reported to OSPR	2		6

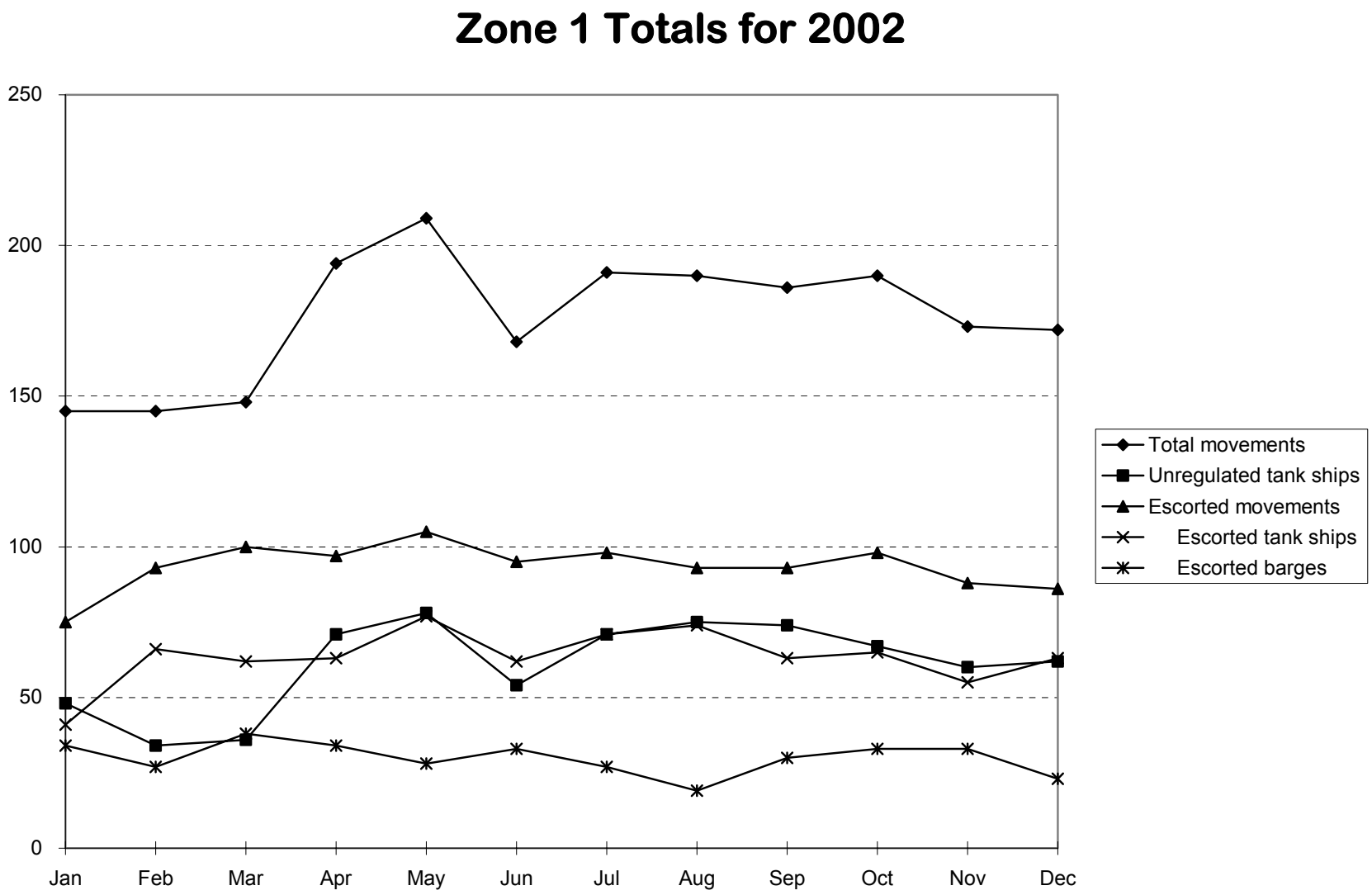
Movements by Zone	Zone 1	%	Zone 2	%	Zone 4	%	Zone 6	%	Total	%
Total movements	2,111		3,245		0		1,709		7,065	
Unescorted movements	990	46.90%	1,600	49.31%	0	0.00%	808	47.28%	3,398	48.10%
Tank ships	730	34.58%	1,142	35.19%	0	0.00%	525	30.72%	2,397	33.93%
Tank barges	260	12.32%	458	14.11%	0	0.00%	283	16.56%	1,001	14.17%
Escorted movements	1,121	53.10%	1,645	50.69%	0	0.00%	901	52.72%	3,667	51.90%
Tank ships	762	36.10%	1,091	33.62%	0	0.00%	549	32.12%	2,402	34.00%
Tank barges	359	17.01%	554	17.07%	0	0.00%	352	20.60%	1,265	17.91%

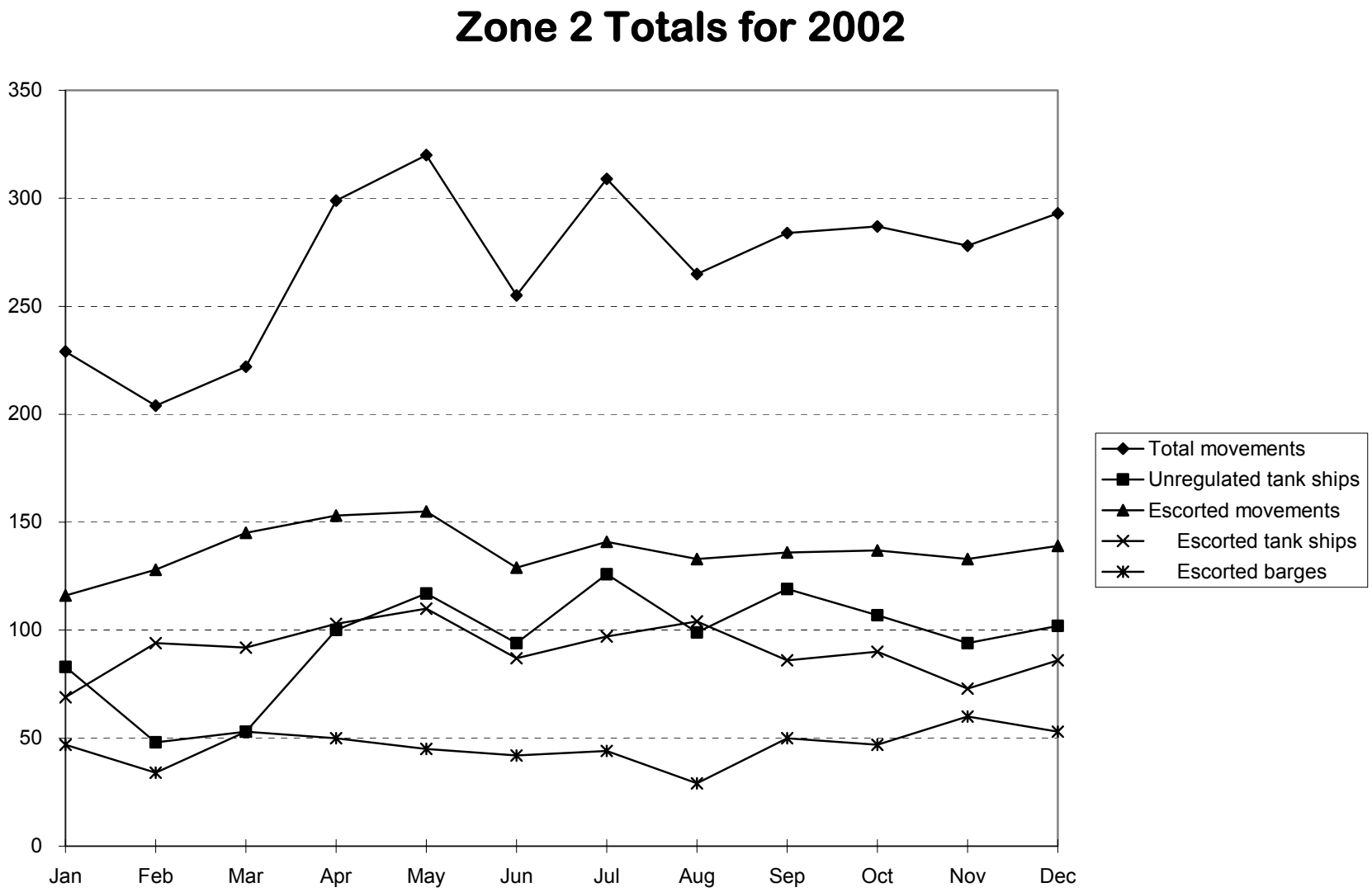
Notes:

1. Information is only noted for zones where escorts are required.
2. All percentages are percent of total movements for the zone.
3. Every movement is counted in each zone transited during the movement.
4. Total movements is the total of all unescorted movements and all escorted movements.

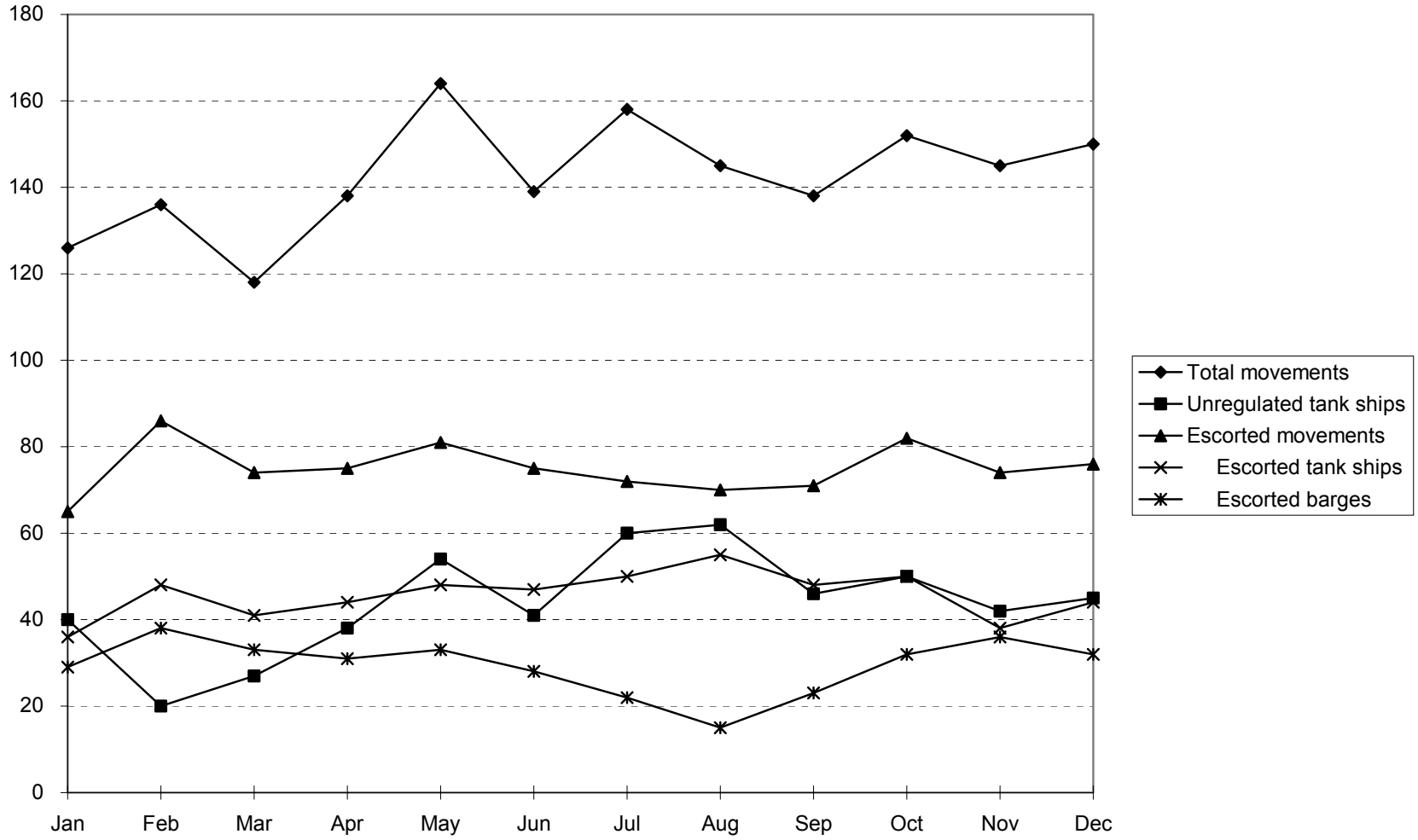
Total Escort Movements in San Francisco Bay for 2002




Zone 1 Totals for 2002
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Total movements
Unregulated tank ships
Escorted movements
Escorted tank ships
Escorted barges


Zone 2 Totals for 2002
350
300
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Total movements
Unregulated tank ships
Escorted movements
Escorted tank ships
Escorted barges

Zone 6 Totals for 2002



TITLE 14, CALIFORNIA CODE OF REGULATIONS
SUBDIVISION 4. OFFICE OF SPILL PREVENTION AND RESPONSE
CHAPTER 4. VESSEL REQUIREMENTS
SUBCHAPTER 1. TANK VESSEL ESCORT REGULATIONS FOR THE SAN FRANCISCO BAY REGION
SECTIONS 851.1 through 851.10.1
Amended July 18, 2001
Effective October 4, 2001

"851.1 Effective Date of this Subchapter"

This subchapter, as amended, shall be effective on October 4, 2001.

Note: Authority: Sections 8670.17.2(a), and 8670.23.1(d), Government Code.
Reference: Sections 8670.17.2(b), 8670.23.1 (d), (e)(1) and (h) Government Code.

"851.2 Purpose and Scope"

This subchapter sets forth tank vessel escort requirements for the San Francisco, San Pablo and Suisun Bays. These requirements specify that tank vessels carrying 5,000 or more long tons of oil in bulk as cargo shall be escorted by a suitable escort tug or tugs. The escort tugs will be available, and shall respond as needed to influence the speed and direction of travel of the tank vessel in the event of a casualty, or steering or propulsion failure, thereby reducing the possibility of groundings or collisions and the risk of oil spills from these tank vessels. This subchapter establishes the criteria for matching tugs to tankers and barges. Tankers will be matched according to a matrix that correlates a tanker's displacement with the braking force of a tug(s). Barges must be matched based on a one-to-one correlation of the deadweight tonnage of the barge to the braking force of the tug(s).

The Administrator shall review the matching criteria and other program elements within two years of the effective date of this subchapter. The program review will include a survey of the tanker-related incidents in U.S. waters to determine the type*s* of failures that have occurred, an assessment of tug technology and any advances made in design and power, and the tug escort-related rules and policies that are implemented by other coastal states and maritime organizations. At the conclusion of the review, the Administrator will determine whether it is necessary to modify the tug/tanker matching criteria or any other provision of the program requirements.

Note: Authority: Sections 8670.17.2(a) & 8670.23.1(d), Government Code.
Reference: Sections 8670.17.2(b) and 8670.23.1(e)(1), Government Code.

"851.3 Definitions"

Definitions governing the construction of this subchapter can be found in Government Code Section 8670.3, and Chapter 1 of this subdivision.

Note: Authority: Sections 8670.3, 8670.17.2(a) and 8670.23.1(d), Government Code.

Reference: Section 8670.3 and 8670.17.2(a), Government Code.

"851.4 Applicability"

(a) This subchapter shall apply to all tank vessels capable of carrying 5,000 or more long tons of oil in bulk as cargo when these vessels are underway on waters in the San Francisco, San Pablo and Suisun Bays, as follows:

(1) tank vessels carrying 5,000 or more long tons of oil as cargo shall be required to comply with all the requirements in this subchapter;

(1) tank vessels carrying less than 5,000 long tons of oil as cargo shall only be required to comply with the reporting requirement as stated in Subsection 851.7

(b) The escort requirements of this subchapter shall not apply to tank vessels that are only shifting location within an anchorage. Any tug used during such a shifting maneuver need not be an escort tug registered with the Clearing House.

(c) This subchapter shall not apply to tank vessels otherwise covered by the requirements of this subchapter in the event of an emergency. The master of the tank vessel shall report to the Clearing House any deviation from the requirements outlined in this subchapter as soon as practicable, and in no case later than the departure of the tank vessel from the marine waters of the state. For purposes of this section, an emergency shall include, but not be limited to, any of the following:

(1) imminent and immediate danger to the vessel, its cargo, or its crew; or

(2) imminent and immediate danger to a marine terminal, or to the escort tug; or

(3) imminent and immediate danger to a vessel in close proximity to the tank vessel; or

(4) any emergency declared by the Captain of the Port.

(d) This subchapter <u>(except for this Subsection 851.4(d))</u> shall not apply to tankers with double hulls, as that term is defined in 33 CFR 157.03(kk), when the tanker also has <u>the following:</u>

<u>(1) Fully redundant steering and propulsion systems to include:</u>

<u>(A) two independent propulsion systems each with a dedicated propeller, engine (or motor), electrical generation system, electrical system (including the switchboard), fuel system, lube oil system, and any other system required to provide the vessel with independent means of propulsion; and</u>

<u>(B) two independent rudders each with separate steering systems; and</u>

<u>(C) the propulsion and steering components, as described in Subsection (A) and (B) above, shall be arranged in separate spaces, such that a fire or flood in one space will not affect the equivalent system in the other space(s); and</u>

(D) a bow thruster with an assigned power source;

(2) A Navigation System in compliance with the federal navigational equipment requirements set forth in 33 CFR Sections 164.35, 164.37, 164.38(b), 164.40, 164.41, 164.42, and 164.43.

(3) No exemption to this subchapter shall be allowed for a tanker requesting a U.S. Coast Guard Captain of the Port letter of deviation, pursuant to 33 CFR Sections 164.51, 164.53, and 164.55.

(4) The Administrator may require tankers that are exempt from this subchapter under the conditions outlined in Subsection (d) to periodically demonstrate the tanker and crew's ability to maneuver in response to a partial or total loss of propulsion and/or steering at a level of safety at least equal to that of an escorted tanker.

(e) This subchapter shall apply to all tugs being used to escort tank vessels in waters identified as escort zones.

(f) The tank vessel master remains responsible for the safe navigation and maneuvering of the vessel in all circumstances. The requirements outlined in this section are in addition to, and not a limitation of, any other responsibility created by custom, law, or regulation.

Note: Authority: Sections 8670.17.2(a) and 8670.23.1(d), Government Code.
Reference: Section 8670.23.1(e)(1), Government Code, and
33 USC 2002(b) and 2007, and 33 CFR 157.03(kk).

"851.5 Escort Zone Requirements"

(a) Six tank vessel escort zones are established as follows:

(1)Zone 1: All waters in the area encompassed by a straight line drawn between Point Bonita Light, through Mile Rocks Light to the shore (the COLREGS Demarcation Line), and eastward to the Golden Gate Bridge;

(2)Zone 2: All waters from the Golden Gate Bridge, south to a line drawn between the southern tip of Bay Farm Island and the southeastern tip of Point San Bruno Peninsula, and north to a line drawn from Point San Pablo to San Pablo Bay Light 4 (Light List number 5880), to San Pablo Bay Channel Light 5 (Light List number 5885), to Point San Pedro;

(3)Zone 3: All waters from the southern end of Zone 2 to one mile north of the San Mateo Bridge;

(4)Zone 4: All waters in the navigable channel from one mile north of and to one mile south of the San Mateo Bridge;

(5)Zone 5: All waters from the eastern boundary of Zone 2 to the western approaches of the Carquinez Bridges at Light 15;

(6)Zone 6: All waters from Light 15, through the Carquinez Strait, north on the Sacramento Ship

Channel to one mile beyond the Ryer Island Ferry Terminal and east on the San Joaquin River to one mile beyond the Antioch Bridge;

(b)Tank vessels required to have escorts under this subchapter shall be escorted in the zones as specified below:

(1) Escort tugs are required for tank vessels operating within Zones 1, 2, 4, or 6;

(2) Escort tugs will not be required in Zones 3 or 5, or in areas outside of Zones 1 through 6;

(3) No tank vessel may transit in a zone that requires an escort tug unless escorted by a tug or tugs of sufficient size and capability, as specified in sections 851.9 (for tankers) and 851.9.1 (for barges).

(4) In Zone 1, escort tugs shall be stationed as follows:

(A) on an inbound transit, the escort tug shall be in Zone 1 prior to the tank vessel's arrival to the area bounded by an arc eight nautical miles seaward of and centered on Mile Rocks Light; and

(B) on an outbound transit, the escort tug shall remain in Zone 1 until the tank vessel leaves the area bounded by an arc eight nautical miles seaward of and centered on Mile Rocks Light.

Note: Authority: Sections 8670.17.2(a) and 8670.23.1(d), Government Code.
Reference: Section 8670.17.2(a), Government Code

"851.5.1 Escort Plans"

(a) All tank vessel masters shall use an Escort Plan for transits through zones 1, 2, 4, or 6. The tank vessel shall not continue or commence a transit through any Escort Zone without an Escort Plan that is complete and adequate. The plan shall document the steps that the tank vessel owner/operator and/or master will take to comply with the requirements of this subchapter. The Escort Plan requirements set forth in this section are only planning standards and may not reflect the exigencies of an actual incident response. However, the Escort Plan must demonstrate that the vessel master is prepared to take the actions necessary to assure a reasonable level of success in providing the protection intended by this subchapter, as stated in section 851.2. The Escort Plan shall include:

(1) the tank vessel's intended route(s);

(2) the intended transit speed(s);

(3) a communication plan, to include the radio frequencies that will be used and any other means of electronic communication;

(4) the following characteristics of the tank vessel:

(A) the location and strength of the bitts and chocks to be used by the escort tugs,

(B) the location of the pushing surfaces on the hull that are strong enough to sustain the forces that can be exerted by the escort tug(s),

(C) the number of crew assigned to escort-related duties,

(D) any pertinent performance characteristics and related limitations of the steering and propulsion system(s);

(5) the escort tugs to be used during the transit as required in section 851.9 (for tankers) or 851.9.1 (for barges);

(6) the response actions that will most likely be implemented in the event of an emergency, taking into account the available bitts and chocks, pushing surfaces, line type, and expected tides and currents.

(b) Escort Plans shall be prepared using one of the following:

(1) a format as designed, completed and submitted by the tank vessel owner/operator; or

(2) a Checklist as recommended by the Harbor Safety Committee of the San Francisco Bay region, and approved by the Administrator. The vessel owner/operator shall assure that the vessel master completes the Checklist according to the requirements in this subchapter.

(c) Review, approval and use of an Escort Plan designed and submitted by the tank vessel owner/operator:

(1) a tank vessel owner/operator may develop an Escort Plan for a vessel or vessels, and submit that plan to the Administrator for review and approval prior to using the plan for escorted transits;

(2) the Escort Plan developed by the vessel owner/operator shall include all the information required in subsection 851.5.1(a). The requirement for information regarding the tug(s) to be used during the transit may be met by stating the size and braking force capacity of the tug(s) needed for each of the vessels covered by the plan.

(3) each plan shall be either approved, approved with conditions, or denied within 60 days after the Administrator receives the plan. Approval, once given, may be revoked if it is found that the plan submitter is not complying with the requirements of this subchapter;

(A) to be approved, the plan must comply with the requirements in this section, must match tug(s) to the tank vessels in accordance with the requirements in this subchapter, and must demonstrate that the tank vessel owner/operator and/or master maintains a level of readiness that will allow for effective implementation of the plan. The plan submitter shall be notified in writing when a plan has been approved.

(B) approval shall be denied or revoked if the plan, or the implementation of the plan, does not comply with the requirements of this subchapter. If a plan is denied or

revoked, the Administrator shall notify the owner/operator in writing of the reasons for denial or revocation, and provide an explanation of those actions necessary to secure approval. The Checklist form of escort plan, as prescribed in this section, shall be used unless and until a new or revised escort plan is submitted and approved by the Administrator.

(4) once approved, the master and pilot shall use and comply with the Escort Plan on each escorted transit:

(A) the details of the Escort Plan shall be reviewed and discussed as part of the pre-escort conference (section 851.7);

(B) as part of the pre-escort communications, the pilot or, if there is no pilot on board, the master shall notify the Clearing House that the plan has been reviewed, and shall inform the Clearing House of the tugs that have been chosen for the escort.

(5) the Checklist format, as described in this section, shall be used for all escorted transits unless or until an Escort Plan is submitted by the vessel owner/operator, and approved by the Administrator.

(d) Completion, review and use of Escort Plans prepared using the Checklist format developed by the Harbor Safety Committee:

(1) the Checklist shall include all the items enumerated in subsection 851.5.1(a), as well as a schematic drawing of a tank vessel sufficient to illustrate the location of the bitts and chocks, and those areas on the hull that are capable of withstanding the forces exerted by the escort tug(s). The Administrator shall provide a copy of the approved Checklist to the Clearing House for distribution to tank vessel owner/operators, masters and/or pilots.

(2) the master shall complete the Checklist, and shall verify that all the requisite elements have been included. The master shall sign the Checklist to indicate that, to the best of the master's knowledge, the information on the Checklist is correct, and is in compliance with the requirements of this subchapter. If there is no pilot on board, the master shall notify the Clearing House when the Checklist has been completed and shall inform the Clearing House of the tugs that have been chosen for the escort. The Administrator may request a copy of any Checklist at any time to determine if the planning process has been completed adequately.

(3) the Checklist shall be completed by the tank vessel master at the following points during a transit operation;

(A) for vessels arriving from sea, the Checklist shall be completed prior to entering Zone 1;

1. Alternatively, the agent or owner/operator may complete the Checklist and electronically send the completed form to the master and the Clearing House:

a. before the vessel's estimated time of arrival to the San Francisco Bay Pilotage area, or

b. before the vessel's arrival at the San Francisco Bay Precautionary Area, or

c. after the vessel's departure from its last Port of Call.

(B) for in-bay movements or for departures, the Checklist shall be completed prior to beginning the transit.

(4) if a pilot is on board, the pilot shall review the Checklist as cited in subsection 851.5.1(d) and shall verify that all the elements have been completed adequately. The pilot shall sign the Checklist after reviewing and verifying its adequacy. The pilot shall then notify the Clearing House that the planning process has been completed, and shall inform the Clearing House of the tugs that have been chosen for the escort.

(A) the pilot shall determine that the Checklist is adequate if the following are met:

1. all the items on the Checklist have been addressed completely; and

2. the information provided demonstrates that the tank vessel master is prepared to take the actions necessary to assure a reasonable level of success in using the escort tug(s) in response to a vessel casualty.

(B) if the pilot determines that the Checklist is not adequate, the pilot shall notify the Clearing House, and explain the reason(s) for such determination. The Clearing House shall then immediately notify the Administrator that a Checklist has been determined to be inadequate by the pilot.

(C) The Administrator shall review all inadequacy determinations made by a pilot and shall decide whether the determination is appropriate. The Administrator may affirm or overturn such determination, or may provide for conditional approval of a Checklist, as follows;

1. the Checklist will be considered adequate if it is complete, if the tug to tanker match has been done in accordance with this subchapter, and the information provided demonstrates that the tank vessel master is prepared to take the actions necessary to assure a reasonable level of success in using the escort tug(s) in response to a vessel casualty. If a Checklist is determined to be inadequate, the vessel may be ordered to discontinue operations until an adequate Checklist is completed;

2. a Checklist may be approved conditionally if there is a minor deficiency in one or more of the requisite elements. Conditional approval may require that the tank vessel operate under specified precautionary measures (such as operating at a slower speed). If the owner/operator of a tank vessel fails to comply with the requirements of the conditional approval, the Administrator may order the tank vessel to discontinue operations until

an acceptable Checklist for that vessel has been completed and approved.

(D) The pilot is not responsible for delaying or stopping the transit solely because of a plan's inadequacy.

(5) The tank vessel owner/operator or the master shall ensure a copy of the completed, signed Checklist is submitted to the Clearing House within 14 days after the transit covered by the Checklist. The master, pilot, ship's agent or vessel owner/operator may send the copy to the Clearing House. A copy of the Checklist shall also be maintained aboard the vessel for a period of one year after the transit. A copy of the Checklist shall be made available to the Administrator upon request.

Note: Authority: Sections 8670.17.2(a) & 8670.23.1(d), Government Code.
Reference: Sections 8670.17.2(b) and 8670.23.1(e)(1), Government Code

"851.6 Clearing House Responsibilities."

(a) The Administrator shall establish a Clearing House which shall be responsible for performing escort compliance and monitoring duties, to include the following:

(1) monitor, verify, and record the braking force of each escort tug that will be used to comply with this subchapter;

(2) ensure that the braking force measurement is certified by the American Bureau of Shipping (ABS) or by any member in the International Association of Classification Societies;

(A) the braking force measurement shall be monitored by the Clearing House for those escort tugs that are tested in the San Francisco Bay region;

(B) escort tugs may be tested in another port if the braking force measurement is conducted in a manner consistent with the ABS (or equivalent) standards as used by the Clearing House. The tug owner/operator shall register such measurement with the Clearing House, and shall provide verification that the measurement complies with the ABS (or equivalent) standards.

(3) maintain and publish a register which lists the following for each escort tug whose braking force is measured under this section:

(A) the tug's name;

(B) the tug operator;

(C) the length of the tug;

(D) for tractor tugs, bollard pull ahead or astern, or the braking force determined by an alternate compliance model developed in accordance with the requirements of this subchapter;

(E) for conventional tugs, bollard pull astern;

(F) type and configuration of the propulsion system;

(G) type and configuration of the steering system;

(4) receive notification of a tank vessel's arrival and/or movement as required under section 851.7;

(5) receive notification of the displacement of a tanker, and the tug(s) chosen for an escorted transit. The Clearing House shall use this reported information to determine if the tanker is correctly matched to the escort tug(s) as required in this subchapter, and shall immediately report to the Administrator when such a match has not been done correctly. The verification shall be made prior to the tanker's arrival and/or movement. The Clearing House shall also be responsible for verifying the tug vessel's stability when these tugs are operating westward of the Golden Gate Bridge as specified in Section 851.8(f);

(6) receive notification of the deadweight tonnage of a barge and the tug(s) that have been chosen for the escorted transit. The Clearing House shall use this reported information to determine if the barge is correctly matched to the escort tug(s) as required in this subchapter, and shall immediately report to the Administrator if the match has not been done correctly. The verification shall be made prior to the arrival and/or movement of the barge;

(7) maintain copies of blank Checklists for distribution upon request to tank vessel owner/operators, masters and/or pilots. Pilots shall have blank Checklists available when boarding the tank vessel;

(8) receive notification of the completion of an Escort Plan, or the completion and adequacy of a Checklist, and report to the Administrator when a pilot makes a determination that a Checklist is not adequate;

(9) maintain copies of the completed Checklists submitted by the tank vessel owner/operators or masters. Copies must be kept for a period of 3 years from the date of the transit covered by the Checklist. A copy of any Checklist shall be made available to the Administrator upon request;

(10) maintain the list of training programs approved by the Administrator and provide a copy of that list upon request to any interested party;

(11) receive reports from tug owners, operators or agents of any tug casualty that occurs during an escorted transit, and develop and maintain a database of all such casualty reports;

(12) monitor compliance with the requirements of this subchapter and report all violations to both the Office of Spill Prevention and Response and the Harbor Safety Committee for the San Francisco Bay Region.

(b) The Administrator shall ensure that the duties of the Clearing House are performed in an effective and impartial manner. The Administrator may enter into a contract or establish a memorandum of understanding to designate an individual, organization, corporation or agency to operate as the Clearing House.

(c) The Clearing House shall be authorized to assess and collect a fee to cover the costs incurred in complying with the tug escort requirements of this subchapter. The owner/operators of all escort tugs and all tank vessels required to have a tug escort shall pay the fee assessed by the Clearing House.

Note: Authority: Sections 8670.17.1, 8670.17.2(a) and 8670.23.1(d), Government Code.
Reference: Section 8670.17.1 and 8670.23.1(e)(1), Government Code

"851.7 Communication and Reporting Requirements Before, During and After an Escorted Transit"

(a) No more than one hour prior to entering or transiting the marine waters of the San Francisco, San Pablo or Suisun Bays, the pilot or, if there is no pilot onboard, the master of a tank vessel shall report the vessel's name and position to the Clearing House, and shall report the status of the vessel as follows:

(1) tank vessels carrying 5,000 or more long tons of oil as cargo shall report as "*Escort Required*"; or

(2) tank vessels carrying less than 5,000 long tons of oil as cargo <u>and requiring no escort need not be reported.</u>

(b) After completing the review of the Checklist or the Escort Plan, as specified in section 851.5.1, the pilot or, if there is no pilot onboard, the master of the tank vessel shall report the following to the Clearing House:

(1) a statement that the Escort Planning process has been completed;

(2) if a pilot is onboard, a statement from the pilot as to whether the Checklist is completed, and whether the Checklist is or is not adequate;

(3) a listing of the tugs that were chosen for the escort during the Escort Planning process;

(4) for a tanker, the vessel's displacement;

(5) for a barge, the vessel's deadweight tonnage.

(c) Pre-Escort Conference: Before commencing an escorted transit, the pilot or, if there is no pilot onboard, the master of the tank vessel shall initiate communications with the escort tug(s). During this pre-escort conference, all parties shall plan and discuss the details of the escorted transit as specified on the Checklist or in the Escort Plan, including, but not limited to, the

following:

(1) the intended route;

(2) the intended destination;

(3) the speed of the vessel;

(4) the positioning of the escort tug(s) relative to the tank vessel being escorted;

(5) the manner in which an emergency connection would be made between the escort tug and tank vessel;

(6) radio communications, including primary and secondary frequencies; and

(7) anticipated weather and tidal conditions.

(d) The master of the escort tug(s) shall report the name of the tug(s) and the name of the tank vessel to the Clearing House upon arrival at the following locations:

(1) for inbound tank vessel movements; when passing Alcatraz, and when on-station;

(2) for in-bay and outbound tank vessel movements; when on-station at the tank vessel prior to movement of the tank vessel.

(e) At all times during the escorted transit, the master or pilot of the tank vessel shall maintain direct, two-way radio communication with the master or pilot of the escort tug. The radio communication shall be on a channel agreed to by both the master or pilot of the tank vessel and the master or pilot of the escort tug.

(f) Reporting tug casualties during and after an escorted transit:

(1) the master of the escort tug shall immediately notify the master or pilot of the escorted vessel of any casualty that occurs to the tug during the escorted transit. A casualty shall include any loss of main propulsion, primary steering, or any component or system that reduces the maneuverability of the tug, or any other occurrence that adversely affects the tug's ability to perform the escort function;

(2) the tug owner, operator or agent shall file a written casualty report with the Clearing House within 72 hours of occurrence. The Clearing House shall maintain a database of these reports <u>for three years</u>.

Note: Authority: Sections 8670.17.2(a) & 8670.23.1(d), Government Code.
Reference: Section 8670.23.1(e)(1), Government Code.

"851.8 Requirements for Escort Tugs; Braking Force Measurement, Crew and Training Standards, Equipment and Stationing Criteria."

(a) Braking force measurement:

(1) any escort tug used to comply with the requirements of this subchapter must have its braking force verified and registered with the Clearing House, as follows;

(A) for tractor tugs escorting in an ahead position the braking force is measured as the ahead bollard pull;

(B) for tractor tugs escorting in an astern position the braking force is measured as the astern bollard pull;

(C) for conventional tugs the braking force is measured as the astern bollard pull.

(2) the braking force of each escort tug must be re-measured at least once every 3 years from the date of the initial measurement, or sooner if the operating capability or braking force of the tug has been degraded by 10% or more. The new measurements must be verified and registered with the Clearing House.

(3) The Clearing House shall publish procedures and standards to be followed when conducting braking force measurement. These procedures, entitled “San Francisco Bay Region Clearing House, Rules for Bollard Pull Tests”, dated May 19, 2000, are incorporated by reference. These procedures and standards shall be made available upon request to the Clearing House.

(b) Any escort tug used to comply with the requirements of this subchapter, must meet crew standards as follows:

(1) An escort tug shall have a minimum of four persons on board including one certified tug master and two certified deck hands. The fourth person shall be a crew member capable of resolving mechanical difficulties aboard an escort tug in the event of an emergency;

(2) The requirement for four crew members does not preclude additional deck hands who are gaining experience for certification;

(3) The certified deck hands required under this subsection shall at all times be awake, alert and ready to respond during an escorted transit. The fourth person must be immediately available to respond to any mechanical difficulties aboard the escort tug. Immediate response may be assured by an alarm or other signaling device to wake or alert the fourth person to the emergency.

(A) The Administrator may review the equipment and crew on an escort tug to

assure compliance with this provision. The Administrator may require that the fourth person be awake and alert and ready to respond if the tug operator does not provide adequate mechanism to assure that the fourth person is immediately available to respond to a mechanical difficulty.

(4) Working hours for escort crew members shall be limited to 15 hours in any 24-hour period, not to exceed 36 hours during any 72-hour period except in an emergency or a drill. Working hours shall include any administrative duties associated with the tug whether performed on board the tug or on shore.

(c) Training requirements for the crew of any escort tug used to comply with the requirements of this subchapter are as follows:

(1) to qualify for certification as the master or deck hand on an escort tug, an applicant must do all of the following;

(A) possess a current and valid U.S. Coast Guard Merchant Mariner's Document;

(B) show proof of at least 960 hours on duty of prior service aboard a tug, at least 240 hours of which must have been in the San Francisco Bay region;

(C) successfully complete an approved education program which covers the following topics;

1. basic tugboat seamanship;

2. line handling skills;

3. communication systems;

4. emergency response to the loss of steering or propulsion on an escorted tank vessel and on the escort tug itself.

(2) in addition to the requirements of subsection 851.8(c)(1), certification as the master of an escort tug requires that the applicant also do the following:

(A) possess a U.S. Coast Guard license appropriate to the escort tug in service; and

(B) show proof of an additional 240 hours on duty of service aboard a tug in the San Francisco Bay region (for a total of 480 of the requisite 960 hours of service); and

(C) successfully complete an approved education program which covers knowledge of local waters, basic seamanship, and the use of the escort tug in reducing the risk of an escorted vessel's grounding or collision.

(3) individuals may be considered to have satisfied certain educational requirements without attending an education program, if they meet the following criteria:

(A) an individual with a U.S. Coast Guard rating of Able Seaman Special (OSV) is considered to have met the educational requirements in subsection 851.8(c)(1)(C) 1 and 2;

(B) an individual with any Coast Guard license appropriate for the escort tug in service is considered to have met the educational requirements in subsections 851.8(c)(1)(C).

(4) the Administrator shall review and approve the educational programs for masters and deck hands of escort tugs, and shall establish and maintain a list of all such approved programs:

(A) an educational program shall be approved if it provides the coursework required by this section, and can adequately train students in the requisite skills;

(B) a request for approval of a program shall be submitted to the Administrator in writing and shall include the following:

1. a description of the course content and materials;

2. the qualifications of the instructors;

3. the estimated cost of the program to the students;

4. a description of the site(s) where the course will be held, both classroom and field locations.

(C) the Administrator shall notify the applicant of approval or denial within 30 days of the submittal of the application;

1. if the educational program is denied, the applicant will be notified of the reasons for denial and may resubmit the program for review after the deficiencies have been remedied;

2. once approved, the educational program must be submitted for re-evaluation at least once every 5 years or when a significant change occurs in the course content or materials. The 5-year re-submittal shall include an updated description of course content, materials, cost, and instructor qualifications, as well as copies of student evaluations from classes conducted during the previous year;

3. the Administrator may audit the course at any time to assure compliance with the requirements of this section.

(5) The Administrator shall assure compliance with tug crew training and qualification requirements. Compliance with crew training and qualification requirements shall be verified

as follows:

(A) tug owner/operators shall establish and maintain adequate documentation to verify the training and qualifications of individual crew members, and shall make this information available to the Administrator upon request;

(B) the Administrator may review the owner/operator's documentation annually to assure compliance with this section;

(C) the Administrator may request this documentation at any time.

(d) The following equipment must be onboard an escort tug and in operable condition during all escorted transits;

(1) a line-throwing gun for use in Zone 1, with 300 feet of tag line. The tag line shall be of suitable strength and size for deploying the tow line;

(2) power line-handling equipment fore or aft for rapid, mechanically assisted deployment of lines. The primary line-handling equipment shall be in the position (fore or aft) best suited for the design of the particular tug in escort service;

(3) tow line with a breaking strength that is 2.5 times the certified braking force of the escort tug;

(4) a quick release device to be used when an escort tug is in a tethered mode;

(5) one working radar;

(6) fendering appropriate to absorb impact in skin-to-skin operations, and located at both the bow and stern to act as pivot points when pulling away from the tank vessel. In addition, the fendering must be sufficient to assure that there are no exposed corners, large holes or metal parts which could inflict damage on the escorted vessel, and must cover sufficient surface area to minimize sliding when working at an angle to the tank vessel.

(e) Annual inspection of the escort tug's equipment:

(1) the owner/operator shall assure that the required equipment is on board and operable during all escorted transits;

(2) the Administrator shall verify that the required equipment is on board each escort tug, and in operable condition. This verification may be obtained by an annual inspection which may be announced or unannounced. In conducting such inspections, the Administrator shall be guided by the standards established by the American Waterways Operators (AWO) in their Responsible Carrier Program, Sections III and IV, dated 2/21/95.

(f) Stability requirements for all escort tugs that operate westward of the Golden Gate Bridge are as follows:

(1) an escort tug shall have a load-line certificate; or

(2) an escort tug shall have a letter verifying stability issued by the American Bureau of Shipping or any member in the International Association of Classification Societies. The letter shall establish that the escort tug complies with the stability requirements outlined in federal Load Line Regulations at 46 CFR, Sections 42.09-10(a), 42.09-15(a), (b), and (c) except subparagraphs (1) and (2), and 42.09-25 (a) and (b) except for the portion of the last line of (b) that reads "...and meeting applicable requirements in this subchapter"; and 46 CFR Sections 173.090, 173.095 and 174.145. A copy of this letter shall be kept on file with the Clearing House.

(g) Stationing requirements for escort tugs:

(1) an escort tug shall not simultaneously engage in the escort of more than one tank vessel;

(2) escort tugs shall maintain a station-keeping distance of no more than 1000 feet ahead or aside, or 500 feet astern of the tank vessel while engaged in escort activity;

(3) escort tugs shall standby as the tank vessel transits Zones 3 and/or 5, as follows:

(A) the escort tug(s) shall standby in Zone 2 or 6 as the tank vessel transits Zone 5; and

(B) the escort tug(s) shall standby in Zone 2 or 4 as the tank vessel transits Zone 3; or

(C) the escort tug(s) may accompany the escorted tank vessel through Zone 3 and/or 5 in lieu of standing by.

i. (4) in Zone 1, the escort tug(s) shall be stationed as follows:

(A) on an inbound transit, the escort tug shall be in Zone 1 prior to the tank vessel's arrival to the area bounded by an arc eight nautical miles seaward of and centered on Mile Rocks Light; and

(B) on an outbound transit, the escort tug shall remain in Zone 1 until the tank vessel leaves the area bounded by an arc eight nautical miles seaward of and centered on Mile Rocks Light.

(h) Escort transit log:

(1) escort tug masters shall keep a record in the ship's log of every escorted transit;

(2) the record of the escorted transit in the ship's log shall include information regarding the sequence of events during the transit, the crew assignments, any casualties that may occur, and any drills conducted.

Note: Authority: Sections 8670.17.2(a) & 8670.23.1(d), Government Code.
Reference: Section 8670.23.1(e)(1), Government Code, and 46 CFR Sections 173.090, 173.095 and 174.145.

"851.9 Tanker and Tug Matching Criteria, and Tanker Crew and Equipment Requirements"

(a) Default Matrix Option for Matching Tugs to Tankers: The tug or tugs used for an escorted transit shall be able to provide sufficient braking force to stop the escorted tanker from a speed of 5 knots through the water. The braking force of the tug(s) shall match the tanker's displacement, as indicated in the following matrix:

	Zones 1 and 2					Zones 4 and 6				
Assisting Current	slack	1 kt	2 kts	3 kts	4 kts	slack	1 kt	2 kts	3 kts	4 kts
Displacement*	Braking Force in kips (1,000 pounds of force)									
0 to < 20	20	20	30	40	40	40	50	70	90	110
20 to < 30	20	30	40	50	60	50	70	90	120	160
30 to < 40	30	40	50	60	70	60	90	120	160	210
40 to < 50	30	40	60	70	90	70	110	150	200	250
50 to < 60	40	60	70	90	110	100	140	190	250	320
60 to < 80	50	70	90	120	140	120	180	250	330	420
80 to < 100	60	80	110	140	180	150	220	300	400	520
100 to < 120	70	100	130	170	210	180	270	370	500	650
120 to < 140	80	110	150	190	240	210	310	430	580	760
140 to < 160	90	140	190	240	310	240	350	490	660	860
160 to < 180	100	150	210	270	350	260	390	550	740	970
180 to < 200	110	170	230	300	390	**	**	**	**	**
200 to < 220	120	180	250	330	420	**	**	**	**	**

* 1,000 long tons

** The channel depths in zones 4 and 6 limit vessels that may use the channel to those drawing less than 35 feet. This table does not address vessels in zones 4 and 6 with a displacement greater than 180,000 long tons because such vessels would draw more than 35 feet and would thus not be allowed into these zones.

(1) Applicable current velocity: The current velocities shall be determined using the published tide and current tables developed and maintained by NOAA, and used by the pilots. The current velocity used shall be the one published for the estimated time of arrival at the points noted below. The estimated time of arrival shall include a window of 30 minutes before and after the scheduled arrival to account for possible delays or changes. Tank vessel operators are responsible for adjusting the estimated arrival time when it appears that it will fall outside of the originally estimated one hour window.

(2) Location of current readings: The specific current velocity to be used in conjunction with the matrix shall be the published readings for the following locations:

(A) The Golden Gate Bridge - the predicted current velocity at the Golden Gate Bridge shall apply to vessels in zones 1 and 2 that are west of a north-south line drawn through the eastern tip of Alcatraz Island and terminating at Angel Island or to vessels in zones 1 and 2 that are west of the eastern entrance to Racoon Strait.

(B) The Bay Bridge; west of Yerba Buena Island - the predicted current velocity at the Bay Bridge shall apply to vessels in zone 2 that are south of an arc drawn from Alcatraz Island east to Treasure Island and east of the north-south line drawn through Alcatraz Island.

(C) 1.25 miles north of Point Chauncey - The predicted current velocity at 1.25 miles north of Pt. Chauncey shall apply to vessels in zone 2 that are north of an arc with a radius of 2.7 nautical miles centered at the intersection of the Bay Bridge and the San Francisco Peninsula drawn from Alcatraz Island east to Treasure Island and east of the north-south line drawn through the eastern tip of Alcatraz Island.

(D) The San Mateo Bridge The predicted current velocity at the San Mateo Bridge shall apply to vessels while in zone 4.

(E) The Carquinez Bridge - the predicted current velocity in Carquinez Strait shall apply to vessels in zone 6.

How to use the Default Matrix Option for Matching Tugs to Tankers: The matrix provides current velocities for slack water, 1, 2, 3, and 4 knots. The slack water column shall be used only when the water is truly slack. The 1 knot column shall be used for any velocity above 0 and equal to 1. The 2 knot column shall be used for any velocity above 1 and equal to 2, and so on up to the 4 knot maximum.

In those situations where the current velocity is above 4 knots, such as may occur at the Golden Gate, the tank vessel requiring an escort tug shall reschedule the transit to a time when the current velocity drops to 4 knots or below.

(b) Alternative To The Default Matrix for Matching Tugs to Tankers: Measurement methodologies other than those used to establish the Default Matrix may be used instead of, or in addition to, the Matrix as follows;

(1) Alternate Compliance Model for Escort Tugs: Tug owner/operators may propose an alternate method for measuring the braking force of any tug (in kips). Such alternate method may be used to demonstrate that the tug can provide higher steering or braking forces (in kips) than the simple bollard pull measurement would indicate. An alternate measurement may only be submitted once in any 12 month period and shall comply with the following:

(A) the owner/operator shall assure that the following are included when developing a methodology for calculating an alternate braking force for a given escort tug:

1. the alternate measurement is conducted from a starting speed of 10 knots for zones 1 and 2, and 8 knots for zones 4 and 6;

2. the escort tug is not required to exceed the limits of its ability to generate the forces, and in no instance submerges the deck edge to achieve the alternate measurement;

3. the escort tug operates all its equipment at or below the manufacturer's recommended guidelines for the safe working load of the tug;

4. unless demonstrated otherwise by full scale testing, all machinery shall be assumed to operate at or below performance levels published by the manufacturer;

5. any current bollard pull values registered with the Clearing House shall be utilized where appropriate in any formulas or models;

6. any known condition that would impair the escort tug's ability to perform shall be included in the calculation.

(B) the measurement must be conducted by a marine architect or engineer approved by the Administrator;

1. the tug owner/operator shall submit the name of the marine architect or engineer to the Administrator for approval prior to having that individual or his/her company conduct an alternate measurement.

2. the Administrator shall approve a marine architect or engineer if that person has demonstrated the education, knowledge and experience necessary to conduct the testing and modeling of tug capabilities and braking force.

(C) the alternate model and the resultant measurements shall be approved by the Administrator before the alternate model may be used to match a tanker to a tug or tugs. The Administrator shall approve the alternate model if it provides both of the following:

1. a higher force (in kips) than the simple bollard pull measurement would indicate; and

2. at least the same level of protection as the braking forces established in the default matrix.

(D) after an alternate model is approved, the Administrator shall provide the Clearing House with the new braking force measurements for the subject tug(s). The new measurements shall be used with the Default Matrix established in this section.

(2) Alternate Compliance Model for Tankers: Tanker owner/operators may develop a model for the vessels in their fleet relative to the steering and braking demands of the vessels, and the braking capabilities of tugs. The steering and braking demands established by the alternate model may be used instead of the Default Matrix to match escort tugs to the tankers. An alternate compliance model may only be submitted once in any 12-month period and shall comply with the following:

(A) the measurement must be conducted by a marine architect or engineer approved by the Administrator. The tanker owner/operator shall submit the name of the marine architect or engineer to the Administrator for approval prior to having that individual or his/her company conduct an alternate model;

1. the Administrator shall approve a marine architect or engineer if that person has demonstrated the education, knowledge and experience necessary to conduct the testing and modeling of tug capabilities and braking force.

(B) the alternate model and the resultant measurements shall be approved by the Administrator before the alternate model may be used to match a tanker to a tug or tugs. The Administrator shall approve the alternate model if the following conditions are met:

1. under the alternate model the tanker can complete a safe transit, staying within the 95th percentile of constraint as established in "The San Francisco Bay Tanker Escort Study", dated 7/95, prepared by Glosten Associates; and

2. the alternate model provides at least the same level of protection as the braking forces established in the Default Matrix, and can be achieved using no more than three tugs as required in subsection 851.9(~~c~~d).

(C) After an alternate model is approved, the Administrator shall provide the Clearing House with the tanker demand in kips which corresponds to the tanker's displacement and speed under the approved alternate model.

(c) The Administrator may allow deviations from compliance for the matching of tugs to laden tankers when these vessels make short transits from berth to berth within a zone and are assisted by docking tugs and transiting at speeds less than 8 knots.

(1) The tanker master or owner/operator shall make a request for such deviations to the Administrator through the Clearing House at least 24 hours prior to the desired shift.

(2) The Administrator shall approve or deny the deviation request by verbally notifying the Clearing House within 12 hours of the request. A written confirmation shall follow within 24 hours.

(d) Maximum number of tugs to be used during an escorted transit:

(1) the tanker must be accompanied by a sufficient number, but no more than three tugs to provide the braking forces specified in this section;

(e) Speed limits for tankers are as follows:

(1) tankers that use the Default Matrix as provided in this section, shall not proceed at a speed in excess of 10 knots through the water in Zones 1, 2, 3 and 5, nor more than 8 knots through the water in Zones 4 and 6, with the following qualifications:

(A) the speed or speeds selected by the tanker for the transit must permit stationing the escort tug(s) to allow the tug(s) to effectively influence the tanker's movement in the event of a casualty;

(B) the tanker shall proceed at a safe speed. The determination of a safe speed shall include, but not be limited to;

1. environmental factors such as the depth of the water, visibility, wind conditions, and the speed of the tidal currents; and

2. proximity of other vessel traffic and any other vessels at anchor.

(C) Tankers shall in any case have their engines ready for immediate maneuver and shall not operate in any control modes or with fuels that prevent an immediate response to an engine order.

(2) tank vessels may be exempt from the speed limits specified in subsection 851.9(e)(1) if they establish and use an approved alternate compliance model for determining the steering and braking demands of their vessels, as provided in this section. In such cases, the speed limit will be that used to establish the alternate compliance model, and must be specified in the Escort Plan, or on the Checklist.

(f) Crew requirements:

(1) a tanker shall have sufficient and qualified line-handling-capable crew members standing by and available to immediately receive lines from each escort tug. These crew shall be stationed proximate to the lines, and shall not be assigned duties that would interfere with their ability to immediately respond to an emergency situation;

(2) the tanker shall comply with all applicable federal regulations relating to anchor readiness;

(3) tankers shall have sufficient and qualified supervisors to provide direct supervision of line-handling crew operations. Supervisors shall have direct radio communication capability with the bridge of the tanker.

(g) Equipment requirements:

(1) each tanker shall have deck chocks and bitts that are of sufficient size, strength, and number to accommodate the anticipated braking force of the escort tug(s);

(2) the tanker owner/operator shall indicate the location and strength of the bitts and chocks in the Escort Plan for each vessel.

Note: Authority: Sections 8670.17.2(a) & 8670.23.1(d), Government Code.
Reference: Section 8670.23.1(e)(1), Government Code

"851.9.1 Barge and Tug Matching Criteria, and Barge Crew and Equipment Requirements"

(a) A barge must be accompanied by a sufficient number, but no more than three tugs to provide the braking force specified in this section;

(1) the line-haul tug which provides the power to push or tow a barge shall not become an escort tug during the course of a transit unless the line-haul tug has been relieved of its duties as the primary towing vessel, and replaced with another tug that serves as primary towing vessel.

(2) any line-haul tug that does become the escort tug after being relieved of all line-haul duties, must meet all the requirements for escort tugs as specified in this subchapter.

(b) The tug or tugs used to escort a barge must be able to provide sufficient braking force to stop the barge, measured as follows:

(1) the braking force shall be measured as the escort tug's astern static bollard pull;

(2) the escort tug shall have total astern static bollard pull in pounds equal to, not less than, the barge's deadweight tonnage;

(c) A barge shall not exceed 8 knots through the water during an escorted transit.

(d) Crew Requirements:

(1) A barge shall have sufficient and qualified line-handling-capable deck hands onboard the barge, standing by and available to receive lines from each escort tug;

(A) the deck hands for the barge shall be made available from the line-haul tug;

(B) in the interest of crew safety, when entering or leaving Zone 2 bound to or from the sea (Golden Gate Bridge), crew transfers to or from the barge may be made

in the vicinity of Alcatraz Island;

(C) when a barge is fitted with an emergency tow wire, or comparable mechanical device of sufficient strength and handling characteristics to control the barge, or the escort tug is made fast to the barge, deck hands shall not be required on board the barge.

(2) Barges shall have sufficient and qualified supervisors to provide direct supervision of line-handling crew operations. Supervisors shall have direct radio communication capability with the bridge of the tug that is towing the barge.

(e) Equipment requirements:

(1) each barge shall have deck chocks and bitts that are of sufficient size, strength and number to accommodate the anticipated braking force of the escort tug(s);

(2) the barge owner/operator shall indicate the location and strength of the bitts and chocks I n the Escort Plan for each vessel or on the Checklist for each transit.

Note: Authority: Sections 8670.17.2(a) & 8670.23.1(d), Government Code.
Reference: Section 8670.23.1(e)(1), Government Code

"851.10 Penalties

Any person who knowingly, intentionally or negligently violates any provision of this subchapter shall be subject to criminal, civil, and/or administrative civil actions as prescribed in Article 9, Government Code, beginning with Section 8670.57.

Note: Authority: Sections 8670.17.2(a) & 8670.23.1(d), Government Code.
Reference: Sections 8670.23.1(e)(1) & Article 9, Sections 8670.57 through 8670.69.6, Government Code.

"851.10.1 Requests for Redetermination"

The owner/operator of a tank vessel or an escort tug may request redetermination of an action taken relative to an inadequacy decision or conditional approval of an Escort Plan or Checklist, denial or revocation of approval of an educational program, or application for use of an alternative compliance model. A request for redetermination must be submitted in writing and shall be processed as follows:

(a) the request must be submitted to the Administrator within 15 calendar days from the date of the decision being disputed;

(a) the request must contain the basis for the redetermination and, if available, provide evidence which rebuts the basis for the decision;

(a) within 15 calendar days following the receipt of the request for redetermination, a notice shall be sent indicating that the Administrator shall adhere to the earlier decision or that

the decision has been modified or rescinded.

Note: Authority: Sections 8670.17.2(a) and 8670.23.1(d), Government Code.
Reference: Sections 8670.23.1(e)(1) and Article 9, Sections 8670.57 through 8670.69.6, Government Code.

VEHICULAR BRIDGE INVENTORY

VEHICULAR BRIDGE MANAGEMENT

BRIDGES ENCOUNTERED BY OCEAN GOING VESSELS

(For up to date clearance information refer to the latest NOAA chart or the USCG Bridge Section)

BRIDGE NAME AND LOCATION		TYPE	CLEARANCES Horz/Vert MLLW-MHW
1. **Golden Gate Bridge**		SUS	4028/238-232
San Francisco Bay			
2. **San Francisco-Oakland**		SUS	
San Francisco Bay, Westerly Reach			
Span A-B,	Pier A		2229/180-174
	Pier B		229/223-217
Span B-C,	Pier B		1072/224-218
	Pier C		1072/227-221
Span C-D,	Pier C		1079/226-220
	Pier D		1079/224-218
Span D-E,	Pier D		2210/224-218
	Pier E		2210/181-175
Span E-YB Isl,	Pier E	F	870/176-170
3. **Richmond-San Rafael**		F	
San Francisco Bay			
Main Channel,	Center Span		1000/190-185
	Left and Right Span		480/173-168
East Channel,	Center Span		970/140-135
4. **Carquinez**		F	
Carquinez Strait, Vallejo			
Upstream Bridge:			
South (left) Span,	South Pier		998/141-135
South (left) Span,	North Pier		998/151-145
North (right) Span,	South Pier		1000/152-146
North (right) Span,	North Pier		1000/157-151
Downstream Bridge:			
South (left) Span,	South Pier		1030/140-134
South (left) Span,	North Pier		1030/150-144
North (right) Span,	South Pier		1030/153-147
North (right) Span,	North Pier		1030/158-152
5. **Martinez, Highway Bridge**		F	
Martinez/Benicia			440/141-135
6. **Martinez, Union Pacific RR Bridge**		V/L	
Martinez/Benicia,		Raised	291/140-135
		Lowered	291/75-70
7. **Antioch**		F	
Antioch, CA – San Joaquin River			400/142-138

MSO San Francisco Bay Pollution Statistics April 1, 2002 to May 31, 2003

	Apr-02	May-02	Jun-02	Jul-02	Aug-02	Sep-02	Oct-02	Nov-02	Dec-02	Jan-03	Feb-03	Mar-03	Apr-03	May-03
Total Reported Oil Pollution Incidents	27	26	32	26	32	30	25	30	25	12	25	18	28	22
MSO	26	20	29	26	32	26	23	25	0	10	23	16	8	2
Eureka Detachment	1	6	3	0	0	4	2	5	0	2	2	2	20	20
Penalty Action:														
Civil Penalty (MV)	1	0	0	1	1	0	0	1	0	0	1	0	10	1
Civil Penalty (TK)	2	1	5	2	2	8	5	6	5	0	1	2	4	3
Letter of Warning	7	5	5	3	5	10	2	9	8	2	4	2	2	4
No Action Required	16	15	19	20	24	8	16	9	12	8	17	12	4	12
Source Type:														
Deep Draft Vsl	0	0	0	0	0	0	0	0	0	1	1	0	0	0
Facility (All non-Vsl)	6	0	5	4	4	1	1	2	1	2	9	2	0	2
Military/Public Vsl	1	0	0	4	4	0	0	0	0	2	0	1	0	1
Fishing Vsl	1	1	1	3	3	2	2	6	5	0	0	0	6	0
Commercial Vsl	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Commerical Vsl	5	6	3	5	5	15	4	4	7	2	1	5	10	7
Unknown Source	10	14	20	16	16	8	16	13	12	3	12	8	4	10
Other Info:														
OSTLF/CERCLA	1	0	1	3	3	3	3	0	1	1	0	0	0	1
Cases														
HazMat	4	0	0	0	0	0	0	0	0	1	0	0	0	0
POLREP Cases	1	1	2	6	7	3	3	0	2	1	2	0	0	1
Cleanup Required	9	0	1	6	6	6	3	4	2	1	2	2	2	2

MSO San Francisco Bay Pollutions Statistics 1994-2000

	1994	1995	1996	1997	1998	1999	2000	Ave 98-00	Ave/Mo over 3 yrs
Total Reported Oil Pollution Incidents	664	553	408	332	352	263	363	327.5	27.3
MSD	99	86	58	59	97	102	94	88.0	7.3
Civil Penalty (MV)	151	125	110	97	39	17	11	103.5	8.6
Civil Penalty (TK)					26	9	30	21.7	1.8
Letter of Warning					24	38	75	45.7	3.8
No Action Required					202	146	247	198.3	16.5
	1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**		
Deep Draft Vsl	20	11	3	6	6	4	8	6.0	0.5
Facility (All non-Vsl)	38	27	7	9	35	34	75	48.0	4.0
Military/Public Vsl	33	30	21	14	10	4	7	7.0	0.6
Fishing Vsl	25	22	27	18	34	21	45	33.3	2.8
Commercial Vsl (since 1998)					37	13	20	23	1.9
Non-Commercial Vsl (Rec)	213	149	78	106	56	47	77	60.0	5.0
Unknown Source	146	117	120	88	174	82	134	130.0	10.8
OSTLF/CERCLA Cases	18	17	10	16	15	13	13	13.7	1.1
HAZMAT	44	35	7	8	2	1	6	3.0	0.3
POLREP Cases					20	18	29	22.3	1.9
Cleanup Required					53	28	90	57.0	4.8

Recommendations for conducting Escort Training on San Francisco Bay

1.0 OVERVIEW

The members of the San Francisco Harbor Safety Committee recognize that for the Tug Escort System to perform as anticipated, all phases of its operation should be exercised. By training, pilots and tug operators will practice using the escort command language. They will also expand their knowledge of the capabilities and limitations of the various tugs employed in escorting operations, and how best to utilize that tug in an emergency. Further, the user of the service, the ship's crew, will also gain valuable knowledge that they can apply in other ports by observing and participating in these training exercises.

Each organization is encouraged to participate in this training opportunity and to internally document their exercises.

2.0 PURPOSE

To outline and define the process by which pilots, escort tug and ship crews can arrange for and participate in live escort training exercises. This process will enable training to be conducted under agreed upon conditions to promote the safety of all involved. This training process will allow opportunities for demonstration, practice and skill enhancement for emergency response maneuvers. Lessons learned and best practices developed during these training sessions should be shared between the participants.

3.0 SCOPE

These voluntary recommendations are for the use of all pilots and tug crews actively offering their services as escorts in the Bay. By extension, the users of the services, the escorted vessel crews will also be included in the scope of these recommendations.

4.0 RESPONSIBILITIES AND AUTHORITIES

The pilot, tug captain and ship master have the responsibility to evaluate prior to each training session if it is appropriate to conduct training under the current environmental conditions, which maneuvers are to be demonstrated, where the training will be conducted and at what speed. If all three parties cannot agree, the training will not proceed.

5.0 SCHEDULING EXERCISES

It is intended that these training exercises may be conducted when weather conditions and / or vessel scheduling allows. It is expected that the pilot will initiate the request to conduct these exercises, however the shipmaster or escort tug captain may initiate them. Each may decline to participate with no negative consequences should he or she feel that it is inappropriate.

Tug escort captains and / or mates qualified to conduct escort operations are to be pre-authorized by their companies to make the decision on board if requested by the pilot.

Prior to agreeing to conduct the training, the participants should consider weather, sea conditions, the degree of training of the participants, the speed of the escorted vessel and the maneuvers to be executed. Only when all parties agree that it is appropriate will the training proceed. Each party may also halt the training exercise if he or she becomes concerned for any reason.

6.0 TRAINING EXERCISES

When a training exercise is agreed to, the pilot and tug operator should carefully discuss the maneuvers that they want to demonstrate. The tug operator should be the one to specify at what speeds he will be comfortable performing the maneuvers in question based on his personal experience level and training. Escort training sessions should be logged.

7.0 ESCORT LANGUAGE

In order to work towards a stronger bridge team, this training will encourage all participants to use a standardized tug command language.[1]

8.0 CROSS DECK TRAINING

The San Francisco Bar Pilots, the ChevronTexaco Pilots and the independent pilots of the Bay recognize the benefit of understanding how the tug crews operate their vessels during an escort. Towards that end the pilots will be encouraged to ride on board a tug during an escort.

[1] The US Coast Guard NAVSAC Committee has endorsed a command language, and it is in use in many ports around the United States.

Tug crews are also encouraged to ride on board a tanker during an escort whenever possible. While it may be more difficult to arrange, training exercises should also be open to interested ship crews also.

9.0 TRIALS / TRAINING INFORMATION

The participants recognize that less than perfect performance may occur as part of this training process. Further, as new employees are brought on board this learning-by-doing process will continue into the future.

The participants shall not use the outcome of other organization's exercises as part of their own commercial activities. It will be acceptable to discuss one's own organization's training activities as part of your advertising if desired.