

# SAN FRANCISCO, SAN PABLO AND SUISUN BAYS HARBOR SAFETY PLAN

Voted on and approved by the  
Harbor Safety Committee of the San Francisco Bay Region  
March 12, 2009

**H**arbor  
**S**afety  
**C**ommittee  
**of the San Francisco Bay Region**

*Mandated by the California Oil Spill  
Prevention and Response Act of 1990*

Pursuant to the  
California Oil Spill and Prevention Act of 1990

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## Introduction

*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 September 18, 1991 and held its first meeting on that date. The original Harbor Safety Plan for San Francisco, San Pablo and Suisun Bays was adopted 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 chairperson may appoint work groups to review the mandated components of the Harbor Safety Plan and timely issues. All committee and work group 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 recommendations of the Harbor Safety Plan 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 and Suisun Bays, and the Sacramento River to the Port of Sacramento and the San Joaquin River to the Port of Stockton. The distance from the San Francisco lighted horn buoy outside the Bay to the Ports of Stockton and Sacramento is approximately one hundred miles. 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 on the Pacific Coasts of North and South America. Waters from the two major river systems and the Bay flow through the Golden Gate, 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, tides and strong currents occur in the Bay. While the Bay is extremely deep (356 feet) under the Golden Gate Bridge because of the swiftly moving volume of water, the Bay is very shallow in many areas and subject to sedimentation from the rivers emptying into the Bay. Sediment also is deposited outside the entrance to San Francisco Bay where a semicircular bar extends into the Pacific Ocean. The Bay itself is less than 18 feet deep over two-thirds of its area, and the Bay bottom is predominantly mud. A dredged Main Ship Channel allows deep-draft vessels to navigate the Bay.*

*The Bay presents a number of hazards to navigation, such as strong tides and currents and variable bottom depths, which confine large vessels to defined shipping lanes within the Bay. Navigating the Bay becomes more complex during periods of restricted visibility. 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 guidelines are sent to members of the shipping industry, and are based on a general consensus among pilots as to recommended navigation practices.*

*The Bay supports a variety of uses, including shipping, fishing, ferry transit and various recreational activities. There are seven ports, a number of marine terminals, and military facilities at the Military Ocean Terminal Concord (MOTCO) and Moffet Field. 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 3 identifies the location of marine terminals in the plan area. In addition, an expanding ferry system annually makes over 85,000 (2004) trips, mainly to and from San Francisco in the central part of the Bay. Because much of the Bay shoreline is urbanized, recreational boating and the growing sports of board sailing and paddle sports are popular, with an estimated 20,000 boat berths around the Bay, exclusive of the Sacramento and San Joaquin Rivers, as well as numerous boat launch sites.*

*The shipping industry is a particularly vital part of the Bay Area economy. Shipping spokespersons estimate that approximately 100,000 jobs are dependent upon the shipping industry and that the industry contributes nearly \$5 billion to the regional 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, ferries, recreational boats, commercial and sports fishing boats, board sailors, paddle sports enthusiasts and personal watercraft (jet skis) within the series of bays, channels and rivers that comprise the San Francisco Bay planning area.*

## **Organization of the Harbor Safety Committee of the San Francisco Bay Region**

The San Francisco Harbor Safety Committee consists of representatives from the following: ports (four), dry cargo vessel operators (two), tank ship operators (two) or one ship operator and one oil marine terminal operator, and one tug operator, one tank barge operator, a passenger ferry or excursion vessel operator, the regional pilot organization, a vessel labor union, a commercial fishing representative, a recreational boater, an environmental organization, the U.S. Coast Guard Captain of the Port, the National Oceanic and Atmospheric Administration, the San Francisco Bay Conservation and Development Commission, the U.S. Army Corps of Engineers and the U.S. Navy. A complete list of committee members is found in Appendix B.

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## **Executive Summary 2007/2009**

The San Francisco Bay Region Harbor Safety Committee is concerned with navigation, security and environmental issues that impact the San Francisco Bay Area. The period covered by this Harbor Safety Plan update was an exceptionally active time. On November 7, 2007, the cargo ship Cosco Busan struck the Bay Bridge in dense fog, spilling 53,000 gallons of bunker fuel into the Bay and beaches. Within days Governor Schwarzenegger directed that the state investigate the causes of the allision and make appropriate recommendations to prevent such an occurrence from happening again. The Office of Spill Prevention and Response (OSPR) called upon the Harbor Safety Committee to analyze the issues outlined in the directive and to make recommendations. After a series of many public work group meetings, the Harbor Safety Committee completed its report in July 2008, which was sent to the Governor.

Concurrently, the five California Harbor Safety Committees were directed by OSPR to adopt Best Maritime Practices that provide important guidelines for safe, reliable and environmentally sound vessel movements in each harbor. As a result of both processes, the Harbor Safety Committee adopted nine Best Maritime Practices addressing vessel movements during reduced visibility and severe weather, defined commute ferry routes, enhanced training for pilots on electronic navigation systems, and emergency training for tug escorting (see Appendix A). These guidelines are incorporated into the U.S. Coast Pilot, the Coast Guard Vessel Traffic Service (VTS) Manual and the San Francisco Bar Pilots Operations Manual.

During 2007-2009:

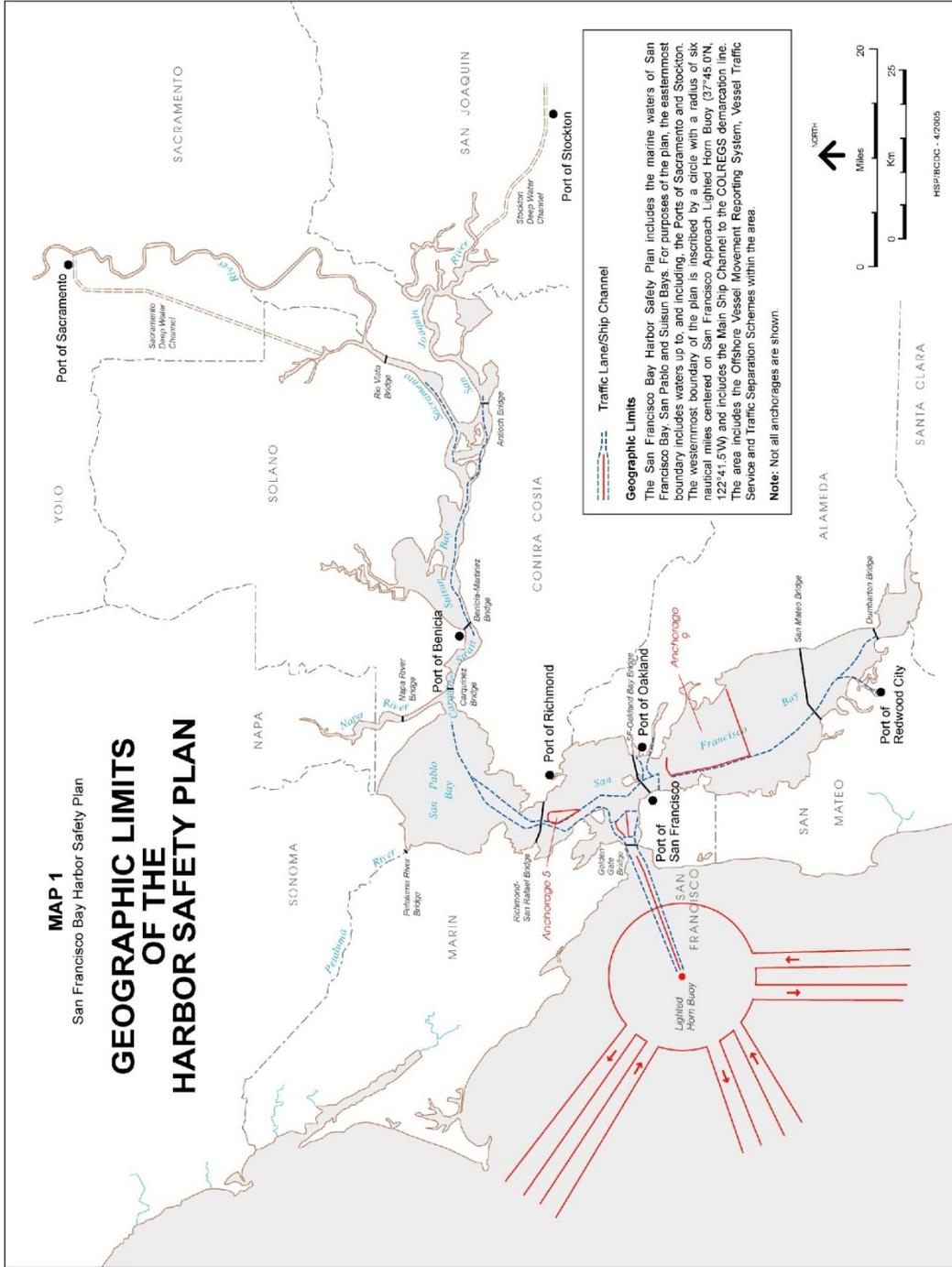
- The Tug Escort Work Group analyzed the Cosco Busan allision relative to tug operations, concluding there was no current evidence that tug escorting would have prevented the allision or similar incidents from occurring. The Work Group developed Best Maritime Practices for the use of simulator training for emergency tug escort response, for tugs with tows operating in reduced visibility and for operating during severe weather conditions. The Work Group also updated the Escort Plan document used by tankers for the Master/Pilot exchange prior to entering the Bay.

- The Navigation Work Group analyzed a number of components in the Governor’s directive – speed limits, crew staffing requirements and Vessel Traffic Service authority over ship movements. In addition, the Work Group developed Best Maritime Practices for large vessels over 1600 gross tons operating in reduced visibility and in severe weather conditions and for enhanced training for licensed pilots in advanced electronic navigation systems. The Work Group worked with the Tug Escort and Ferry Operations Work Groups to craft similar guidelines for other vessels in the Bay.
- The Ferry Operations Work Group for commute ferries established a maneuvering zone radius for the San Francisco Ferry Building ferry terminals and a maneuvering zone protocol; agreed upon communication protocols en route; and identified and produced maneuvering routes for nautical charts. The Work Group developed Best Maritime Practices for commute ferries operating in reduced visibility and in severe weather conditions.
- The Prevention Through People Work Group continued distribution of ‘Kayakers, Be Alert!’ safety materials, updated the “Where the Heck is Collinsville?” brochure and, with the VTS, designed a poster about hoax “Mayday” calls at the request of the Coast Guard. In addition, the Harbor Safety Committee adopted the previously produced communication protocol for safe bunkering operations alongside cargo vessels as part of the Best Maritime Practices Program.
- The Physical Ocean Real Time System (PORTS) Work Group obtained funding, which continued the system’s administration by the Marine Exchange. Additional funding was obtained from Tesoro to purchase and install a current and MET sensor on the Avon Wharf. Installation of additional PORTS sensors was begun as state funds became available to support deep draft vessel navigation, the commute ferry system and the marine community. PORTS completed re-activation and equipment upgrades as new funding became available.

## I. Geographic Boundaries

The policies and recommendations contained in the San Francisco Bay Harbor Safety Plan address vessel safety in the marine waters of the San Francisco, San Pablo and Suisun Bays, up to and including the Ports of Sacramento and Stockton, which establish the eastern boundary of the plan area. 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) and includes the Main Ship Channel to the COLREGS demarcation line (see map opposite). This includes the Offshore Vessel Movement Reporting System, Vessel Traffic Service and Traffic Separation schemes within the area. NOAA charts 18649-18663 cover the Harbor Safety Plan Area.

*(See map following page.)*



## II. General Weather, Currents And Tides

The majority of the background information presented here is derived from the National Weather Service and can be viewed in its entirety in the *U.S. Coast Pilot, Pacific Coast*, published by NOAA and available from the following website: <http://nauticalcharts.noaa.gov/nsd/cpdownload.htm>. The *Coast Pilot* information 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 current conditions to navigate safely.

### Weather

Bay Area weather is seasonably variable with three discernible seasons affecting the marine environment. The Bay Area has several climate regimes, or microclimates. Significant differences in temperature, winds, and fog patterns over relatively short distances are due to variations in air mass between land and sea and to the complex terrain of the coastal mountain ranges. Wind direction is generally west to east; however, there is a great deal of variation due to the complex geography.

Because of the many microclimates of the San Francisco Bay Area, mariners who navigate the waters from outside the Golden Gate, through the San Francisco Bay and Delta and into the Central Valley must be aware of how weather conditions can change significantly over short distances and over short periods of time. Mariners must also be aware of the unique weather conditions and weather hazards that are most prevalent during each season.

### Winds

**Winter.** Winter is the season with the most significant seas, both in terms of locally driven wind waves as well as open ocean swells that are generated by long fetches of strong winds over the eastern Pacific. 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 15 to 40 percent of the time inside the Bay and 10 to 12 percent 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.

Seas are sometimes large enough to produce breakers across the San Francisco Bar, several miles west of the Golden Gate. These breaking waves in the open ocean present a significant danger to mariners, especially those unfamiliar with the area. Breakers across the bar are most common with a long period westerly swell around the time of maximum ebb current through the Golden Gate.

**Spring.** Spring is generally the windiest season, with average speeds in the Bay of 6-12 knots, with wind speeds of 17-28 knot winds up to 40 percent of the time. Wind speeds sometimes reach gale force over the coastal waters outside the Golden Gate, and approach gale force locally in northern San Francisco Bay. 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.

Strong springtime winds over the coastal waters produce rough and choppy seas with a short period swell. The large long-period swells that are common during the winter months still roll through the coastal waters quite often during the early spring, but taper off considerably by late spring as the storm track across the Pacific becomes less active.

**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 this happens a Northeast flow develops, bringing warm dry air and clearing away the summer fog.

Small craft advisory conditions (20 to 25 knots ) occur nearly every day in summer through the central and northern San Francisco Bay and eastward through the Carquinez Strait. Wind speeds sometimes locally reach 30 knots in these areas. Gales are rare in summer, but can occur during an unusually intense onshore push.

During the summer months, seas in the coastal waters are mostly generated from local winds and therefore have a short period and tend to be choppy. Large, long-period swells from the open ocean contribute much less to the overall wave height than during the late fall to early spring time frame.

### **Safety Considerations in Severe Weather: Large Vessels and Tugs with Tows 1600 Gross Tons or Greater**

Extreme wind conditions occasionally require the San Francisco Bar to be closed to vessel traffic. The following best practices apply to large vessels of 1600 gross tons or more and to tows with tugs of 1600 gross tons or more. They are meant to serve as guidelines, and are not meant to relieve the mariner of his or her responsibility to follow applicable rules and regulations addressing prudent seamanship.

**Factors to consider when closing the Bar or limiting transits in the Bay.** A number of factors must be considered when limiting transits in the Bay or closing the Bar due to severe weather, including sea state, tidal influences, visibility, traffic density, and wind advisories issued by NOAA. The size, class and condition of the vessels being addressed must also be considered. The HSC recommends a tiered approach, applying greater caution as conditions worsen.

#### ***Sustained winds exceeding 25 knots in the Bay***

- Vessels should closely evaluate whether it is safe to transit in the Bay. Size, class and sail area of the vessel, tidal influences, visibility, and traffic density should all be considered.
- VTS San Francisco will establish regular communications with bridge watches of VTS users in Bay Area anchorages, and more closely monitor swing circles to ensure vessels are not drifting.

#### ***Sustained winds exceeding 40 knots in the Bay***

- Transits to and from berths are not recommended.

#### ***Sustained winds exceeding 40 knots and/or seas exceed 12 ft at the Sea Buoy***

- Bar traffic restrictions and closure should be considered. Size and class of the vessel, draft, swell period, tidal influences, visibility, and traffic density should all be considered. Strong ebb tides should be avoided, and a minimum of 10 feet under-keel clearance is recommended.

#### ***Procedures for Closing the Bar or Restricting Bar Traffic***

- Bar closures are exercised on a situational basis without specifically defined weather or security conditions.

- The most recent San Francisco Bar Pilot over the Bar, inbound or outbound, shall make the recommendation to the dispatcher that the Bar should be considered for closure, or traffic limited to one-way traffic.
- In the event that the station boat is “boarded off,” then the station boat captain will make the recommendation to the dispatcher.
- The dispatcher will then notify the Operations Pilot, who will notify the Port Agent.
- The Operations Pilot or Port Agent will then notify the U.S. Coast Guard VTS and Command Duty Officer at the Sector San Francisco Command Center.
- The Captain of the Port will consult with the Operations Pilot or Port Agent prior to closing the bar under Captain of the Port authority. The Coast Guard will then issue a Marine Safety Broadcast communicating the closure or traffic restriction.
- The procedure for lifting traffic restrictions or re-opening the Bar will be the same as that for restricting traffic or closing the Bar.
- Vessels under Federal Pilotage or Public Vessel may petition the Captain of the Port to transit the San Francisco Bar.

### **Safety Considerations in Severe Weather: Tugs with Tows Less Than 1600 Gross Tons**

The winter months from November to February typically bring storm systems to the Bay area that result in high winds and adverse sea conditions. Extreme wind conditions of 50 knots gusting to 75 knots have occurred during the winter, occasionally requiring the San Francisco Bar to be closed to tug and tow traffic.

These best practices are meant to serve as guidelines, and are not meant to relieve the mariner of his or her responsibility to follow applicable rules and regulations addressing prudent seamanship. Furthermore, they are designed to address vessels in the service of routine cargo transport, and are not meant to prohibit tug rescue or salvage operations.

**Factors to consider when closing the Bar or limiting transits in the Bay.** A number of factors must be considered when limiting transits in the Bay or closing the Bar due to severe weather, including sea state, tidal influences, visibility, traffic density, and wind advisories issued by NOAA. The size and condition of the vessels being addressed must also be considered. The Tug Escort Work Group recommends a tiered approach, applying greater caution as conditions worsen.

#### ***Sustained winds exceeding 25 knots in the Bay***

- Tugs with tows should closely evaluate whether it is safe to transit in the Bay. Size and sail area of the vessel, tidal influences, visibility, operator skill and traffic density should all be considered.

- VTS San Francisco will establish regular communications with bridge watches of VTS users in Bay Area anchorages, and more closely monitor swing circles to ensure vessels are not dragging.

***Sustained winds exceeding 40 knots in the Bay***

- Transits to and from berths are not recommended, but may be performed following a careful risk management evaluation by the vessel operator and vessel management.

***Sustained winds exceeding 40 knots and/or seas exceed 12 ft at the Sea Buoy***

- Bar traffic restrictions and closure should be considered for tugs and tows. Size of the vessel, draft, swell period, tidal influences, visibility, and traffic density should all be considered. Strong ebb tides should be avoided, and a minimum of 10 feet under-keel clearance is recommended.

**Fog**

Fog is a common occurrence in the Bay Area, particularly around the Golden Gate. It is most frequent during the summer, occasional during fall and winter, and infrequent during spring. Although daily and seasonal fog cycles are predictable, long-term fluctuations are not. 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 and the large expanse of bays and a major river system. Depending on the location, an area may experience high, dense or relatively little fog. The following is a brief summary of fog conditions in the Bay.

**Winter.** Winter fogs are usually radiation fog or “tule” fog. With the clear skies and light winds of winter, land temperature drops rapidly at night. In low, damp places such as the Delta and Central Valley (where tules and marsh plants grow), an inversion develops over the inland valleys. Widespread radiation fog will then develop if the surface is sufficiently moist (e.g., after soaking rains). Tule fog is notoriously thick and dense.

In the winter months from late November to early March, fog can develop in the Valley overnight. Visibilities often fall to near zero in the Delta, southern Sacramento Valley, and northern San Joaquin Valley, making marine navigation in these areas difficult. Lowest visibilities occur late during the night through mid-morning hours. Visibilities improve by late morning and often the fog layer lifts into a low overcast during the afternoon.

Sometimes, if there is a light offshore flow during a tule fog event, dense fog can drift westward from the Delta through the Carquinez Strait and into San Francisco Bay. Visibilities can drop below 0.5 mile and stay below 0.5 mile for many hours, and in worst cases, several days. 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 one knot.

**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 process forms an inversion layer at 500-1500 feet, where the air is warmer at this level than the air below it. 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 rises, a local low pressure creates a steady onshore wind. 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 northern 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 strong enough to carry the sea fog as far east as Sacramento and Stockton. If this continues for a number of days, cooler ocean air replaces the warm valley air and causes the sea breeze mechanism to break down. Winds then diminish and the Bay Area clears for a few days; the valley then slowly reheats and the cycle begins anew.

### **Safety Considerations in Reduced Visibility**

Navigating the San Francisco Bay Region during periods of reduced visibility requires mariners to exercise additional caution and vigilance. The Bay region is one of the foggiest harbors in the United States. In-Bay distances are long. There is not a single regional climate, but a series of microclimates with variable fog. During summer, 30 to 40 percent of parts of the Bay may experience foggy conditions. In winter, the fog is generally denser tule fog.

Dense fog is defined by the National Weather Service as fog that reduces visibility to one-half mile or less on the San Francisco Bay or to one mile or less over the coastal waters. Spring and summer fog is not usually dense over the bays and into the Delta and Central Valley. However, fog can often be dense over the coastal waters when the marine layer is shallow (typically less than 1000 feet deep). During shallow marine layer

scenarios, the coastal mountains act as a barrier blocking fog and low clouds from moving inland. Even with a shallow marine layer, fog can still advect into the Bay through the Golden Gate. In this situation, dense fog is almost always limited to local sections of the San Francisco Bay, primarily from the Golden Gate to Berkeley.

**Large Vessels and Tugs with Tows 1600 Gross Tons or greater.** The following guidelines should be used by the mariner when planning, initiating or navigating a transit in the Bay during periods of reduced visibility. These guidelines acknowledge that large vessels are not as maneuverable as smaller vessels and therefore define “Large Vessels” as power driven vessels of 1600 gross tons or more, and tugs with tows of 1600 gross tons or more. Mariners are at all times to comply with the requirement of the International Regulations for Avoiding Collisions at Sea, or COLREGS.

**Critical Maneuvering Areas (CMAs).** There are areas within the Bay where additional standards of care are required due to the restrictive nature of the channel, proximity of hazards, or the prevalence of adverse currents. Large vessels should not transit through CMAs when visibility is less than 0.5 nautical miles.

Locations within the Bay identified as Critical Maneuvering Areas:

Redwood Creek

San Mateo-Hayward Bridge

Oakland Bar Channel\*

Islais Creek Channel

Richmond Inner Harbor

Richmond-San Rafael Bridge, East Span

Union Pacific Bridge

New York Slough, up-bound

Rio Vista Lift Bridge

\*Note: the Oakland Bar Channel is identified due to cross currents and its proximity to the Bay Bridge and Yerba Buena Island.

**Vessels docked:** Large vessels at a dock within the Bay should not commence a movement if visibility is less than 0.5 nautical miles at the dock.

**Vessels proceeding to dock:** Large vessels proceeding to a dock should anchor if visibility at the dock is known to be less than 0.5 nautical miles, unless, under all circumstances, proceeding to the dock is the safest option.

**Tugs with Tows less than 1600 Gross Tons.** These best practices should be used by the mariner when planning, initiating or navigating a transit in the Bay during periods of reduced visibility. They acknowledge that the size of a tug and tow have much to do with their maneuverability, and therefore, are limited to tugs with tows with a displacement of less than 1600GT. Finally, the best practices are meant to serve as guidelines, and are not meant to relieve the mariner of his or her responsibility to follow applicable rules and regulations addressing prudent seamanship including the requirement of the International Regulations for Avoiding Collisions at Sea, or COLREGS.

**Critical Maneuvering Areas (CMAs):** The areas within the Bay where additional standards of care are required due to the restrictive nature of the channel, proximity of hazards, or the prevalence of adverse currents, are listed above. Tugs with tows less than 1600GT should not transit through CMAs when visibility is less than 0.25 nautical miles. Tugs with tows in petroleum service should not transit through CMAs when visibility is less than 0.5 nautical miles.

Locations within the Bay identified as Critical Maneuvering Areas:

Redwood Creek

San Mateo-Hayward Bridge

Oakland Bar Channel\*

Islais Creek Channel

Richmond Inner Harbor

Richmond-San Rafael Bridge, East Span

Union Pacific Bridge

New York Slough, up-bound

Rio Vista Lift Bridge

\*Note: the Oakland Bar Channel is identified due to cross currents and its proximity to the Bay Bridge and Yerba Buena Island.

**Vessels docked:** Tugs with tows less than 1600GT at a dock within the Bay should not commence a movement if visibility is less than 0.25 nautical miles at the dock. Tugs with tows in petroleum service at a dock within the Bay should not commence a movement if visibility is less than 0.5 nautical miles at the dock.

**Vessels proceeding to dock:** Tugs with tows less than 1600GT proceeding to a dock should anchor if visibility at the dock is known to be less than 0.25 nautical miles, unless, under all circumstances, proceeding to the dock is the safest option. Tugs with tows in petroleum service proceeding to a dock should anchor if visibility at the dock is known to be less than 0.5 nautical miles, unless, under all circumstances, proceeding to the dock is the safest option.

Vessel pilots or operators should notify VTS upon determination that a scheduled movement will be delayed or cancelled. If underway, they shall make a sailing plan deviation report per VTS regulations. The operator's local knowledge should include an understanding of historic weather patterns during that time of year, current weather reports and checking with reporting stations along the route. This guidance acknowledges that the Bay region is a series of bays and rivers, in-Bay distances are long and there is not a single Bay region climate, but a series of many microclimates with variable fog. 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. The National Weather Service broadcasts marine weather information on VHF WX 1,2,3, and 4.

## **Currents And Tides**

### **Currents**

The currents at the entrance to San Francisco Bay are variable and can attain considerable velocity. Immediately outside the Golden Gate 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 northern 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 northern 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 knots for the ebb.

**In-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 Rivers.

## **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), or 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 Considerations Associated with Current and Tide Conditions.** In late 1991, the National Oceanic and Atmospheric Administration (NOAA) stopped publishing the local tidal current charts due to significant errors in predictions that exceeded NOAA standards. Because safe navigation is highly dependent upon accurate tidal and current information, the Physical Oceanographic Real Time System (P.O.R.T.S.) was installed to give near-real time tide and current data updated every six minutes. P.O.R.T.S. is managed by the Marine Exchange of the San Francisco Bay Region (SFMX) with technical assistance from NOAA/NOS. Consistent funding is still to be identified for long term operation of the system in the Bay.

P.O.R.T.S 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.

Data from the sensors is collected and subject to automatic preliminary quality control at the Data Acquisition System (DAS) located at the SFMX. The data is quality-tested 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’s National Ocean Service headquarters in Silver Spring, Maryland, who monitor the data quality and sensor performance using data quality control tests and remote sensor and DAS diagnostics.

Management of P.O.R.T.S., including administration, field maintenance and repair and the DAS, was handed over to the SFMX, located at Lower Fort Mason Center in San Francisco. The P.O.R.T.S. Advisory Workgroup is studying various funding options in order to continue operating the system, and has made a recommendation to request general State funding.

Access to P.O.R.T.S. information may be obtained by logging onto the SFMX website at [www.sfm.org](http://www.sfm.org) or by contacting the automated voice response number: (866) 727-6787.

### **Marine Weather Services**

The National Weather Service (NWS), a part of the National Oceanic and Atmospheric Administration (NOAA), provides marine weather warnings and forecasts to serve all mariners who use the waters for livelihood or recreation. The warning and forecast program is the core of the NWS's responsibility to mariners. Warnings and forecasts help the mariner plan and make decisions protecting life and property. The NWS also provides information through weather statements and outlooks that supplement basic warnings and forecasts. The following are the basic marine warning products the NWS offers:

**Small Craft Advisory:** Forecast winds of 22 to 33 knots and/or hazardous sea conditions (usually seas greater than 10 feet).

**Gale Warning:** Forecast winds of 34 to 47 knots.

**Storm Warning:** Forecast winds of 48 knots or higher.

**Dense Fog Advisory:** Visibility reduced to one-half mile or less in the bay. Visibility reduced to one mile or less in the coastal waters.

**Special Marine Warning:** Potentially hazardous over-water events of short duration (two hours or less) such as thunderstorms with strong gusty winds.

Advisories and warnings listed above are headlined in the Coastal Waters Forecast (CWF). In addition to headlining hazardous weather conditions, the CWF includes forecast information on wind speed and direction, waves, swell, and significant weather (including fog, rain or showers, and thunderstorms). Beginning in March 2006, NWS San Francisco Bay Area began issuing a specific forecast for the San Francisco Bar as part of the Coastal Waters Forecast (CWF) product. The bar forecast includes expected sea state conditions for the next two periods (e.g., tonight and tomorrow), times of maximum ebb current through the Golden Gate and across the bar, and expected hazards such as a small craft advisory for hazardous bar conditions and/or breaking waves on the bar. The bar forecast is updated four times a day along with the rest of the CWF.

### **Marine Warning and Forecast Dissemination**

Marine weather observations, forecasts, and warnings are disseminated through a wide variety of methods, including those listed below.

**NOAA Weather Radio (NWR):** The NWR network provides voice broadcasts of coastal marine forecasts on a continuous cycle. Broadcast coverage extends across the bays and typically offshore about 25 nautical miles. When severe weather threatens, an alarm tone is sent to automatically turn on compatible NWR receivers in the transmitter's coverage area. Transmitters that broadcast in the San Francisco Bay Area include:

<b>Frequency</b>	<b>Call Sign</b>	<b>Location</b>
162.400 MHz	KHB-49	San Francisco (Mt. Pise)
162.500	KDX-54	San Francisco North Bay Marine (Big Rock Ridge)
162.550	KEC-49	San Jose/Monterey (Mt. Umunhum)
162.450	WWF-64	San Jose/Monterey Marine (Mt. Umunhum)
162.425	KZZ-75	East Bay/Delta (Mt. Diablo)

### **The Internet**

- National Weather Service San Francisco Bay Area: [weather.gov/sanfrancisco](http://weather.gov/sanfrancisco)
- NWS San Francisco Bay Area marine forecast web page:  
[www.wrh.noaa.gov/mtr/marine.php](http://www.wrh.noaa.gov/mtr/marine.php)
- Point and Click Marine Forecast: The NWS now offers the opportunity to get a site-specific forecast instead of relying on a zone forecast:  
[www.wrh.noaa.gov/firewx/fwpfm/fwpfm.php?wfo=mtr&interface=marine](http://www.wrh.noaa.gov/firewx/fwpfm/fwpfm.php?wfo=mtr&interface=marine)  
By selecting any spot on the interactive map, the web page user will receive a forecast table that will include specific information on winds, waves, swells and other parameters for the next seven days.
- Buoy and Coastal Observation Information: Wind and wave data from offshore buoys, as well as other coastal weather observations, can be found at:  
[www.wrh.noaa.gov/mtr/buoy.php](http://www.wrh.noaa.gov/mtr/buoy.php)

Buoys data can also be obtained over the phone using the National Data Buoy Center's "dial-a-buoy" service: 1-888-701-8992.

Use the buoy number below when prompted to access the latest buoy observations.

<b>Buoy #</b>	<b>Lat/Long</b>	<b>Location</b>
46013	38.2N/123.3W	Bodega Bay
46026	37.8N/122.8W	San Francisco
46012	37.4N/122.9W	Half Moon Bay
46042	36.8N/122.4W	Monterey
46237	37.8N/122.6W	San Francisco Bar

### III. Aids To Navigation

The waters of the San Francisco Bay Area are marked to assist navigation by the U.S. Aids to Navigation System. This system encompasses buoys and beacons conforming to the International Association of Lighthouse Authorities. The U.S. 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*.

Aids to navigation in the Bay region are regularly reviewed. These reviews, known as the Waterway Analysis and Management System Studies (WAMS), are conducted by the U.S. Coast Guard with input from pilots and other waterway users. One of the results of these reviews was the establishment of new precautionary areas in the Central Bay and its approaches. (The prior traffic routing scheme, originally established in 1972, corrected the problems of contrary vessel movements in the Bay at that time.) The revised traffic routing scheme established a deep water traffic lane and a precautionary area between the Main Ship Channel traffic lanes and the Deep Water Traffic Lane (DWTL). It also established the Central Bay traffic lanes and expanded the associated precautionary areas. The northern traffic lanes were redesigned and the separation zones in the channel deleted. The Coast Guard also established Regulated Navigation Areas (RNAs) for San Francisco Bay and the ship channels of Oakland Harbor, Richmond Harbor/Southampton Shoal Channel, North Ship Channel, Pinole Shoal Channel and the channel under the Union Pacific Railroad Bridge in the Carquinez Strait.

Lighted buoys mark many of the major rocks near shipping channels in the Bay. A lighted buoy and a racon (radar beacon) mark Harding Rock, a submerged rock near the DWTL northwest 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. However, 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.

In addition to the hazards posed by rocks both above and below the water, area bridges create an additional challenge when navigating the Bay. There are racons on most bridges in the Bay Region. This is of major importance because racons are invaluable for 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. With racons placed on the center span of bridges, the mariner can determine the center of the bridge span, even in limited visibility. The Harbor Safety Committee continues to emphasize the importance of racons on bridges.

## IV. Anchorages

Due to 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. See 33 CFR 110.224 for regulations governing anchorages in the San Francisco Bay region. The regulations can be found on the web in the Code of Federal Regulations at [www.gpoaccess.gov](http://www.gpoaccess.gov).

Anchorage 9 is the only anchorage designated by the U.S. Coast Guard Captain of the Port where lightering of tankers and bunkering of vessels is allowed. 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 Anchorage 9, was realigned in 1997 to provide deeper water in order to allow vessels laden with explosives, and with drafts of 38 feet or greater, to safely anchor. This also minimized potential overcrowding of vessels anchored within the northern portion of Anchorage 9. 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 laden with explosives within the Anchorage.

It was recommended that the USCG adopt pre-designated anchorage areas within the existing general anchorages throughout the VTS SF area, and in particular within General Anchorage 9, in order that safer and more disciplined anchoring practices may be managed by VTS SF, with due consideration for pilot and vessel master concerns. The final resolution was to divide the Anchorage into two areas: the western side is designated for deep-draft vessels and the eastern side for lighter-draft vessels. In addition, VTS requires that vessels not anchor closer than 750 yards from one another.

## V. Surveys, Charts And Dredging

The rivers and streams that empty 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 controlled in order to accommodate deep-draft vessels. 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. Maintenance dredging accounts for approximately 5,000,000 cubic yards of sediments dredged from the San Francisco Bay, Sacramento and San Joaquin ship channels annually.

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. However, continual sedimentation flowing out of the river systems into the ocean reduces the Main Ship Channel from its authorized depths. According to the U.S. Army Corps of Engineers (CoE), there are no current plans to change the entrance channel's authorized width or depth. 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 several shoals and reduced rocks near Alcatraz Island. There are a number of federally dredged channels in the Bay, some of which are narrow. For example, Pinole Shoal is 600 feet wide and the Stockton Main Ship Channel is 200 feet wide. Bay Area ports and channels are maintained to various authorized project depths. (Consult the latest *Coast Pilot* or NOAA charts.)

Deep-draft vessels in the Bay are often constrained to navigate only within the main shipping channels. Groundings have been reported in many areas of the region, in part due to the narrow width of many of the channels. Groundings can result in damage to vessels and property, with the potential for serious environmental consequences. A ship aground in a channel can block the transit of other vessels or create new shoaling, and may cause serious delays to Bay commerce. Maneuvering deep-draft ships in narrow channels with minimal underkeel clearance poses high navigational risks, given the complexities of tides, currents and weather conditions in the Bay.

## Surveys

Surveys provide information on actual channel depths, reducing the risk of vessel groundings. The frequent shoaling and silting in the channels of San Francisco Bay and its tributaries require channel surveys to be conducted on a routine basis. Emergency surveys should be conducted when there is evidence that shoaling has occurred. Due to seasonal shoaling, some areas are surveyed on a more frequent basis. Even charts based on modern surveys may not show all seabed obstructions or shallow areas due to localized shoaling.

The variable hydrodynamics of the Bay estuary are due to a number of factors such as drought and flood cycles, dredging projects and in-Bay dredge disposal that may affect navigation channels. Strong seismic events may alter the bottom topography of 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, affecting sediment accretion.

Accumulation of disposed dredged material at the disposal site near Alcatraz Island resulted in the need for a new approach to dredged material management, leading to adoption of the Long Term Management Strategy (LTMS) for the placement of dredged material in the San Francisco Bay region by the state and federal agencies that regulate dredging and disposal. The LTMS provides the basis for uniform federal and state dredged material disposal policies and regulations, with a focus on minimizing in-bay disposal of dredged material.

## Charts

NOAA's Office of Coast Survey (CS) designed a 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.

**Raster Chart Products:** NOAA has been active in developing electronic charts products. NOAA's entire suite of 1,000 nautical charts is available in raster format from nautical chart agents. 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 available nationwide from contractors that are listed on the NOAA website: <http://nauticalcharts.noaa.gov>. The POD allows CS to update charts immediately and electronically transmit the updated information to users. ( means for the user to update raster charts is being investigated. 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.

<b>San Francisco Bay NOAA Nautical Charts</b>			
	<b>Chart Number</b>	<b>Chart Scale</b>	<b>Chart Title</b>
1	18640	1:207,840	San Francisco to Point Arena
2	18645	1:100,000	Gulf of the Farallones
3	18649	1:40,000	Entrance to San Francisco Bay
4	18650	1:20,000	S.F. Bay: Candlestick Pt. to Angel Island
5	18651	1:40,000	S.F. Bay: Southern Part
6	18652	1:80,000	Small Craft Chart: S.F. Bay to Antioch
7	18653	1:20,000	S.F. Bay: Angel Island to Pt. San Pedro
8	18654	1:40,000	San Pablo Bay
9	18655	1:10,000	Mare Island Strait
10	18656	1:40,000	Suisun Bay
11	18657	1:10,000	Carquinez Strait
12	18658	1:10,000	Suisun Bay: Roe Island and Vicinity
13	18659	1:10,000	Suisun Bay: Mallard Island to Antioch
14	18660	1:40,000	San Joaquin River, Antioch to Medford I
15	18661	1:40,000	Sacramento and San Joaquin Rivers
16	18662	1:40,000	Sacramento River
17	18663	1:20,000	Stockton Deep Water Channel
18	18664	1:20,000	Sacramento to Colusa
19	18680	1:210,668	Point Sur to San Francisco

**Vector-Based Charts:** NOAA is building a database to produce an accurate and detailed vector electronic navigational chart (ENC) for major U.S. ports and shipping lanes. The vector charts 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. The ENCs for the SF Bay region are compiled and available online at <http://nauticalcharts.noaa.gov>.

**Hydrographic Surveys:** NOAA contracted for hydrographic surveys in the Bay in April 1999. Updates are continuously made by NOAA's Navigation Response Team and contract surveys.

### **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 MLLW. The submerged rocks are within the westbound traffic lane that passes north of Alcatraz Island and is designated for large vessels over 1,600 tons drawing 28 feet or less outbound to sea. Most inbound vessels sail south of Alcatraz Island; however, ships with a draft of more than 45 feet sail north of Alcatraz in the deep water traffic lane in order to maintain safe depths in the deeper waters within this area. Blossom Rock is 40 feet below the surface of the water at MLLW and is located approximately one nautical mile to the southeast of Alcatraz Island, posing a potential hazard to navigation for deep-draft vessels transiting Central San Francisco Bay. Harding, Arch, Shag and Blossom Rocks were lowered many 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.

The San Francisco Central Bay Rock Removal Project was initiated in April 2000 to review potential actions to prevent groundings on these rocks. Removing this hazard would significantly reduce the possibility of a major oil spill resulting from a vessel striking one of the mounds. Although there are other obstructions to navigation within the Bay, these rock mounds are especially dangerous due to their close proximity to the confined shipping lanes.

The U.S. Army Corps of Engineers (CoE), working with the Harbor Safety Committee's Underwater Rocks Work Group and the California State Lands Commission, investigated the economic and environmental feasibility of lowering the rock mounds to depths required for deeper draft vessels. After more than two years of study, the CoE concluded that with current shipping practices in place that are designed to ensure the safe passage of vessels within the Bay, the probability of a vessel actually grounding on the rocks became extremely remote. Non-structural measures (e.g., aids to navigation, tug support, emergency response) are regularly evaluated under the overall navigation safety mission of the Harbor Safety Committee. The low probability of occurrence, when applied to the potential damages that could result from a spill, reduced the project benefits well below the cost to lower the rocks. Therefore, the CoE determined there was not a federal interest in physically lowering some or all of the rocks.

## VI. Contingency Routing

Dredging and construction may impact the routing of vessels in the Bay. 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 various ports have taken place to accommodate the modern deep-draft vessels.

The six major bridges that span San Francisco Bay shipping lanes require regular maintenance of bridge fender systems. In addition, there are projects to strengthen the supports of several bridges for the purpose of seismic safety. Maintenance and construction work on the bridges often impacts navigation lanes.

During the many stages of a dredging or construction project that might impact the navigation of vessels, the project proponent and managers consult with pilots, vessel operators, the U.S. Coast Guard, affected port authorities and appropriate agencies. This ensures that consideration is given to the safety of navigation and any restrictions that may impact the movement of vessels.

The USCG Vessel Traffic Service (VTS SF or VTS) has authority under the Ports and Waterways Safety Act to direct vessel movement in case of emergency to ensure the safety and security of the Port. The Captain of the Port has authority to create Safety Zones and to regulate vessel traffic in the event of an oil spill, disaster or emergency.

**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.

**Contingency Routing.** Cooperation and consultation between pilots, the USCG, 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. To reduce the risk of accidents occurring during harbor construction, dredging and waterway modification projects, the long-standing permitting procedures of the U.S. Coast Guard, the San 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 are responsible for informing the USCG in advance of their planned and actual construction so that the USCG 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.

The Oakland -50 foot deepening project is scheduled to be completed during the spring of 2009. The contractor working on this project sends weekly status reports to VTS SF, the S.F. Bar Pilots, the USCG Marine Safety Office and the Army Corps of Engineers.

Additionally, project planning and construction are underway for seismic retrofitting of various major bridges in San Francisco Bay. These seismic retrofit activities will affect mariners on a daily basis for several years. The Coast Guard, with input from the Harbor Safety Committee, has worked with CalTrans, bridge owners and contractors to develop guidelines for construction activity on the bridges. Sector San Francisco, VTS and S.F. Bar Pilots will continue to 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 VTS 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 provides information about bridge activities via telephone, letter, Local Notice to Mariners and Broadcast Notice to Mariners as appropriate. Mariners are reminded that heavy rain and high winter flows may result in reduced vertical and horizontal navigational clearances under bridges. Flotsam and drift may accumulate at bridge piers and abutments. Mariners should approach all bridges with caution and due consideration to existing navigational conditions. Notification of bridge-related discrepancies should be provided to the VTS via marine radio or telephone to ensure appropriate Notices to Mariners are issued.

Construction, retrofit and maintenance activities at bridges involve the use of scaffolds, temporary trestles, and marine construction equipment. (See Appendix L, Vehicular Bridge Inventory.) General information about construction activities is provided in the weekly Local Notice to Mariners. Immediate information is provided by Broadcast Notice to Mariners and VTS advisories. Some projects have special considerations such as minimum wake or scaffolding that reduces vertical clearance. The Local Notice to Mariners and VTS provide contact information to the various work sites, allowing mariners access to timely information. 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 maritime community during essential bridge work is appreciated

## **VII: Vessel Speed And Traffic Patterns**

### **Ship Traffic**

A variety of commercial, military and public vessels enter, exit and transit the Bay. Many vessels such as ferries and tugs remain entirely within the Bay. Container ships, oil tankers and bulk carriers account for the greatest percentage of ship arrivals; however, a broad range of cargo transits the region every year. Other categories of ships include vehicle carriers, break bulk, chemical tankers and passenger ships. Occasionally, surface combatants, submarines and naval auxiliaries such as oil tankers and supply ships transit the Bay. Public vessels often encountered on the Bay include those of the U.S. Coast Guard, the Army Corps of Engineers, NOAA, and the Military Sealift Command.

In order to safely transit the shipping channels to marine oil terminals in the North Bay and Carquinez Strait, some large oil tankers lighter oil to barges or to smaller ships. Lightering is the process of transferring oil from a larger ship tanker into smaller vessels to reduce the draft of the larger tanker. The large tanker can then proceed to a marine terminal and continue discharging the balance of its cargo. Lightering operations in the Bay take place in Anchorage 9 just south of the Oakland-Bay Bridge. The California State Lands Commission provides annual reports of the amount of oil shipped through the region (see Appendices).

### **Speed of Vessels**

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.

In early 1993, the Coast Guard Marine Safety Office San Francisco Bay proposed that maximum speed limits be set for certain vessels in the Bay to improve safe navigation. The Vessel Traffic Service (VTS), in a two-week survey in early 1993, noted three large commercial vessels traveling at speeds between 18 to 20 knots within the Central Bay. These speeds were 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 boats and tugs. During 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 requested the Harbor Safety Committee to formally comment on these findings. 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 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 ahead and half ahead, which may not coincide with an established 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 allow an immediate response to an engine order. It was agreed the maximum speed proposed would apply to an unescorted vessel of 1,600 or more gross tons. 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.

Federal regulation 33 CFR Parts 162 and 165 became effective May 3, 1995 (see Captain of the Port Advisory #05-095 below). These regulations state in part that 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 the southern tip of Bay Farm Island, Alameda and the Union Pacific Railroad Bridge in Benicia. The regulations can be found on the web in the Code of Federal Regulations at [www.gpoaccess.gov](http://www.gpoaccess.gov). This standard also applies to a tug with a tow of 1,600 or more gross tons. 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.

Following the November 7, 2007 allision of the *Cosco Busan* container vessel with the San Francisco-Oakland Bay Bridge, the Navigation Work Group analyzed the facts of the incident to determine if amendments were needed to speed limitations in the Bay to improve navigation safety. After consideration, the Work Group found, and the HSC agreed, that existing speed limitations in San Francisco Bay are adequate.

**COTP Advisory #05-095 (4 May 1995): ENFORCEMENT OF NAVIGATION RULES IN SAN FRANCISCO BAY**

This advisory provides a listing of the major deep-draft channels in San Francisco Bay and adjacent waters which the Captain of the Port considers to be "narrow channels or fairways" within the meaning of the International and Inland Rules of the Road.

Rule 9, in both the International and Inland Rules of the Road, establish requirements for vessels navigating in the vicinity of narrow channels or fairways. Vessels and powerboats less than 20 meters (approximately 65 feet), all sailboats and vessels engaged in fishing shall not impede the passage of a vessel that can safely navigate only within a narrow channel or fairway. Additionally, a vessel shall not cross a narrow channel or fairway if such crossing impedes the passage of a vessel that can safely navigate only within that channel or fairway. The term "shall not impede" means a small craft must keep well clear and not hinder or interfere with the transit of larger vessels. Small craft and fishing vessels shall not anchor or fish in narrow channels if large vessels or barges being towed are transiting.

Coast Guard enforcement efforts, combined with a public education and information program, are further intended to draw public attention to the serious hazards created when smaller vessels impede large vessels. This effort should result in an improved level of navigational safety and reduce the risk of collisions, groundings and their potential consequences.

The Captain of the Port considers the following areas to be "narrow channels or fairways" for the purpose of enforcing the International and Inland Rules of the Road. This list is not all-inclusive, but identifies areas where deep-draft commercial and public vessels routinely operate. Included in this list and marked by an asterisk (\*) are the Regulated Navigation Areas (RNAs) in San Francisco Bay, which were designated in 33 CFR 162 and 165. [May 1995] The regulations can be found on the web in the Code of Federal Regulations at [www.gpoaccess.gov](http://www.gpoaccess.gov).

- a. All traffic lanes and precautionary areas in the San Francisco Bay eastward of the San Francisco Approach Lighted Horn Buoy SF (LLNR 360) to the San Francisco -Oakland Bay Bridge and the Richmond -San Rafael Bridge to include:
- \*1. Golden Gate Traffic Lanes which include the Westbound and Eastbound Lanes west of the Golden Gate Precautionary Area.
  - \*2. Golden Gate Precautionary Area.
  - \*3. Central Bay Traffic Lanes, which include the Deep Water Traffic Lane, The Eastbound Lane (south of Alcatraz Island), and the Westbound Lane (south of Harding Rock).
  - \*4. Central Bay Precautionary Area.
  - \*5. North Ship Channel between North Channel Lighted Buoy "A" and the Richmond -San Rafael Bridge.
  - \*6. Southampton Shoal Channel including the Richmond Long Wharf maneuvering area.

- \*7. Richmond Harbor Entrance Channel and the Point Potrero Reach ending at Point Potrero Turn and including the Turn Basin at Point Richmond.
- 8. Point Potrero Turn.
- 9. Richmond Harbor Channel in its entirety.
- 10. Santa Fe Channel in its entirety.
- \*b. Oakland Harbor Bar Channel including the Outer Harbor Entrance Channel and the Inner Harbor Entrance Channel.
- c. Oakland Outer Harbor.
- d. Oakland Inner Harbor from Inner Harbor Channel Light "5" (LLNR 4670) to, and including, the Brooklyn Basin South Channel.
- e. Alameda Naval Air Station Channel in its entirety.
- f. South San Francisco Bay Channels between the central Bay Precautionary Area and Redwood Creek Entrance Light "2" (LLNR 5180).
- g. Redwood Creek between Redwood Creek Entrance Light "2" (LLNR 5180) and Redwood Creek Daybeacon "21" (LLNR 5265).
- \*h. San Pablo Straight Channel from the Richmond-San Rafael Bridge to San Pablo Bay Channel Light "7" (LLNR 5900).
- \*i. Pinole Shoal Channel in San Pablo Bay between San Pablo Bay Channel Light "7" (LLNR 5900) and San Pablo Bay Channel Light "14" (LLNR 5935).
- j. Carquinez Strait between San Pablo Bay Channel Light "14" (LLNR 5935) and the Benicia-Martinez Highway Bridge.
- k. Mare Island Strait between Mare Island Strait Light "2" (LLNR 6095) and Mare Island Causeway Bridge.
- l. Suisun Bay Channels between the Benicia-Martinez Highway Bridge and Suisun Bay Light "34" (LLNR 6655).
- m. New York Slough between Suisun Bay Light "30" (LLNR 6585) and San Joaquin River Light "2" (LLNR 6670).
- n. Sacramento River Deep Water Ship Channel from Suisun Bay Light "34" (LLNR 6655) to the Port of Sacramento.
- o. San Joaquin River from San Joaquin River Light "2" (LLNR 6670) to the Port of Stockton.

Rules of the Road Enforcement: Timely reporting and enforcement of Rules of the Road infractions promotes safer navigation. Vessel masters, pilots, and operators are encouraged to report incidents, which merit investigation. Reports will be fully investigated and may result in license suspension or revocation proceedings or the assessment of civil penalties.

## VIII: 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, Code of Federal Regulations, Part 4 (46 CFR 4.05-1) as any accidental grounding or unintended strike of a bridge; loss of primary steering or propulsion or associated control system; an occurrence materially and adversely affecting the vessel’s seaworthiness or fitness for service; loss of life; injury beyond first aid; or damages over \$25,000. The regulations can be found on the web in the Code of Federal Regulations at [www.gpoaccess.gov](http://www.gpoaccess.gov). Sector San Francisco provides accident summaries in monthly reports to the Harbor Safety Committee.

**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. Incident reports are designed to include near-collisions, vessels impeding progress of other vessels, and violations of any navigation rules. Categorizing an incident as a “near-miss” is a subjective determination based upon available information.

**Reporting Requirements.** As soon as is practicable, a VTS user shall notify the VTS of any of the following: (1) a marine casualty as defined in 46 CFR 4.05-1; (2) the ramming of a fixed or floating object; (3) a pollution incident as defined in 33 CFR 151.15; (4) a defect or discrepancy in an aid to navigation; (5) a hazardous condition as defined in 33 CFR 160.203; (6) improper operation of vessel equipment required by 33 CFR 164; (7) a situation involving hazardous materials for which a report is required by 49 CFR 176.48; or (8) a hazardous vessel operating condition as defined in 33 CFR 161.2. The regulations can be found on the web in the Code of Federal Regulations at [www.gpoaccess.gov](http://www.gpoaccess.gov).

**Analysis and Actions Taken to Alleviate Accidents.** 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 VTS was established for the Bay region. The VTS system is fully described in a separate chapter.

Major bridges span shipping channels, connecting various populated areas of the Bay. The bridges are important traffic connectors under which large vessels must carefully navigate between spans. Vessels have struck all Bay bridges during the past 25 years, resulting in damage to the vessels and/or the bridges. Radar beacons (racons) have been added to most of the region’s bridges to enhance the vessel operator’s ability to safely navigate between bridge spans in all types of weather.

Sector San Francisco investigates all reported marine casualties occurring in the Bay region meeting the criteria set forth in Title 46, Code of Federal Regulations, Part 4. 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 46 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 can affect a person's Merchant Mariner's License or Merchant Mariner's Document. The regulations can be found on the web in the Code of Federal Regulations at [www.gpoaccess.gov](http://www.gpoaccess.gov).

Civil penalty procedures may be warranted in a situation where a law or regulation has been violated. Civil penalty procedures are the only actions appropriate in 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 is determined to be criminal in nature, such action is reported to and pursued by the U.S. Attorney's Office.

The Harbor Safety Committee has representatives from a broad section of the maritime community and provides a platform for educational efforts and ongoing dialogue. Its work groups and community outreach help to prevent accidents in the Bay. The USCG, NOAA, state agencies, S.F. Bar Pilots, industry and representatives of recreational and environmental groups are all active participants.

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 to 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 HSC 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, the Coast Guard determined that anonymity could not be provided to persons making reports.

The USCG considered a program to address near-misses (or non-reportable near casualties); however, the program was put on hold in November 2002 due to a lack of funding.

## IX. Communication

### Radio Communications

Ship-to-ship and ship-to-shore communication for the maritime community in the San Francisco Bay Area is almost exclusively on marine VHF (very high frequency) radio. The level of usage varies with periods of saturation depending on the time of day and level of vessel traffic. Additional communication modes include telex, fax, internet, cell phones and AIS (Automatic Identification System) messaging.

VHF radio is expected to continue as the primary method for ship-to-ship and ship-to-shore radio communications. Cell phones help to amplify or clarify information that would not normally be passed, or would be limited, over VHF radio. Nonetheless, cell phones are not a substitute for VHF radio as the primary means of communication with and between vessel traffic in the Bay Area.

AIS will help mariners to more quickly identify other vessels thereby reducing the duration and number of radio transmissions.

Please see Chapter XXI for brochures that address radio communication and safe vessel operations available from the San Francisco Marine Exchange.

### Current Usage

CHANNEL	USE
<b>SAN FRANCISCO BAY COMMON FREQUENCY USAGE</b>	
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 Chevron Richmond Long Wharf
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

CHANNEL	USE
	U.S. Coast Guard and public working channel
23A	USCG reserved working frequency for communications between USCG units and other vessels.
7A, 11, 77 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	
9	Westar Marine Services
10	Crowley Marine Services Foss Maritime Company
18A	AMNAV Maritime Services Baydelta Maritime Brusco Tug & Barge Oscar Niemeth Towing SeaRiver Maritime Seaway Towing Company Starlight Marine Services
MARINE OPERATORS	
26, 84, 87	San Francisco
27, 28, 86	Sacramento, Stockton, Delta
VESSEL TRAFFIC SERVICE RADIO COVERAGE	
VTS has complete radio coverage throughout the region on its designated frequencies.	

### Existing Limitations

Due to the many hills in the region that restrict line of sight, VHF Channel 13 has a number of blind spots because of the one-watt transmission limitation on the channel.

### Equipment

1. **San Francisco Vessel Traffic Service (VTS).** VTS communications equipment consists of four remote sites located throughout the region that ensure complete VHF radio coverage of the VTS area.

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

3. **San Francisco Marine Exchange.** The Marine Exchange is located at Fort Mason Center, San Francisco. The Exchange shares the antenna on Mt. Tamalpais with the Bar Pilots. Their communication equipment includes:

A 50-watt transceiver on Channel 10.

A standard transceiver with a local antenna monitoring Channels 13, 14, & 18A.

### **History of VTS Channel**

Due to increasing congestion on Channel 13, the USCG proposed to shift the primary VTS channel to Channel 14. A Harbor Safety Committee Working Group, consisting of persons from various maritime organizations in the Bay Area, also recommended the change, and the Harbor Safety Committee endorsed the Coast Guard's efforts to improve the communication system. On August 15, 1994, the VTS operating channel was changed to Channel 14 VHF and the change has significantly reduced the amount of radio traffic on Channel 13.

### **Marine Exchange Communication System**

The San Francisco Marine Exchange, a non-profit agency that serves as the Clearing House for tug escorting of regulated tankers and barges, has backup battery systems for its computer, phone, and radio systems.

## X. Bridges

The San Francisco Bay Area is crossed by a number of bridges that carry automotive and rail traffic. Most shipping traffic transits through moveable or fixed bridges with adequate vertical clearance for normal passage.

### 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.

### Schedule of Bridge Openings

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

For vessels intending to transit through the Benicia-Martinez Railroad Drawbridge, there is a well established protocol for requesting a lift. Copies of the protocol are available at the VTS website, [www.uscg.mil/D11/vtssf/](http://www.uscg.mil/D11/vtssf/).

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 or as required by drawbridge regulations (Title 33 CFR 117). Communications are considered to be adequate by the local maritime community.

## **Physical Characteristics of Bridges**

When required by the Eleventh Coast Guard Bridge Office, under the provisions of Title 33 Code of Federal Regulations, Part 118, bridges over navigable waterways in the Eleventh Coast Guard District, are lighted and marked as permitted obstructions on the waterway. Standard markings include a range of two green lights marking the center of the bridge, which in the case of drawbridges, will shift from green to red when the drawspan is in anything but the full open-to-navigation position. Bridge piers in or adjacent to the navigational channel may be lighted at night with fixed red lights to identify them as obstructions. When required, bridges are equipped with sound producing devices that are used during periods of reduced visibility.

The region now has 12 Racons mounted on bridges. A racon is a radar sensor (radar beacon) that sends out a radar emission that shows up as a distinctive mark on a ship's radarscope. The racons were installed because there is a high volume of vessel traffic transiting under bridges and the Bay Area has the highest number of foggy days in the nation when visibility is less than one-half mile.

Racons are located on the following Bay Area 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)
- I-80 Crocket-Vallejo (2)

**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:

- 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 revised the RNA to change the name of the bridge to the Benicia-Martinez RR Bridge, added a third visibility checkpoint, and clarified the procedures for downbound vessels that are moored or anchored between the Railroad Drawbridge and New York Point (that intend to transit the RNA once underway).

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.

Asked the Union Pacific Railroad (UPRR) to change the working frequency of the bridge radiotelephone to VHF Channel 13, to allow vessels and bridge operators to communicate directly instead of using Vessel Traffic Service Channel 14. This change went into effect in 2001.

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

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

Evaluated the obstructive character of the bridge under the Truman-Hobbs Act of 1940, a 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 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 problems occurring with the operation of the Benicia-Martinez Railroad Drawbridge, industry, the pilots and the Coast Guard continue to work with the bridge owners via the Benicia-Martinez Railroad Drawbridge Natural Working Group. The working group meets semi-annually to discuss problems with the bridge and to develop solutions. The working group is coordinated by the Bridge Section of the Coast Guard's Eleventh District and is regularly attended by representatives from both the rail and marine industries, as well as Coast Guard Sector 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 training from VTS on the communications protocol to help avoid potential or near-miss situations. The working group created a mishap matrix to track incidents involving the bridge. Both the Coast Guard and UPRR provide information to the matrix, which is used as a problem-solving tool and historical reference.

## **XI. Small Passenger Vessels – Ferries**

Small passenger vessels (ferries) operate year round on San Francisco Bay, San Pablo Bay and their tributaries, carrying nearly six million passengers on 240 transits per day. In total, passenger vessels made up nearly 60 percent of all transits tracked by the San Francisco USCG Vessel Traffic Service (VTS) in that year. Other ferries carry tourists and dinner cruises year round in the Central Bay.

In 2007, the state legislature established the San Francisco Bay Area Water Emergency Transportation Authority (WETA), as a regional agency with responsibility to develop and operate a comprehensive Bay Area public water transportation system and to increase the emergency response capability of waterborne transit. WETA is charged with: consolidating Vallejo and Alameda Ferry services under WETA, consistent with the provisions of a Transition Plan by July 1, 2009; coordinating emergency response activities for water transit services in cooperation with MTC and other agencies, consistent with the provisions of an Emergency Response Plan by July 1, 2009; and increasing regional mobility by adding seven new ferry routes to triple ferry ridership by 2025. The first new ferry route is proposed between South San Francisco's Oyster Point Marina and Oakland's Jack London Square and depending on funding availability will begin service in late 2010.

WETA is committed to using the most environmentally friendly ferries in the nation and setting a national air emissions standard with its fleet of ferries. By the end of 2009 WETA's first four 25 knot vessels will be operating in the Bay Area on existing regular commuter ferry routes and will be available as spare vessels in the event of an emergency. The first, Gemini, was delivered in December 2009 and is being used on the Tiburon and Alameda/Oakland ferry routes.

Because of concerns associated with an increasing number of commuter ferries sharing the Bay with large shipping vessels and recreational boaters, the HSC requested the Ferry Operations Work Group develop an approach and maneuvering scheme in the vicinity of the congested San Francisco Ferry Building, as well as a routing protocol in the Central Bay to decrease the risk of collision for commute ferries. The routing was adopted by the HSC in 2008, and is included at the end of this chapter.

### **Small Passenger Vessel Services**

Small passenger vessels are defined as less than 100 gross tons that are inspected and certified by the U.S. Coast Guard to carry passengers for hire. "T" vessels carry fewer than 149 passengers, "K" vessels carry more than 149 passengers. One "H" vessel (larger than 100 gross tons) is based in San Francisco.

**Note:** This overview is meant to describe larger private and public vessel operators and does not include the sport fishing or smaller vessel operators that meet the definition of small passenger vessel.

**Ferry:** Regularly scheduled, operate year round, and provide point-to-point service.

**Regularly-Scheduled and Excursion:** Seasonal and year round scheduled service, including sightseeing tours, dining, and/or entertainment.

**Geographical Scope.** Ferry routes bring passengers from outlying cities in the region to the city of San Francisco. Excursion routes operate primarily in the central San Francisco Bay. The following are small passenger vessel terminal locations as of December 31, 2008:

- San Francisco Downtown Ferry Terminal
- Fisherman’s Wharf, San Francisco
- San Francisco China Basin Ferry Terminal
- Larkspur Terminal
- Gateway Alameda
- Clay St. Oakland
- Harbor Bay Isle, Alameda
- Vallejo
- Sausalito
- Tiburon

Small passenger vessels also operate on an unscheduled basis out of marinas in Sausalito, Alameda, Oakland and Berkeley.

### **Small Passenger Vessel Safety Program**

**U.S. Coast Guard San Francisco Vessel Mutual Assistance Plan.** The purpose of the San Francisco Vessel Mutual Assistance Plan (SF V-MAP) is to ensure that a sufficient level of safety exists. It is intended to enhance local capabilities to effectively manage a catastrophic, in port Search and Rescue incident. The objectives of the SF V-MAP are to:

1. Create a “sufficient level of safety” as required by 46 CFR 117.207(f).
2. Provide effective and expedient emergency support by member vessels for a marine search and rescue operation on San Francisco Bay involving a large number of victims or potential victims.

3. Ensure lifesaving equipment available on each member vessel is appropriate for the waters of San Francisco Bay.
4. Promote professionalism in emergency preparedness and response.
5. Provide, through mutual assistance, a more effective and timely means to rescue all persons in the water (PIW).

### **Best Practices**

S.F. Bay Area ferry operators participated in the Harbor Safety Committee Ferry Operations Work Group to develop common best maritime practices for safe passenger vessel operation in the Bay.

**San Francisco Bay Area Ferry Operation in Inclement Weather.** As described in the Harbor Safety Plan, localized microclimates can alter visibility along an entire route or a portion of a route. During summer, channel fog is prevalent in the central San Francisco Bay with outer areas clear. In winter months Tule fog can be widespread, dense in the morning with clearing later in the day.

The Master of a ferry is the person in charge of the vessel, responsible for the safety of the passengers and crew at all times, and has the authority to decide if it is safe to get underway or to proceed.

In reduced **visibility** and **inclement weather conditions**, the following practices are followed:

- A go or no-go decision to get underway is made by the vessel Master or the company Operation Manager, based on conditions along the entire route, using all available information including the experience of the Master and operations manager.
- Look-outs: the vessel Master assigns crewmembers for look-out duty based on the existing or anticipated conditions; the applicable regulations are found in the Navigation Rules and Regulations, Rule 5 Look-out (text attached).
- Safe speed: the vessel is required to proceed at a speed appropriate to the prevailing circumstances and conditions, which include state of visibility and the manageability of the vessel with special reference to stopping distance and turning ability. Other factors include participation in fixed ferry routes, wind advisories issued by NOAA, sea state, traffic density, and applicable Navigation Rules and Regulations (see attached verbiage from Rule 6 Safe Speed).

- Equipment: each ferry is required to have at minimum one radar; commuter ferry vessels generally have two operational radars onboard; the vessel Master is required to have a radar observer license endorsement. Global Positioning Satellite, Automatic Identification System and Electronic Charting navigation systems are also installed and used to assist navigation.

In conditions of **high wind and waves**:

- Go/no-go decision is made by the vessel Master or the company Operation Manager, based on conditions along the entire route, using all available information including the experience of the Master and operations manager. Factors to be considered include size of the vessel, direction of the winds and seas, orientation of departure and arrival piers to prevailing conditions, and limitations of ferries to travel at slower speeds.
- Passenger safety: Captain can maneuver the vessel to minimize wave effects. Crew duties include rough weather announcements and passenger safety management.

**High Speed Ferry Operations (over 30 Knots)**. U.S. Coast Guard Navigation and Vessel Inspection Circulars (NAVIC) 5-01 and 5-01 Change 1 provide specific guidance for high speed passenger vessels and include approved vessel operation manuals, training programs and risk assessment tools (matrix).

- Vessel equipment: operators have exceeded minimum requirements for navigation electronics including dual radar, Global Position Satellite and electronic charting with Automatic Identification System overlay.
- Manning/Training: Vessels traveling at high speed are required to have a minimum of two qualified watch-standers during normal operations. Vessel operators have developed approved training programs for high speed navigation in compliance with NAVIC 5-01 and 5-01 Change 1.

### **Ferry Traffic Routing Protocol**

The Bay Area's commute ferry companies/agencies agreed to work with the Harbor Safety Committee, Coast Guard Vessel Traffic Service (VTS), the Water Transit Authority and maritime stakeholder to develop a protocol for ferry navigation in the San Francisco and San Pablo Bays.

The Ferry Operations Work Group conducted a two-year process to develop an approach and maneuvering scheme in the vicinity of the congested San Francisco Ferry Building, as well as a routing protocol in the Central Bay to decrease the risk of collision for commute ferries. The Work Group agreed to protocols and referred them to the Harbor Safety Committee, which adopted the Work Group findings and recommendations in May 2008.

The Ferry Traffic Routing Protocol consists of planned routes and communications procedures for improving ferry navigation safety. When ferries follow routes, the Closest Point of Approach (CPAs) with other ferries is greatest at points where speeds are typically greatest. The adopted routes cross at predetermined locations at nearly right angles, enabling ferries to predict crossing situations and plan ahead.

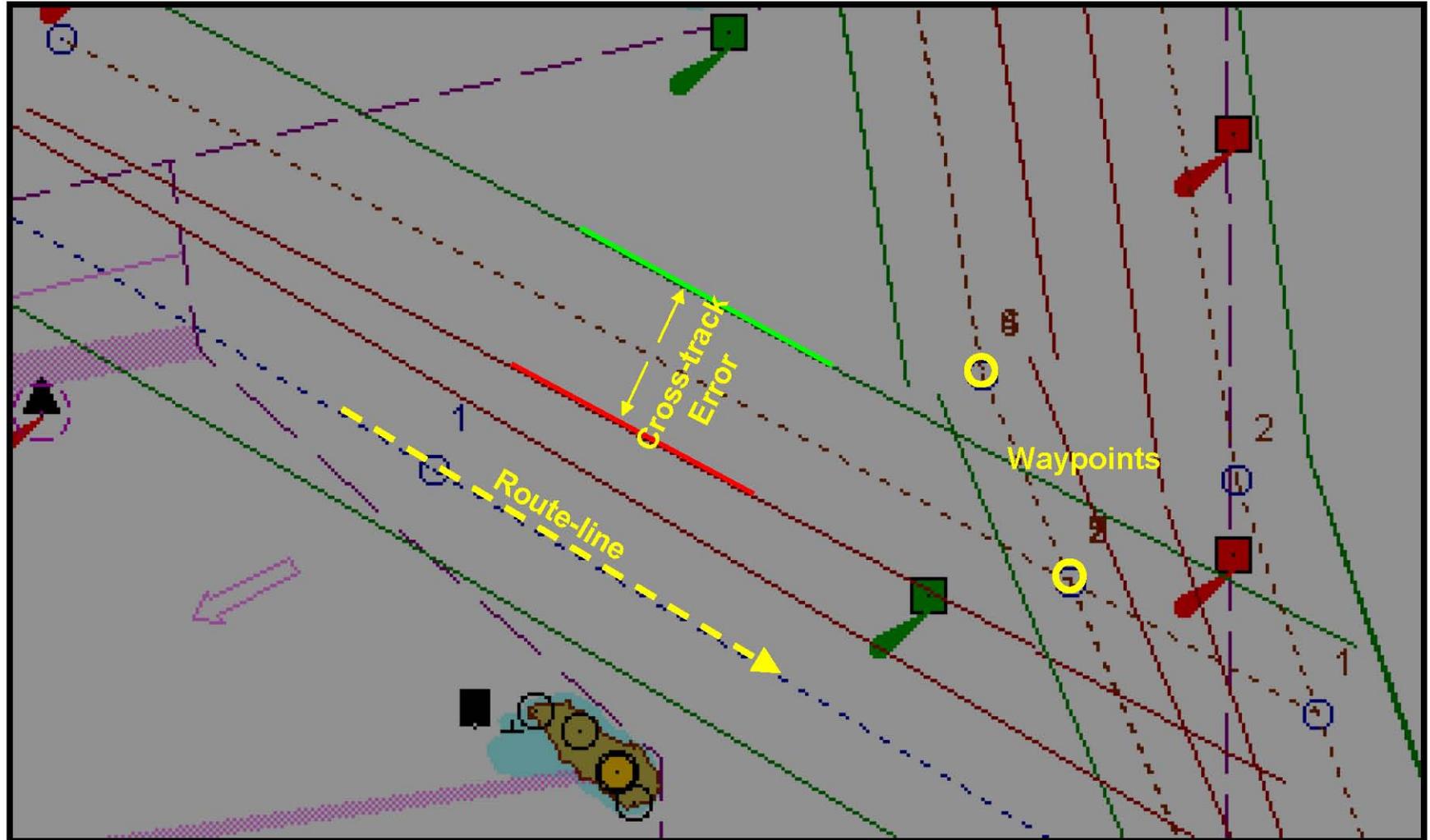
Within an approximately one-half nautical mile zone around the San Francisco Ferry Building, the protocol calls for port-to-port meeting and heightened radio communications. For inbound Ferry Building ferries, the protocol requires planning far enough in advance to avoid getting within approximately one-half nautical mile from the Ferry Building if another ferry is still at the inbounder's dock.

This reduces crowding around the Ferry Building. With ferry routes charted on nautical charts, other types of vessels can more easily predict the locations of ferries and steer clear. The Ferry Traffic Routing Protocol supports aggressive use of electronic nautical charts (ENCs) with intergraded Automatic Identification System (AIS). When all ferries consistently update their AIS data and follow routes, the protocol will ultimately lead to reduced VTS-ferry communications.

Ferry routes and the Ferry Building Approach Zone are shown in Figures 1-7, attached, and are incorporated herein. Diagrams are screen print files from vector-based electronic nautical charts (ENCs). Additional lines and labels were added to the screen print files for emphasis and clarity. For more information contact:

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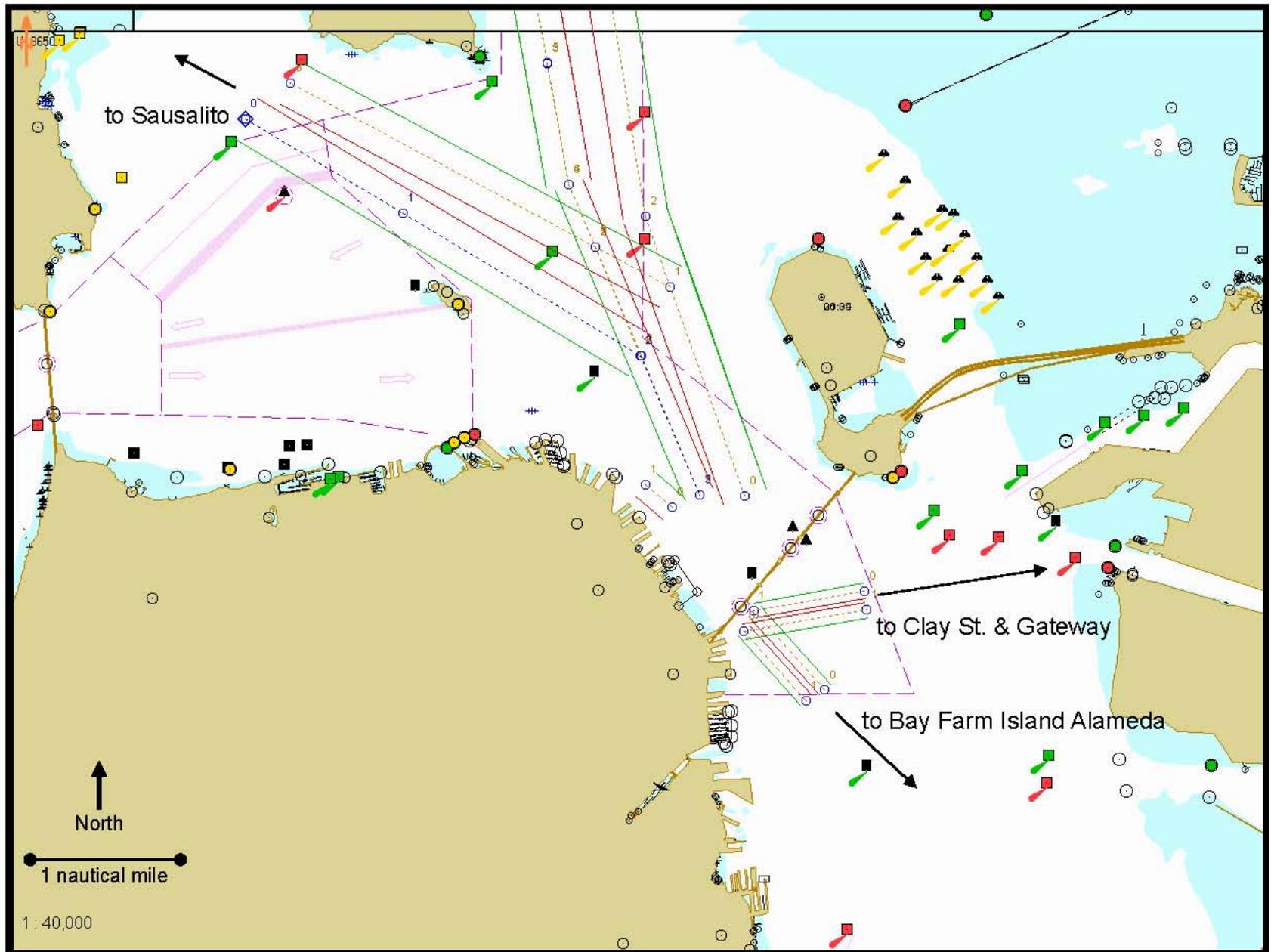
# Diagram Key



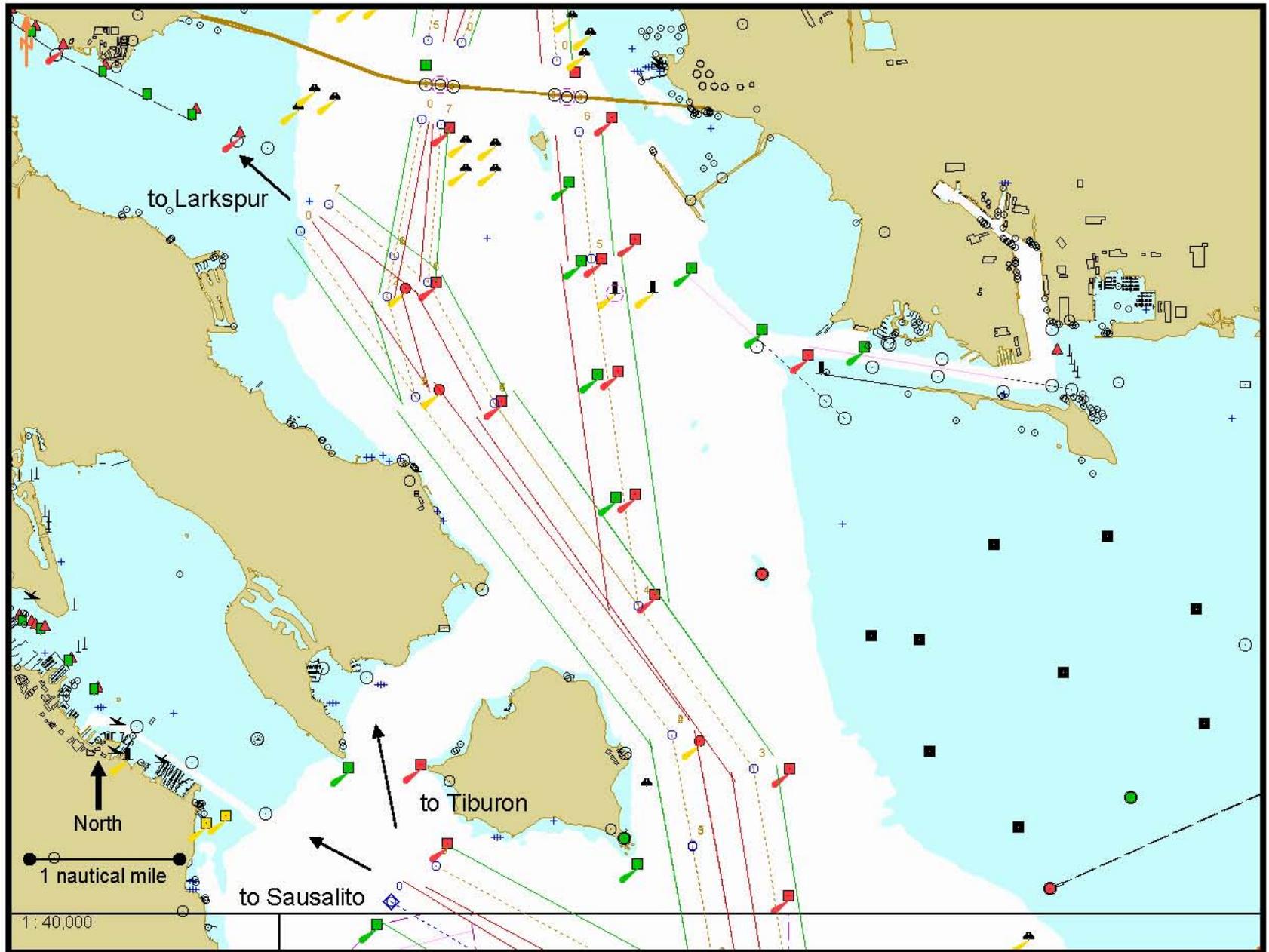
The following chart features are highlighted above.

- Route-line: Centerline of the ferry route.
- Cross-track Error: Left and right of route-line tolerance.
- Waypoints: Turns, route crossing points, and communications points.

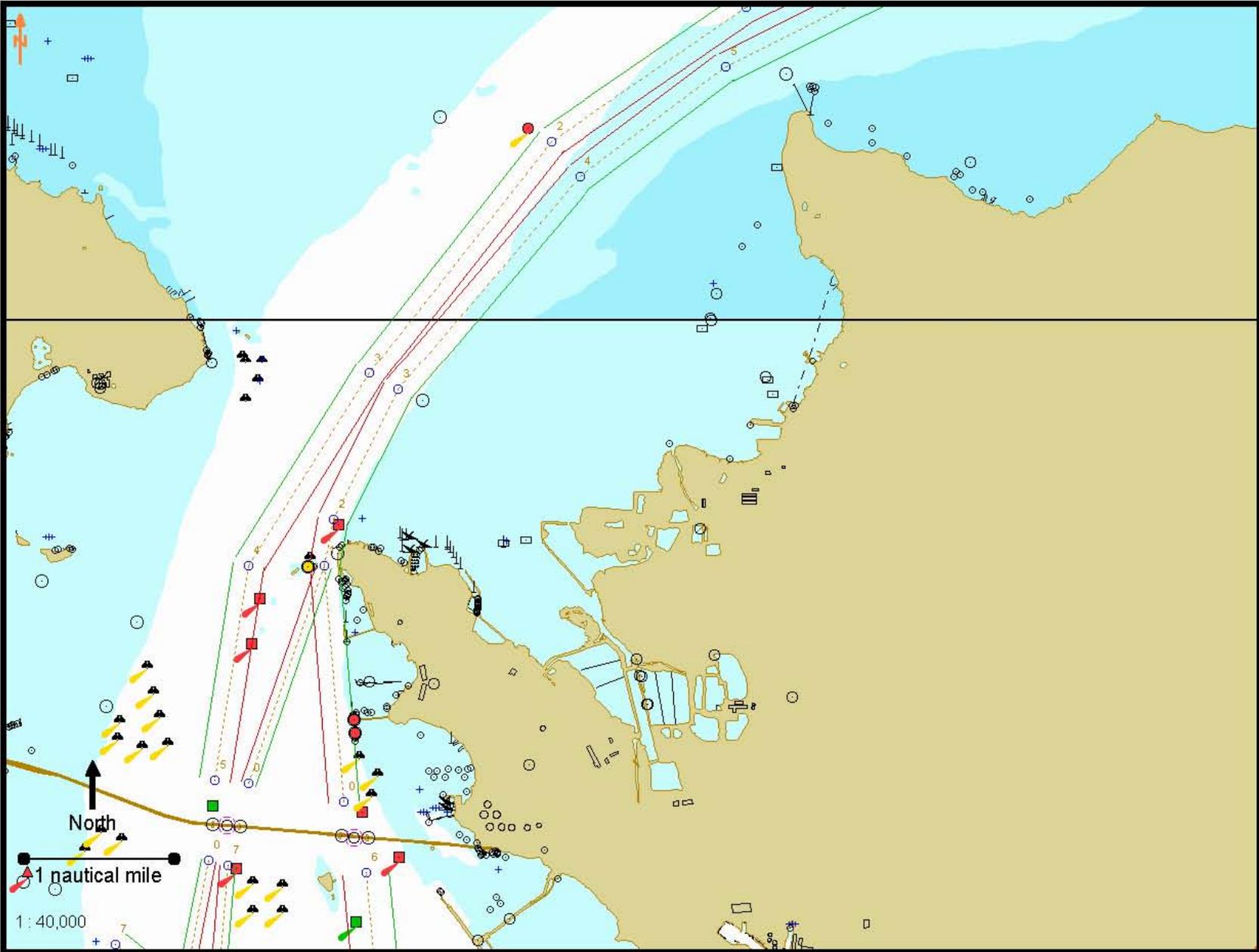
# Central Bay and South San Francisco Bay



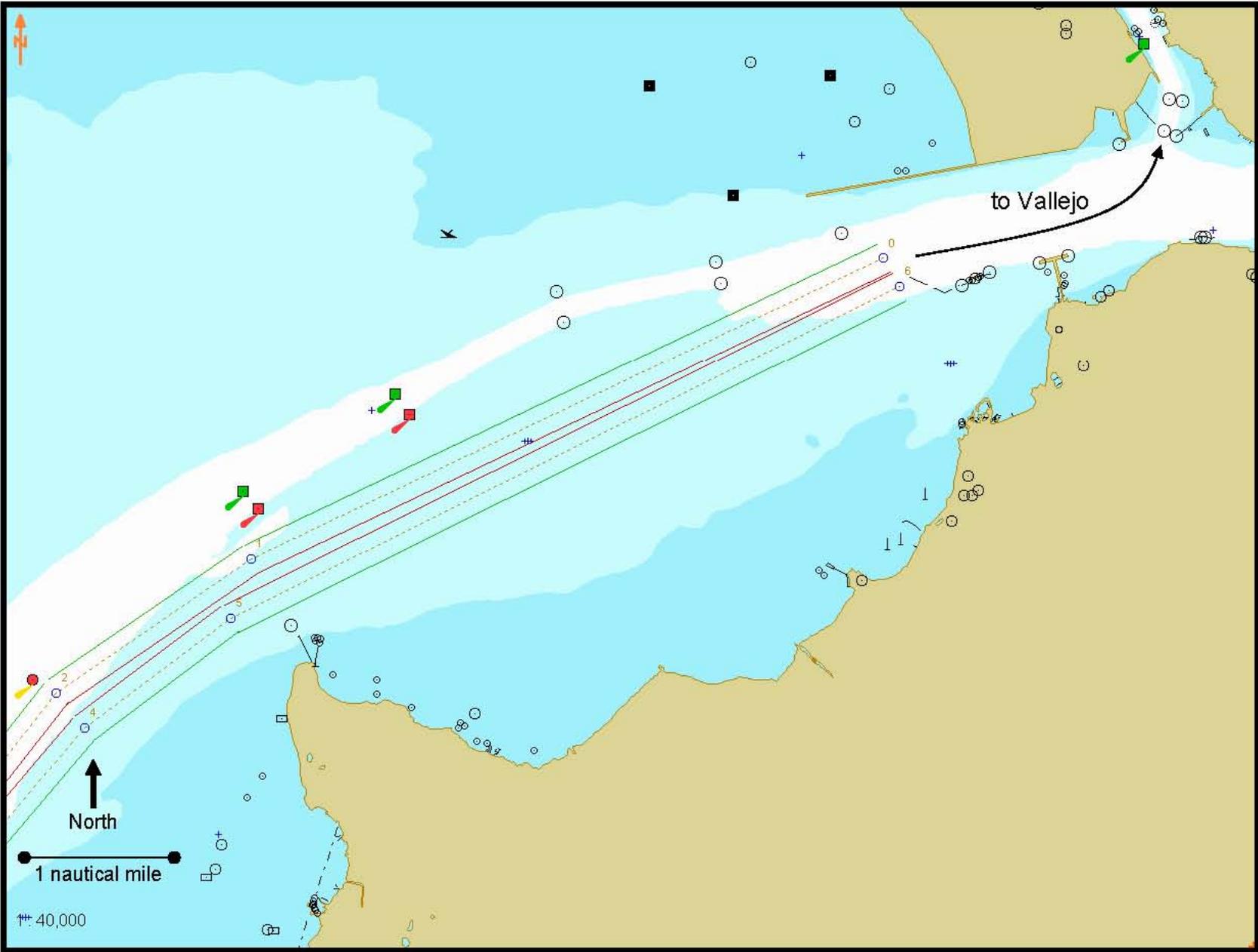
# North Channel and Southampton Shoal Channel



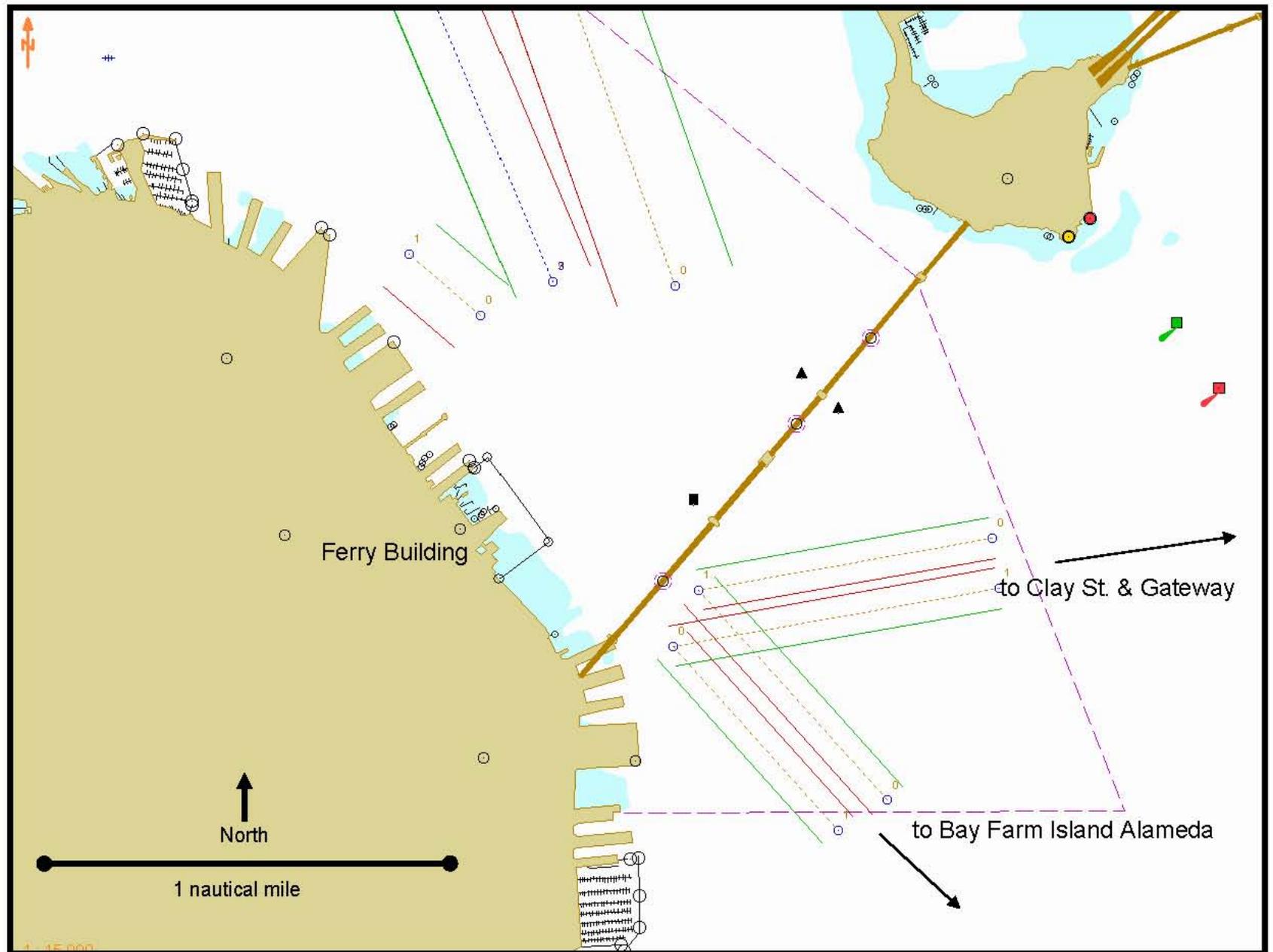
# San Pablo Strait Channel



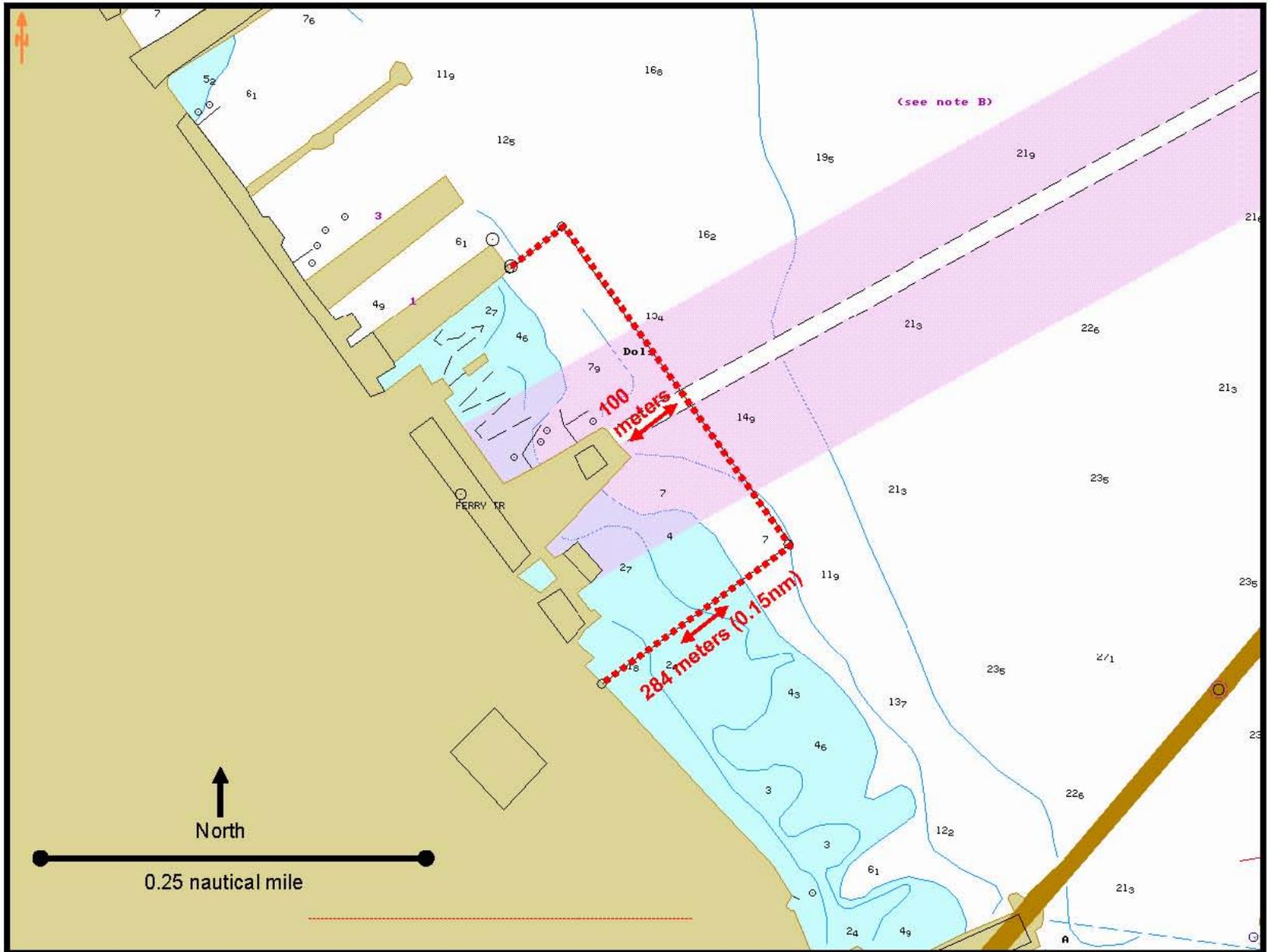
# San Pablo Bay and Mare Island Strait



# Ferry Building Approach/Departure Zone



# Ferry Building Maneuvering Area



# Source and Contact Information

Diagrams are screen print files from vector-based electronic nautical charts (ENCs).

Additional lines and labels were added to the screen print files for emphasis and clarity.

For more information contact:

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## **U.S. Coast Guard Authority to Regulate Vessel Speed**

The Federal Ports and Waterways Safety Act of 1972 (33USC1223) grants authority to the Coast Guard to further regulate vessel speed, and specifically states:

[The Coast Guard] may control vessel traffic in areas subject to the jurisdiction of the United States which the Secretary [of the Department of Homeland Security] determines to be hazardous, or under conditions of reduced visibility, adverse weather, vessel congestion, or other hazardous circumstances by a number of means, including establishing vessel traffic routing schemes and by establishing vessel size, speed, draft limitations and vessel operating conditions.

Under 33 Code of Federal Regulations (CFR) 161.11, the Coast Guard may, through the Vessel Traffic System (VTS), issue measures or directions to enhance navigation and vessel safety and to protect the marine environment, including establishing vessel traffic routing schemes.

## **International Regulations for Prevention of Collisions at Sea (COLREGS)**

Maritime practices accepted worldwide are codified under the International Regulations for Prevention of Collisions at Sea (COLREGS), which address look-outs, safe transit speed, risk of collision, and conduct of vessels in restricted visibility.

Rule 5, Look-outs, states that “Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.”

Rule 6 states, in part, that, “Every vessel shall at all times proceed at a safe speed so that the vessel can take proper and effective action to avoid collision and be stopped within distance appropriate to the prevailing circumstances and conditions.” Rule 6 continues, stating that factors to be taken into account in determining a safe speed include, but are not limited to, the state of visibility and the manageability of the vessel with special reference to stopping distance and turning ability in the prevailing conditions.

Rule 7 addresses risk of collision, and states, in part, that, “Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist.”

Rule 19, Conduct of Vessels in Restricted Visibility, states, in part, that, “Every vessel shall proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility [and] every vessel shall have due regard to the prevailing circumstances and conditions of restricted visibility when complying with the Rules....”

## **XII. Small Vessels**

### **Background**

Within the Bay, many recreational boats 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, has 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, Labor Day and Fleet Week are times of extreme congestion by small vessels. There are many occasions where six or eight races may be held in the same venue, with 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 interference with large vessels.

In addition to sailing and pleasure motor boats and personal water craft, which can attain speeds in excess of 60 mph, non-motorized vessels such as sailboards, kayaks, canoes and rowboats also frequent the Bay.

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

In addition to the Bay's commercial fishing fleet, made up of approximately 1,000 boats, party boats carrying numerous fishermen also fish the Bay and areas west of the Golden Gate Bridge. 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.** Thousands of recreational boats are concentrated near the major inbound and outbound Bay shipping lanes. While many sailboats and motor boats are on the Bay, particularly on weekends, few near-misses or accidents are reported to the Coast Guard or Vessel Traffic Service. 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 several 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 several years, none involved a collision with a vessel and no fatalities have occurred in the Bay Area.

**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.

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

	<b>Subjects</b>
U.S. Power Squadrons <a href="http://www.usps.org">www.usps.org</a>	Boating Safety Rules of the Road, Basic Rescue (A home video course is available for purchase)
U.S. Coast Guard Auxiliary <a href="http://www.cgaux.org">www.cgaux.org</a>	Boating Safety Rules of the Road, Basic Rescue
California Dept. of Boating and Waterways <a href="http://www.dbw.ca.gov/boatsafecourse.asp">www.dbw.ca.gov/boatsafecourse.asp</a>	Water Safety/Grades K–12, General

In addition, the U.S. Coast Guard operates a Boating Safety Hotline (800.368-5647) 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.

### **XIII. Vessel Traffic Service**

The U.S. Coast Guard established the Vessel Traffic Service (VTS SF or VTS) in San Francisco Bay in 1972, 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 SF. In response, the Harbor Safety Committee voted to support continued federal funding to maintain VTS SF at its current level in order to ensure navigational safety in the Bay.

The VTS for the San Francisco Bay region has six components: (1) Automatic Identification System (AIS), (2) radar and visual surveillance, (3) VHF communications network, (4) a position reporting system, (5) traffic schemes within the Bay, and (6) 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.

#### **VTS Mission**

The primary mission of VTS San Francisco is to coordinate safe, secure and efficient transit of vessels in San Francisco Bay, including its approaches and tributaries, in an effort to prevent accidents or terrorist actions, which could result in loss of life, damage to property or the environment.

VTS implements and enforces the portions of the Ports and Waterways Safety Act that enhance navigation, vessel safety and marine environmental protection and promote safe vessel movement, by reducing the potential for collisions, allisions and groundings, and the loss of lives and property associated with these incidents.

VTS provides the mariner with information related to the safe navigation of a waterway. This information enhances the safe routing of vessels through congested waterways or waterways of a particular hazard. Under certain circumstances, VTS may issue directions to control the movement of vessels in order to minimize the risk of collision between vessels, or damage to property or the environment.

The owner, operator, charterer, master or other person directing the movement of a vessel remains at all times responsible for the manner in which the vessel is operated and maneuvered and is responsible for the safe navigation of the vessel under all circumstances.

## **VTS Authority**

VTS regulatory authority comes from 33 CFR 161 Vessel Traffic Service Regulations. These regulations give VTS the authority to manage, control or direct vessel traffic within the VTS area. VTS may issue measures or directions to enhance navigation and vessel safety and to protect the marine environment, including, but not limited to:

1. Designating temporary reporting points and procedures;
2. Imposing vessel operating requirements; or
3. Establishing vessel traffic routing schemes.

The regulations can be found on the web in the Code of Federal Regulations at [www.gpoaccess.gov](http://www.gpoaccess.gov).

During conditions of vessel congestion, restricted visibility, adverse weather, or other hazardous circumstances, VTS may control, supervise, or otherwise manage traffic, by specifying times of entry, movement, or departure to, from, or within a VTS area.

Participation is required for all vessels that fall under the Bridge-to-Bridge Radio Telephone Act. Active participation (through a series of reports) is required for all vessels that fall under the Vessel Movement Reporting System (VMRS), defined as: power-driven vessels 40 meters in length or greater; tugs, 8 meters or greater while towing; and passenger vessels certificated to carry 50 or more passengers for hire.

Through the exchange of vessel transit information, VTS provides vessel operators with up-to-date information, thereby facilitating safe transits for vessels interacting on the waterways.

## **VTS Position Reporting Requirements**

Vessel position reporting requirements vary depending on a vessel's ability to transmit AIS information to VTS.

**Offshore.** Vessels are required to make radio reports on VHF Channel 12 when entering or exiting the offshore VTS reporting area, which extends approximately 30 miles west from the Golden Gate Bridge. Inbound vessels are required 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 required 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 VTS broadcasts a traffic report every 30 minutes: at minute 15 and 45 of each hour.

**Within the Bay.** Vessels report 15 minutes prior to and upon getting underway, docking, mooring, or anchoring or when departing from the VTS 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 make one report prior to departure, and do not report again unless they deviate from their schedule or route.

### **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 Benicia-Marinez 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 for inshore traffic and channel 12 for offshore traffic, and monitors channel 13 throughout the VTS area.

### **VTS Training Program Overview**

VTS Operators undergo extensive training. Before these traffic management specialists begin on-the-job training in the Operations Center, they undergo three months of intensive training at the VTS in the classroom and self-study, plus a month of offsite training. Offsite training typically includes a one-week Radar Observer Course, a one-week Automated Radar Plotting Aid (ARPA) course, a one-week Basic Shiphandling course and a one-week course in Bridge Resources Management course. All training is tailored to the individual needs of the trainee.

After this initial classroom and self-study period, new Operators/Traffic Management Specialists then undergo three to four months of closely supervised on-the-job training. This training cycle can be shortened if the person has previous VTS experience; however, the average time for a new employee to become qualified in their primary job is six to seven months. New supervisors can take an additional two to three months before qualification.

### **Outreach and Partnership**

The San Francisco Bar Pilots and the U.S. 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 team 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—comprised of VTS’ Operations Director, Operations Administrator, Training Coordinator and members of the San Francisco Bar Pilots—meets approximately every quarter to discuss how VTS and the Bar Pilots can better serve each other. Both agencies might bring in scenarios or review recordings, then discuss the interactions 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 perspective, and the pilots can then explain why a requested deviation seemed safer from the pilot’s point of view.

In addition to providing a forum for discussion, VPIC meetings have produced the automation of the transmission of ships’ arrival and departure information between VTS and the Pilots, the development of a communication protocol to resolve communication issues around marine construction projects, and the refinement of 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-VMAP is composed of member vessels, the Coast Guard and passenger vessel operators who came together to develop an emergency response plan that would ensure that 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. The San Francisco Marine Exchange is working in partnership with the Coast Guard to perform the administrative requirements of SF-VMAP.

**Benicia-Martinez Railroad Drawbridge 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. The group was formed 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 many hours with people from various segments of the San Francisco Bay maritime community to learn about mariners’ concerns and to educate mariners on how VTS can assist them. VTS personnel have been active participants on the Underwater Rocks Work Group, AIS Joint Planning Partnership, the Prevention through People Work Group, the Tug Escort Work Group, the Ferry Operations Work Group and the Navigation Work Group. Outreach efforts also have included many non-traditional stakeholders in the Bay area, such as the 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 this group, which is comprised of representatives of other Coast Guard units, local fishermen groups and state agencies.

**Marine Events.** San Francisco Bay has more permitted marine events than any other port or city in the United States. VTS has an active outreach program to the boating public, which includes meeting with various recreational boating organizations throughout the year. VTS works closely with other Coast Guard personnel and yachting organizations during the permit process to prevent recreational vessels from impeding commercial traffic. The Coast Guard hosts annual Marine Event Workshops aimed at educating event coordinators about commercial maritime traffic, Rule 9 of the Navigation Rules and VTS operations.

**VTS Shipride Program.** All VTS personnel are required to participate in approximately six ship rides and/or shore-side visits each year. This, by far, is the best method for direct, person-to-person contact with port stakeholders and the sharing of suggestions. The requirements cover almost all areas of the maritime community: piloted ships, tugs, ferryboats and shore facilities.

### **VTS Operations and Requirements**

Over the years since the inception of VTS San Francisco, the Coast Guard has periodically identified the need for upgrading VTS equipment to include state-of-the-art technology. VTS' system of tracking vessels by computer was initially installed in 1997. In 2000, the software and hardware were upgraded, and a renovation of VTS' communications system was completed. This communication system upgrade involved replacing radios at each of the VTS' high sites, converting them from an analog to a digital microwave system and installing a new radio control system. In December 2004, VTS was upgraded with Automatic Identification System antennas and software.

## **XIV. Tug Escort / Assist For Tank Vessels**

In 1990, Senate Bill 2040 (the Oil Spill Prevention and Response Act) established that tug escorting was beneficial for tanker operations and directed expeditious development of escorting regulations for 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, and 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 eight to 11 percent 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 grew into a two-year process of preparing a scientific study of how to match escort tugs to tankers, with the assistance of a consultant and by holding extensive public hearings on the results of the study. 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 specifics of tug escorting on San Francisco Bay. Additionally, the State funded a peer reviewer, Michael M. Baristas 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 (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, and 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 HSC 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 were 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 public 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 those who commented 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 OSPR Technical Advisory Committee, which is purely advisory and has no approval or disapproval authority. The issue of dual- versus single-failure standard was again debated and it was concluded to continue with the single-failure standard.

The 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 for Amended Tug Escort Regulations.) There have been no significant issues in implementing the regulations.

It should be noted that the 1997 Tug Escort regulations require that:

The OSPR 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 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....

The OSPR review to determine whether any changes should be made to the tug/tanker matching formula met the January 1, 1999 deadline; however, the regulations did not require a report and none was prepared. Rather than conduct a review every two years, the HSC, on behalf of the Administrator, reviews incidents on an ongoing basis at its monthly meetings. If further evaluation is warranted, issues are referred to the appropriate Work Group for additional analysis. Any findings and recommendations are brought before the full Committee for discussion and vote.

Subsequently, in 2001-2002, the HSC Tug Escort Work Group initiated a “sunshine” review of the entire tug escort regulations for the San Francisco Bay Region. The Work Group met for a one-and-a-half year period. The meetings were well attended by representatives of tanker operators, tug operators, the San Francisco Bar Pilots, marine terminal operators, the U.S. Coast Guard, OSPR, State Lands Commission, the San Francisco Marine Exchange and a host of other local maritime professionals.

The cornerstone of the regulatory review was a thorough examination of the tug/tanker matching matrix. The Work Group met with Dr. David Gray, Naval Architect of Glosten Associates from the Seattle-based company that developed the original tug/tanker matching matrix. Dr. Gray reviewed the assumptions upon which the matching formula was based and the present mix of tankers that call in the Bay. After much deliberation, the Work Group concluded that the tug/tanker matrix remains valid and should not be modified (determination made at the January 15, 2002 Work Group meeting and reported to the HSC at its February 14, 2002 meeting).

**Training for Tug Escort Crews.** As a result of its study of the tug/tanker matching matrix, the Work Group determined that in order for tug escorts to be effective in an emergency, training of escort tug and ship crews under pilot direction should be addressed. The Work Group concluded that training exercises could not be mandated by regulation, as the training exercises must be individual to the tugs and vessels because of the wide variety of tankers, barges and tugs and variety of conditions on the Bay. The Work Group prepared guidelines entitled “Recommendations for Conducting Escort Training on San Francisco Bay,” which outlines procedures for tug and ship crews, as well as pilots, to participate in live training exercises under agreed-upon, non-emergency conditions. A draft of the Recommendations was circulated to various tug, tanker, and barge companies and to the S.F. Bar Pilots.

The guidelines were adopted by the full Committee on May 9, 2002 (see Appendices). The HSC Secretariat, through the Marine Exchange, then sent a letter to all affected parties in the maritime community, encouraging companies to adopt the Recommendations. The Tug Escort Work Group reports that tug escort emergency maneuvers are being conducted on a voluntary basis in accordance with the HSC’s Recommended Guidelines.

In September 2008, the Tug Escort Work Group was given a presentation of a Simulator Training Program for Tugs and Pilots that is being used in Puget Sound for tug captains, Puget Sound Pilots and B.C. Pilots. Over the years it has become evident that the opportunity for on-the-water exercises involving tankers and tugs has been extremely limited at best, with few individuals trained for actual events. However, with maritime simulators becoming more sophisticated in their ability to replicate a variety of situations and with a California Maritime Academy (CMA) simulator operational within a few months, the Work Group decided to explore the opportunity for simulating local conditions on a cost-effective basis to the maritime community within the San Francisco Bay Area.

The Work Group concluded that in addition to promoting simulator training for tugs escorting tankers, simulator training is applicable to tugs assisting and docking container ships, bulk carriers and chemical ships – thus providing industry-wide benefits for safe navigation.

The Harbor Safety Committee encourages the maritime industry to provide simulator training for tug personnel with pilot participation for emergency tug operations, based on local conditions. The training will improve communication between pilots and tug masters, offer in-house training to tug industry personnel, and provide valuable “lessons learned” for emergency situations in a controlled environment.

**Escorts for Non-petroleum Tankers.** In 2003, the Harbor Safety Committee rescinded its prior recommendation 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:

- It was extremely difficult to define dangerous cargoes and quantities that could be 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.

In 2004, State legislation (SB 1480) was proposed that would allow “[t]he OSPR Administrator, in consultation with the harbor safety committees, to adopt regulations governing tugboat escorts for other vessels carrying hazardous materials that are entering, leaving, or navigating in the harbors of the state.”

The Harbor Safety Committee opposed SB 1480 and companion legislation AB 2777 because:

1. The Tug Escort Work Group carefully reviewed the nine-year record of Coast Guard Casualty reports for Chemical Tankers, the seven-year record of Coast Guard Captain of the Port (COTP) orders to require Chemical Tankers to be tug escorted, and Chemical Tanker arrivals in the Bay for the year 2003. Of 23 reported casualties, only four were for loss of steering or power; four were for the same ship, and seven were tankers carrying oil. The other casualties were minor in nature because of the broad definition of a reportable Marine Casualty.

Similarly, of the COTP orders for seven Chemical Tankers, five vessels carried oil and the other two most likely carried oil. The major increase in the number of Chemical Tankers was due to the change in definition of tankers by Lloyds of London. Also noted was the fact that most chemical tankers are double-hulled ships subject to strict standards and close vetting review.

2. The definition of “hazardous materials” is too broadly written to be meaningful in pinpointing the most dangerous chemicals and quantities hazardous to the public and the environment. As written, the legislation would affect almost every ship in the Bay, from cargo ships to tankers, and would not enhance safety.

3. The Work Group was concerned that, because the definition of hazardous materials is so broadly written, permanent broad powers would be granted to the OSPR Administrator with no criteria or analysis upon which to base his/her decision.

The Harbor Safety Committee sent its recommendation to the OSPR Administrator. The legislation was vetoed by the Governor.

## XV. Pilotage

Pilotage is of primary import 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 more than one-hundred-fifty years, the State has regulated pilotage over the Golden Gate bar through the State Board of Pilot Commissioners, which was created in 1850.

**San Francisco Bar Pilots.** This category of pilots is also referred to as Bar Pilots. A state license is required for a Bar 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 Bar Pilots for the Bays of San Francisco, San Pablo and Suisun.

**Federal Pilots.** Federal pilots are licensed by the U.S. Coast Guard to handle U.S. flag vessels under enrollment. State licenses for these pilots are not required.

**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 Board of Pilot Commissioners regulates inland pilots.

**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 issue commissions to certain 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, a grandfathering clause allows one shipping company to use its own employee(s) who are not subject to State Board of Pilot Commission regulations as pilots for docking. These employees are federally licensed.

**Vessel Movements.** The decision-making process by the Master and the Pilot to move a vessel should consider all relevant factors, including, but not limited to:

The characteristics of the vessel, such as maneuverability, size and draft;

The capabilities of the vessel's navigation equipment;

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 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.

**Harbors and Navigation Code Preventing Unlicensed Person from Performing Pilotage.** State legislation requires the use of pilots on San Francisco Bay and provides penalties to prevent unlicensed persons from performing pilotage. The penalty for acting as a pilot while not holding a pilot license was increased to a maximum of \$25,000 (Harbors and Navigation Code Section 1126).

### **Navigation Technology**

Following the Cosco Busan allision and spill in November 2007, the Governor directed OSPR to investigate the potential role of navigational technology in reducing the risk of vessel collisions in the San Francisco Bay Region. The HSC Navigation Work Group agreed to coordinate its review with the work of the Board of Pilot Commissioners, which formed a Navigation Technology Committee to develop recommendations for the enhancement of pilots' ability to safely navigate using shipboard and portable electronic navigation systems.

Over the course of several months, in investigating different types of navigation systems found on ships calling on the San Francisco Bay Area and the sufficiency of pilot training in the use of such systems, the Pilot Commission Technology Committee considered presentations by experts in navigation technology and in the education of mariners in the use of the technology. The committee also evaluated portable electronic navigation chart systems that can be brought aboard by pilots, various comprehensive reports on their use, liability issues and interface with shipboard equipment and how portable pilot units are regulated in other jurisdictions.

The HSC Navigation Work Group reviewed the recommendations adopted by the Pilot Commission and developed recommendations to the Harbor Safety Committee. The Work Group noted that prudent mariners rely on an array of informational sources when navigating, including paper charts, electronic charts, Army Corps of Engineers charts, USCG Notices to Mariners, etc.

Portable electronic navigation chart systems that can be brought aboard by pilots, or Portable Pilot Units ("PPUs"), are an additional navigational tool proposed to be carried by Pilot Commission-licensed pilots in San Francisco Bay. These units cannot supplant onboard systems; however, their use is appropriate in the Bay due to its variety of microclimates and periods of dense fog.

To further navigational safety, the Work Group agreed to support international efforts to standardize symbols used on onboard charts. Confusion can result when piloting the more than 900 different ships that transit the Bay, many of which carry different charting systems featuring proprietary symbology. Future training of Pilot Commission-licensed pilots in advanced electronic navigation systems will include symbology used on different charts.

In July 2008, the HSC adopted the following specific recommendations:

1. Urge the Board of Pilot Commissioners, as a near-term priority, to work with the San Francisco Bar Pilots to incorporate in the Pilot training program enhanced training in advanced electronic navigation systems, providing exposure to a greater number of systems and variety of presentations.

2. Support adoption by the Board of Pilot Commissioners of a regulation to require that pilots licensed by the Pilot Commission be equipped with, and trained in the use of, portable electronic navigation equipment, commonly known as Portable Pilot Units ("PPUs"). The regulation should require that pilots be equipped with PPUs at all times while piloting except when the pilot deems that embarking on or disembarking from a vessel while carrying a PPU may present an unacceptable safety hazard to the pilot or when circumstances would prevent its use.

Such PPUs shall, at a minimum, have the following capabilities:

- (a) Displaying approved electronic navigation charts (ENCs) issued by the cognizant U.S. government authority;
- (b) Displaying the vessel's position and heading on such ENCs to the accuracy required by the International Maritime Organization (IMO) for Automatic Identification Systems (AIS); and
- (c) Displaying other navigational information as provided through the vessel's AIS pilot plug.

## **XVI. 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 Chapter V, Surveys, Charts and Dredging. Accurate tidal information is essential in order to calculate required underkeel clearances for vessel transit. This is particularly critical in the Bay region where minimal clearances may occur in certain channels. The committee reiterates its support for “real time” accurate measurement of tides, such as the P.O.R.T.S. system recommended in Chapter II, General Weather, Tides and Currents.

Underkeel clearance is the distance between the deepest point on the vessel and the bottom of the channel in still water conditions. Tank vessels carrying oil or petroleum products as cargo should maintain minimum underkeel clearances as listed below. The underkeel clearances are minimum standards during normal, calm conditions. Masters and pilots should use prudent seamanship and should evaluate the need for additional clearance to accommodate squat rolling, listing, sink and pitch.

The following are guidelines for underkeel clearance of tank vessels:

- a. Tank vessels west of the Golden Gate Bridge: Ten percent (10%) of the vessel’s draft.
- b. Tank vessels under way east of the Golden Gate Bridge: Two feet (2).
- c. Tank vessels at final approach to berth and at berth: Always afloat.

Regarding single hull tankers, on July 30, 1996, the Coast Guard published the Final Rule (33 CFR 157.455, effective November 27, 1996) on Operational Measures to Reduce Oil Spills for Existing Tank Vessels of 5,000 gross tons or more without double hulls. In part, the regulations require 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 are to discuss the tanker’s planned transit. The regulations can be found on the web in the Code of Federal Regulations at [www.gpoaccess.gov](http://www.gpoaccess.gov).

A Working Group was formed with representatives from the San Francisco Bar Pilots, Coast Guard, Port authorities and the maritime industry to evaluate the process of calculating, in a dynamic condition, underkeel clearances. The above guidelines on minimum clearances for the San Francisco Bay Area were established Captain of the Port.

## **XVII. 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 that 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 (CoE) and NOAA.

A new, two way traffic separation scheme north of Alcatraz was proposed that would require lowering areas such as Arch Rock, Harding Rock, and Shag Rocks to a minimum of -55' MLLW, and would cost between \$25 to \$43 million in federal and state (local) funds. The *San Francisco Bay Rock Removal Feasibility Study* was initiated in April 2000. The CoE, working with the Harbor Safety Committee's Underwater Rocks Work Group and the California State Lands Commission, investigated the economic and environmental feasibility of lowering the rock mounds to depths required for safe navigation. The CoE determined that there was not a federal interest in pursuing a structural alternative (physically lowering some or all of the rocks) as a result of the Feasibility Study. The San Francisco Central Bay Rock Removal Project was officially discontinued.

**Bridge Management.** The cost of 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.

**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 CoE, 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.** Seven ports are within the geographic boundaries of the Harbor Safety Plan: San Francisco, Oakland, Richmond, Redwood City, Benicia, Sacramento and Stockton. Nothing in this plan would create an advantage for any one of these ports as compared to any other port within the plan area.

### **Environmental Impacts**

San Francisco Bay is a unique geographical area. It is the largest estuary on the Pacific Coast between Alaska and the tip of South America, with a shoreline, including sloughs, certain waterways and islands, of approximately 1,000 miles. Sixty-five percent of the rain and snowfall in California drains into rivers and creeks that feed the Bay.

Because of its size, depth and shelter from the open ocean, San Francisco Bay is a major harbor. Reflecting the trend in total U.S. commodities, a large percentage of the material shipped through the harbor is petroleum. The Bay presents 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, including the Ports of Sacramento and Stockton.

A major oil spill in the Bay would cause millions of dollars in damage to the marine environment, adversely affecting a variety of natural 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 wetlands, tidal flats, and open water of the San Francisco Bay Estuary provide essential habitat—food, water, shelter and other benefits—for over 500 species of fish, amphibians, reptiles, birds and mammals. A number of these species are threatened or endangered. 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 protect 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 U.S. Coast Guard, the Office of Spill Prevention and Response, the petroleum and shipping industries, recreational boaters, the CoE and others with expertise in shipping and navigation, regularly meet to develop additional strategies to further safe navigation and oil spill prevention and to 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.

## **XVIII. Plan Enforcement**

The Oil Spill Prevention and Response Act (Act) provides for the Harbor Safety Committee to suggest mechanisms to ensure that the provisions of the Harbor Safety Plan be fully, uniformly and regularly enforced. Traditionally, the U.S. 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. The USCG also has been the mainstay of enforcement within the plan boundaries, and it is expected that it will continue in this role.

Under the Act, the State Lands Commission and the California Department of Fish and Game are granted dramatically increased roles and enforcement responsibilities. The State Lands Commission inspects facilities and vessels that are moored alongside the above-mentioned privately operated terminals, and monitors the cargo transfer operations. In the event of a violation, the appropriate state or federal agency is notified. The Department of Fish and Game enforces state regulations under the Act and monitors vessel bunkering operations along with the Coast Guard, and has the power to impose criminal and civil penalties for violations.

Tug Escorts are monitored by the Clearing House (CH), which was established to monitor the tug escort program for the Department of Fish and Game. The Marine Exchange of the San Francisco Bay Region administers the CH. The CH 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 CH contacts the pilot, the master of the vessel, and the shipping company and/or agent and advises them accordingly. The vessel may not proceed until the escort tug is on station. The CH notifies the Department of Fish and Game of suspected violations. 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 to dock or to proceed.

Review and update of the Harbor Safety Plan is mandated to take place annually on or before June 30th. At that time, all aspects of the Harbor Safety Plan are assessed and the findings and recommendations for improvements are sent to the Administrator.

### **2004 Tug Escort Violations**

After a four-year lull, 2004 saw a marked increase in violations of tug escort regulations within San Francisco Bay, San Pablo Bay and Suisun Bay. In 2004, the CH contacted the Office of Spill Prevention and Response (OSPR) 23 times in regard to possible violations. Of these, three notifications involved confusion over the alternate compliance status of one tanker operator and were ruled invalid by OSPR. The 20 remaining incidents were determined by OSPR to be infractions.

The majority of the infractions (13) involved tank barge movements in which the line-haul tug failed to notify the CH of the impending movement. Less frequent violations include failure of the escort tug to be certified for escort duties, failure of the escort tug to notify the CH, expired bollard-pull certificates and failure of the tanker pilot to notify the CH. Of the 20 infractions, the number of violations per company ranged from three companies with only one violation each to one company with seven violations.

### **OSPR Enforcement Process**

Due to the increase in violations that occurred in 2004, the Committee raised concerns with OSPR's enforcement procedures and requested that OSPR shorten the amount of time between reported violations and their resolution. In response, OSPR has streamlined its procedures as follows: First, the CH will now report violations directly to the OSPR Legal Branch. Second, the OSPR Legal Branch will immediately notify the company of the reported violation. Depending on the severity of the violation and the history of the violator, either a notice of violation (informal) or an administrative civil penalty complaint (formal) will be sent to the owner and/or operator outlining the specifics of the violation, civil penalty assessed and OSPR's costs for investigation.

OSPR will continue to make periodic reports to the Committee on the status of current violations.

### **Coordination of Enforcement Responsibilities**

The Coast Guard and the Department of Fish and Game 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 minimizes enforcement efforts required for 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 Department of Fish and Game is the primary enforcement agency for state regulations.

## **XIX. Substandard Vessel Inspection**

### **Substandard Vessel Examination Program**

Beginning May 1, 1994, the U.S. 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 adopted an amendment to the 'International Convention for the Safety of Life at Sea (SOLAS), 1974' 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 USCG Port State Control Branch continues its mission in identifying and eliminating substandard foreign commercial vessels from U.S. waters by use of the USCG's risk-based boarding priority matrix system.

At the HSC monthly meetings, the Sector reports on steering and propulsion casualties and other incidents impacting maritime safety.

## **XX. Recommendations Implemented Or Addressed**

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. The respective chapter of the Harbor Safety Plan includes background discussion of the issues addressed by each recommendation. The following recommendations have been implemented by the responsible agency.

### **I. Geographical Boundaries**

No recommendations.

### **II. General Weather, Tides and Currents**

No recommendations.

### **III. Aids to Navigation**

No recommendations.

### **IV. Anchorages**

It was recommended that the USCG adopt pre-designated anchorage areas within the existing general anchorages throughout the VTS SF area, and in particular within General Anchorage 9, so that safer and more disciplined anchoring practices may be managed by VTS SF. The final resolution was to divide the anchorage into two areas: the western side has been designated for deep-draft vessels and the eastern side for lighter-draft vessels. In addition, VTS requires that vessels not anchor closer than 750 yards from one another.

### **V. Harbor Depths, Charts and Dredging**

1.a. The recommendation to “establish a new two-way Traffic Separation Scheme north of Alcatraz to allow safer navigation of deeply laden tankers” has been implemented, and is now referred to as the “Deep Water Traffic Lane.” (Date established: 1992)

1.b. The recommendation requesting the Corps of Engineers to further evaluate the lowering of Harding, Arch, Shag and Blossom Rocks has been implemented. The COE determined that there was not a Federal interest in pursuing a structural alternative (physically lowering some or all of the rocks) as a result of the Feasibility Study for the proposed project. No further action. (See Ch. V, section on Navigational Issues Associated with Channel Design and Dredging.)

2. The recommendation to eliminate the dogleg at buoy “C” of the San Rafael main ship channel to maintain proper two-way traffic separation” has been addressed. This action was evaluated and found cost prohibitive. (Date addressed: 1993)

## **VI. Contingency Routing**

No recommendations.

## **VII. Vessel Speed and Traffic Patterns**

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.

## **VIII. Accidents and Near-Accidents**

The HSC adopted a definition of a reportable ‘Near Miss’ situation to standardize reporting along the California Coast. However, after consulting with the other California Harbor Safety Committees, the idea to establish a systematic reporting of a ‘near miss’ was abandoned because of the issue of potential liability by the reporting party. The USCG considered a program to address non-reportable near casualties on a national and international level, but put the program on hold in November 2002 because of lack of funding. (Date addressed: 2002)

## **IX. Communication**

1. The recommendation to alleviate congestion on Channel 13 was implemented when the USCG shifted the primary VTS channel to Channel 14. The Harbor Safety Committee endorsed the Coast Guard’s efforts to improve the existing system. (Date addressed: 1994)
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.

**X. Bridges**

1. 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.)
2. 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.)
3. 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.)
4. 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.)
5. Request Caltrans and the Golden Gate Bridge District to shield bridge floodlights to reduce the glare for ships. (Note: Completed)

**XI. Small Passenger Vessels – Ferries**

1. The Ferry Operations Work Group recommends that the ferry routes developed by the Work Group working with ferry operators, captains and the VTS, be adopted by the Harbor Safety Committee and incorporated into the Harbor Safety Plan.
2. The Work Group further recommends the HSC work with NOAA to include the routes and accompanying notes on area nautical charts. (Date established: May 2008)

**XII. 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 (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 efforts.

### **XIII. 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.

### **XIV. 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.

### **XV. Pilotage**

1. The recommendation that the California Harbor and Navigation Code be amended to add requirements for shipping company employees eligible to pilot vessels in the Bay Area has been addressed by State and Federal regulation. (Date addressed: 1996)
2. The recommendation that Coast Guard regulations be amended for pilotage has been deleted as not under the purview of the Harbor Safety Committee.

### **XVI. Underkeel Clearance**

1. The recommendation that “guidelines for underkeel clearances of tank vessels carrying oil or petroleum products as cargo” be established has been implemented by establishing the following minimum clearances:
  - Tank vessels west of the Golden Gate Bridge: Ten percent (10%) of the vessel’s draft.
  - Tank vessels under way east of the Golden Gate Bridge: Two feet (2).
  - Tank vessels at final approach to berth and at berth: Always afloat.
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.

**XVII. Economic and Environmental Impacts**

No recommendations.

**XVIII. 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.

**XIX. Substandard Vessel Inspection Program**

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

## **XXI: Harbor Safety Committee Educational Materials**

The Harbor Safety Committee has produced a number of educational materials in an effort to increase safe use of the Bay. Copies of the following are available by contacting the San Francisco Marine Exchange at 415.441-6600.

*Your Guide to Recreational Marine Radio Communications for San Francisco Bay.* Brochure. July 2001.

*Where The Heck Is Collinsville?* Brochure. February 2002. Revised February 2008.

*Mariners, Do You Speak Channel 14?* Brochure. April 2003.

*Sharing the Bay.* Video, also available in CD and DVD format. Early 2004.

*Rules 9 & 5...Laws To Live By.* Brochure. May 2004.

*P.O.R.T.S. (Physical Oceanographic Real-Time System)* Brochure. December 2004.

*Kayakers, Be Alert!* Safety Sticker. April 2006.

*Knowledge for Novice Boaters.* Laminated safety placard. January 2007

*Stop Mayday Hoax Calls.* Laminated poster for USCG. January 2009.

**Best Maritime Practices**

**Background.** The container ship Cosco Busan allided with the Oakland Bay Bridge November 7, 2007, releasing approximately 53,000 gallons of fuel oil. Shortly afterward Governor Schwarzenegger issued a directive to investigate and make recommendations on the navigational and operational aspects of the Cosco Busan allision. The HSC was assigned this task by OSPR. HSC Work Groups discussed the issues at length, and based on facts known of the incident at the time, developed recommendations to improve vessel transit in the Bay. The findings and recommendations developed by the Harbor Safety Committee in light of the allision covered a number of topics, some of which are now included in the Harbor Safety Plan.

Additionally, prior to the Cosco Busan incident, OSPR directed the five Harbor Safety Committees in California to adopt Best Maritime Practices for each harbor to ensure that vessels in transit will be aware of the guidelines of operation in California harbors, to be incorporated into each Harbor Safety Plan. During 2008 and early 2009, the S.F. Harbor Safety Committee developed a number of Best Maritime Practices (“BMPs”) for safe navigation in the San Francisco Bay Region. These guidelines, summarized below, provide important information necessary for safe, reliable and environmentally sound vessel movements in and around San Francisco Bay. The BMPs also are available on the Marine Exchange website: [www.sfmex.org/support/hsc/introhscbestpractices.htm](http://www.sfmex.org/support/hsc/introhscbestpractices.htm).

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**Large Vessels and Tugs with Tows  $\geq$  1600 GT: Speed Restrictions on San Francisco Bay**

**Large Vessels** are power driven vessels of 1600 gross tons or more, and tugs with tows of 1600 gross tons or more. Specific areas where a **15 knot speed limit** applies within the San Francisco Bay region are prescribed in 33 CFR 165.1181:

- Golden Gate Traffic Lanes, which include the westbound and eastbound lanes west of the Golden Gate Precautionary Area
- Golden Gate Precautionary Area
- Central Bay Traffic Lanes, which include the Deep Water Traffic Lane, the eastbound lane (south of Alcatraz Island) and the westbound lane (south of Harding Rock)
- Central Bay Precautionary Area
- North Ship Channel between North Channel Lighted Buoy “A” and the Richmond-San Rafael Bridge
- Southampton Shoal Channel including the Richmond Long Wharf maneuvering area
- Richmond Harbor Entrance Channel
- Oakland Harbor Bar Channel including the Outer and Inner Harbors Entrance Channels
- San Pablo Strait Channel
- Pinole Shoal Channel
- Benicia-Martinez Railroad Drawbridge

Additionally, power driven vessels of 1,600 or more gross tons shall 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.

**Note:** In instances where a slower speed than the 15 knot RNA limit is required for safe navigation, the COLREGS will prevail.

See Harbor Safety Plan Chapter VII: Vessel Speed and Traffic Patterns for discussion.

**Large Vessels and Tugs with Tows  $\geq$  1600 GT: Guidelines for Navigating in Reduced Visibility**

**Large Vessels** are power driven vessels of 1600 gross tons or more, and tugs with tows of 1600 gross tons or more. Mariners are at all times to comply with the requirements of the COLREGS.

**Critical Maneuvering Areas (CMAs):** There are areas within the Bay where additional standards of care are required due to the restrictive nature of the channel, proximity of hazards, or the prevalence of adverse currents. Large vessels should not transit through CMAs when visibility is less than 0.5 nautical miles. Locations within the Bay identified as Critical Maneuvering Areas:

- Redwood Creek
- San Mateo-Hayward Bridge
- Oakland Bar Channel\*
- Islais Creek Channel
- Richmond Inner Harbor
- Richmond-San Rafael Bridge, East Span
- Union Pacific Bridge
- New York Slough, up-bound
- Rio Vista Lift Bridge

\*The Oakland Bar Channel is identified due to cross currents and its proximity to the Bay Bridge and Yerba Buena Island.

**Vessels docked:** Large vessels at a dock within the Bay should not commence a movement if visibility is less than 0.5 nautical miles at the dock.

**Vessels proceeding to dock:** Large vessels proceeding to a dock should anchor if visibility at the dock is known to be less than 0.5 nautical miles, unless, under all circumstances, proceeding to the dock is the safest option.

**Note:** Vessel pilots or operators should notify VTS upon determination that a scheduled movement will be delayed or cancelled. If underway, they shall make a sailing plan deviation report per VTS regulations.

Adopted March 2008. See Harbor Safety Plan Chapter II: General Weather, Currents and Tides for discussion.

**Large Vessels and Tugs with Tows  $\geq$  1600 gross tons: Guidelines for Navigating in Severe Weather**

A number of factors must be considered when limiting transits in the Bay or closing the Bar due to severe weather, including sea state, tidal influences, visibility, traffic density, and wind advisories issued by NOAA. The size, class and condition of the vessels being addressed must also be considered. The HSC recommends a tiered approach, applying greater caution as conditions worsen.

***Sustained winds exceeding 25 knots in the Bay***

- Vessels should closely evaluate whether it is safe to transit in the Bay. Size, class and sail area of the vessel, tidal influences, visibility, and traffic density should all be considered.
- VTS San Francisco will establish regular communications with bridge watches of VTS users in Bay Area anchorages, and more closely monitor swing circles to ensure vessels are not dragging.

***Sustained winds exceeding 40 knots in the Bay***

- Transits to and from berths are not recommended.

***Sustained winds exceeding 40 knots and/or seas exceed 12 ft at the Sea Buoy***

- Bar traffic restrictions and closure should be considered. Size and class of the vessel, draft, swell period, tidal influences, visibility, and traffic density should all be considered. Strong ebb tides should be avoided, and a minimum of 10 feet under-keel clearance is recommended.

**Procedures for Closing the Bar or Restricting Bar Traffic**

- Bar closures are exercised on a situational basis without specifically defined weather or security conditions.
- The most recent San Francisco Bar Pilot over the Bar, inbound or outbound, shall make the recommendation to the dispatcher that the Bar should be considered for closure, or traffic limited to one-way traffic.
- In the event that the station boat is “boarded off”, then the station boat captain will make the recommendation to the dispatcher.
- The dispatcher will then notify the Operations Pilot, who will notify the Port Agent.
- The Operations Pilot or Port Agent will then notify the U.S. Coast Guard VTS and Command Duty Officer at the Sector San Francisco Command Center.

## Appendix A

- The Captain of the Port will consult with the Operations Pilot or Port Agent prior to closing the bar under Captain of the Port authority. The Coast Guard will then issue a Marine Safety Broadcast communicating the closure or traffic restriction.
- The procedure for lifting traffic restrictions or re-opening the Bar will be the same as that for restricting traffic or closing the Bar.
- Vessels under Federal Pilotage or Public Vessel may petition the Captain of the Port to transit the San Francisco Bar.

Adopted January 2009. See Harbor Safety Plan Chapter II: General Weather, Currents and Tides for discussion.

### **Tugs with Tows <1600 Gross Tons: Guidelines for Navigating in Reduced Visibility**

**Critical Maneuvering Areas (CMAs):** There are areas within the Bay where additional standards of care are required due to the restrictive nature of the channel, proximity of hazards, or the prevalence of adverse currents. Tugs with tows should not transit through CMAs when visibility is less than 0.25 nautical miles. Tugs with tows in petroleum service should not transit through CMAs when visibility is less than 0.5 nautical miles.

Locations within the Bay identified as Critical Maneuvering Areas:

- Redwood Creek
- San Mateo-Hayward Bridge
- Oakland Bar Channel\*
- Islais Creek Channel
- Richmond Inner Harbor
- Richmond-San Rafael Bridge, East Span
- Union Pacific Bridge
- New York Slough, up-bound
- Rio Vista Lift Bridge

\*Note: the Oakland Bar Channel is identified due to cross currents and its proximity to the Bay Bridge and Yerba Buena Island.

**Vessels docked:** Tugs with tows at a dock within the Bay should not commence a movement if visibility is less than 0.25 nautical miles at the dock. Tugs with tows in petroleum service at a dock within the Bay should not commence a movement if visibility is less than 0.5 nautical miles at the dock.

## Appendix A

**Vessels proceeding to dock:** Tugs with tows proceeding to a dock should anchor if visibility at the dock is known to be less than 0.25 nautical miles, unless, under all circumstances, proceeding to the dock is the safest option. Tugs with tows in petroleum service proceeding to a dock should anchor if visibility at the dock is known to be less than 0.5 nautical miles, unless, under all circumstances, proceeding to the dock is the safest option.

Note: Vessel captains or operators should notify VTS upon determination that a scheduled movement will be delayed or canceled. If underway, they shall make a sailing plan deviation report per VTS regulations.

Adopted February 2009. See Harbor Safety Plan Chapter II: General Weather, Currents and Tides for discussion.

### **Tugs with Tows <1600 Gross Tons: Guidelines for Navigating in Severe Weather**

A number of factors must be considered when limiting transits in the Bay or closing the Bar due to severe weather, including sea state, tidal influences, visibility, traffic density, and wind advisories issued by NOAA. The size and condition of the vessels being addressed must also be considered. The Tug Escort Work Group recommends a tiered approach, applying greater caution as conditions worsen.

#### ***Sustained winds exceeding 25 knots in the Bay***

- Tugs with tows should closely evaluate whether it is safe to transit in the Bay. Size and sail area of the vessel, tidal influences, visibility, operator skill and traffic density should all be considered.
- VTS San Francisco will establish regular communications with bridge watches of VTS users in Bay Area anchorages, and more closely monitor swing circles to ensure vessels are not dragging.

#### ***Sustained winds exceeding 40 knots in the Bay***

- Transits to and from berths are not recommended, but may be performed following a careful risk management evaluation by the vessel operator and vessel management.

## Appendix A

### *Sustained winds exceeding 40 knots and/or seas exceed 12 ft at the Sea Buoy*

- Bar traffic restrictions and closure should be considered for tugs with tows. Size of the vessel, draft, swell period, tidal influences, visibility, and traffic density should all be considered. Strong ebb tides should be avoided, and a minimum of 10 feet under-keel clearance is recommended.

Adopted February 2009. See Harbor Safety Plan Chapter II: General Weather, Currents and Tides for discussion.

### **Emergency Training for Tug Escorting**

A set of recommendations for conducting Escort Training on San Francisco Bay is included in the Harbor Safety Plan (Appendix J). The guidelines anticipated live escort training exercises; however, few opportunities arise for on-water exercises involving tankers and tugs, with few individuals trained for emergency events. With maritime simulators becoming more sophisticated in their ability to replicate a variety of situations and with a California Maritime Academy simulator soon operational, the HSC found simulating local conditions to be a cost-effective alternative to on-water exercises.

The Work Group concluded that in addition to promoting simulator training for tugs escorting tankers, simulator training is applicable to tugs assisting and docking container ships, bulk carriers and chemical ships – thus providing industry-wide benefits for safe navigation.

The HSC recommends the use of simulators to improve communication between pilots and tug masters, offer in-house training to tug industry personnel, and provide valuable “lessons learned” for emergency situations in a controlled environment.

Adopted November 2008. See Harbor Safety Plan Chapter XIV: Tug Escort/Assist for Tank Vessels for discussion.

### **S.F. Bar Pilots: Use of Portable Navigation Units**

The SF HSC recommends that San Francisco Bar Pilots be trained in the use of and equipped with Portable Pilot Units (PPUs) at all times while piloting, except when the pilot deems that embarking on or disembarking from a vessel while carrying a PPU may present an unacceptable safety hazard to the pilot or when circumstances would prevent its use.

Such PPU shall, at a minimum, have the following capabilities:

- (a) Displaying approved electronic navigation charts (ENCs) issued by the cognizant U.S. government authority;

## Appendix A

- (b) Displaying the vessel's position and heading on such ENCs to the accuracy required by the International Maritime Organization (IMO) for Automatic Identification Systems (AIS); and
- (c) Displaying other navigational information as provided through the vessel's AIS pilot plug.

Adopted July 2008. See Harbor Safety Plan Chapter XV: Pilotage for discussion.

### **Small Passenger Vessels - Ferries: Recommended Guidelines for Navigating in Reduced Visibility and Severe Weather**

#### **Safety Practices**

The Master of a ferry is the person in charge of the vessel, responsible for the safety of the passengers and crew at all times, and has the authority to decide if it is safe to get underway or to proceed.

In reduced visibility and inclement weather conditions, the following practices are followed:

- A go or no-go decision to get underway is made by the vessel Master or the company Operation Manager, based on conditions along the entire route, using all available information including the experience of the master and operations manager.
- Look-outs: the vessel Master assigns crewmembers for look-out duty based on the existing or anticipated conditions; the applicable regulations are found in the Navigation Rules and Regulations, Rule 5 Look-out (text attached).
- Safe speed: the vessel is required to proceed at a speed appropriate to the prevailing circumstances and conditions, which include state of visibility and the manageability of the vessel with special reference to stopping distance and turning ability. Other factors include participation in fixed ferry routes, wind advisories issued by NOAA, sea state, traffic density, and applicable Navigation Rules and Regulations (see attached verbiage from Rule 6 Safe Speed).
- Equipment: each Ferry is required to have at minimum one radar; commuter ferry vessels generally have two operational radars onboard; the vessel Master is required to have a radar observer license endorsement. Global Positioning Satellite, Automatic Identification System and Electronic Charting navigation systems are also installed and used to assist navigation.

## Appendix A

### In conditions of high wind and waves:

- Go/no-go decision is made by the vessel Master or the company Operation Manager, based on conditions along the entire route, using all available information including the experience of the master and operations manager. Factors to be considered include size of the vessel, direction of the winds and seas, orientation of departure and arrival piers to prevailing conditions, and limitations of ferries to travel at slower speeds.
- Passenger safety: Captain can maneuver the vessel to minimize wave effects. Crew duties include rough weather announcements and passenger safety management.

### **High Speed Ferry Operations (over 30 Knots)**

U.S. Coast Guard Navigation and Vessel Inspection Circulars (NAVIC) 5-01 and 5-01 Change 1 provide specific guidance for high speed passenger vessels and include approved vessel operation manuals, training programs and risk assessment tools (matrix).

- Vessel equipment: operators have exceeded minimum requirements for navigation electronics including dual radar, Global Position Satellite and electronic charting with Automatic Identification System overlay.
- Manning/Training: Vessels traveling at high speed are required to have a minimum of two qualified watch-standers during normal operations. Vessel operators have developed approved training programs for high speed navigation in compliance with NAVIC 5-01 and 5-01 Change 1.

Adopted February 2009. See Harbor Safety Plan Chapter XI: Small Passenger Vessels - Ferries for discussion.

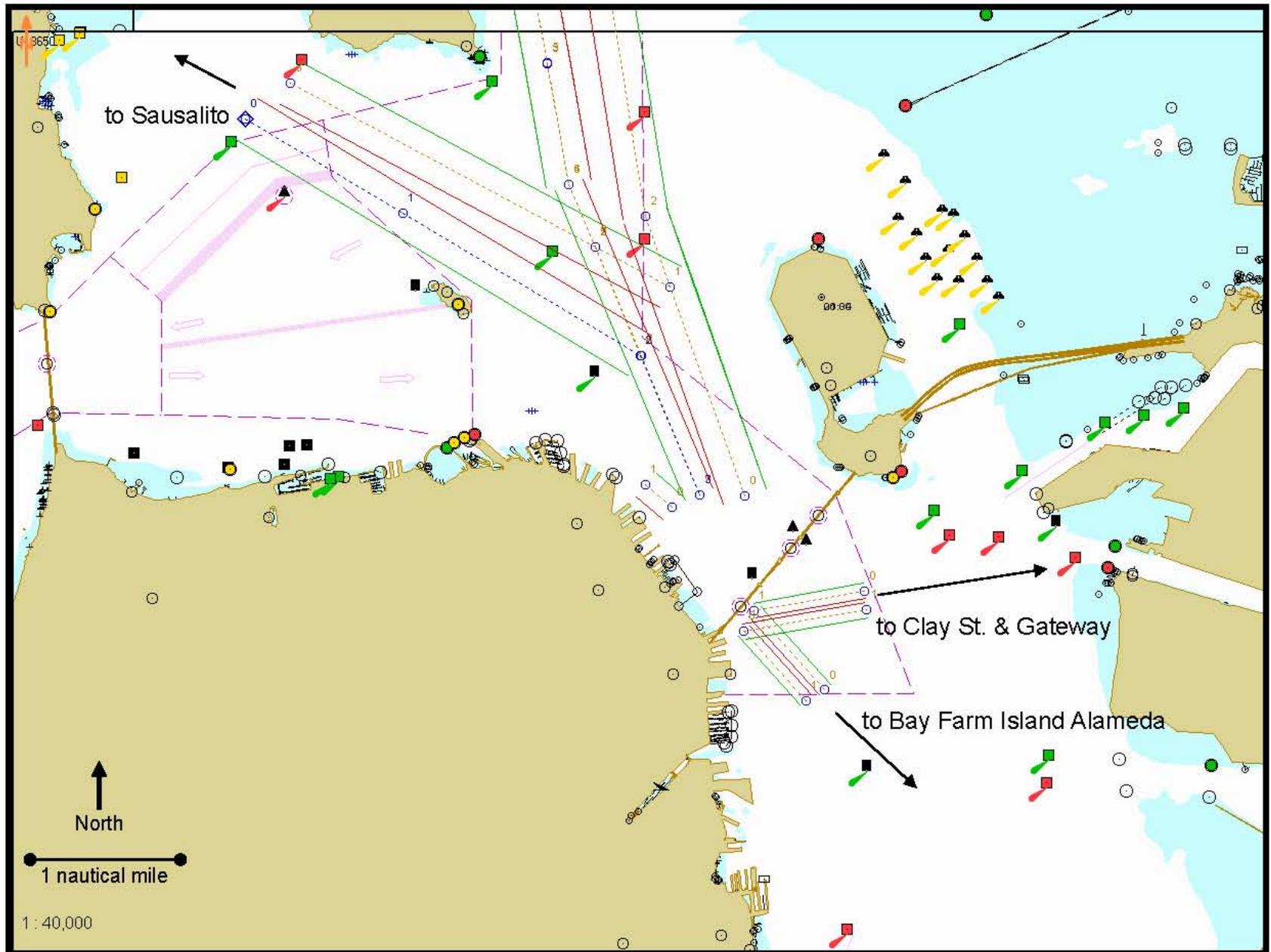
### **Passenger Ferry Traffic Routing Protocol**

To avoid future possible ferry collisions, particularly in light of expanded fast ferry service, a protocol for ferry navigation in the San Francisco and San Pablo Bays includes routes and a Ferry Building Approach Zone, as shown in Figures 1-7 below.

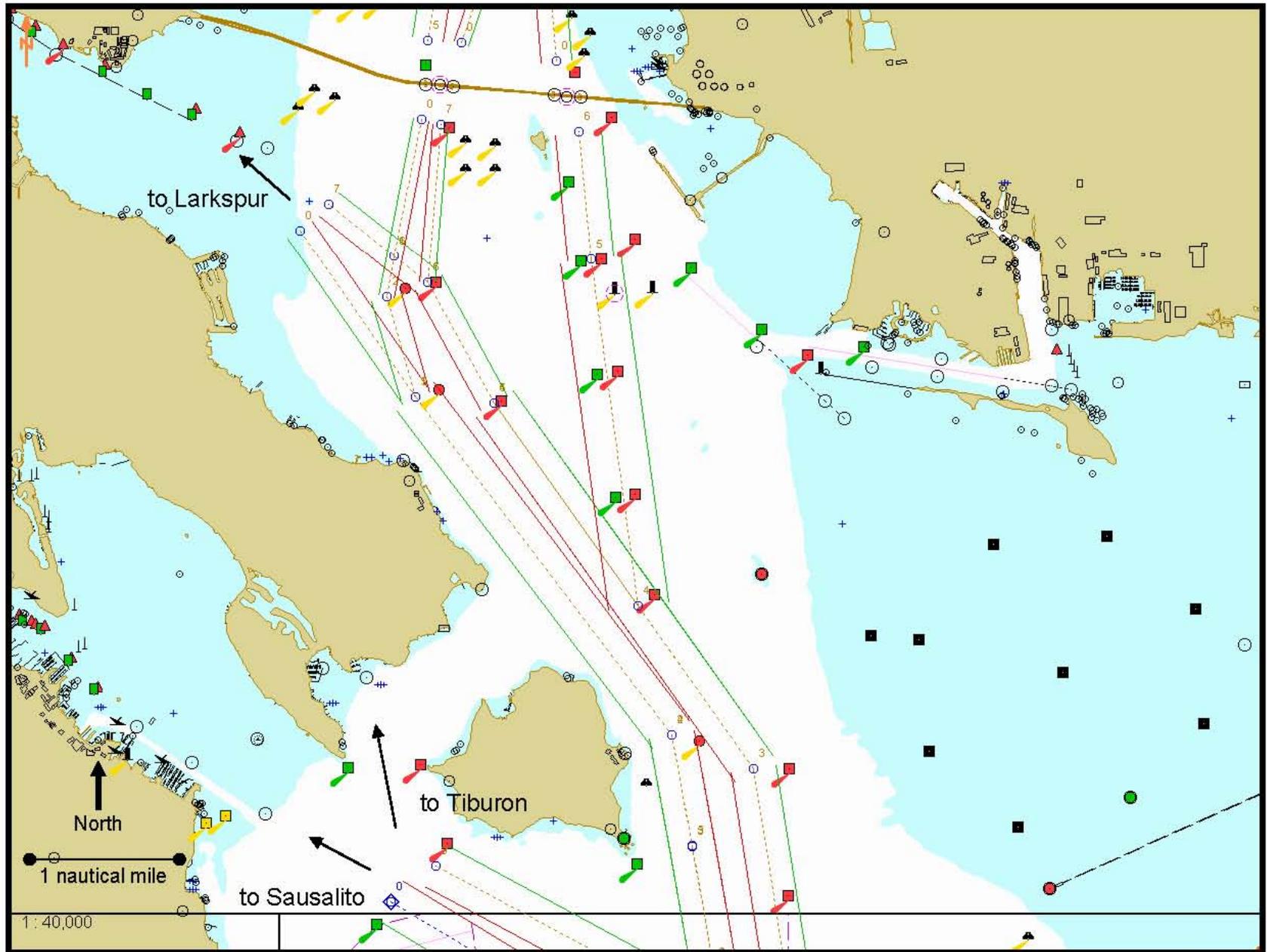
Adopted May 2008. See Harbor Safety Plan Chapter XI: Small Passenger Vessels - Ferries for discussion.



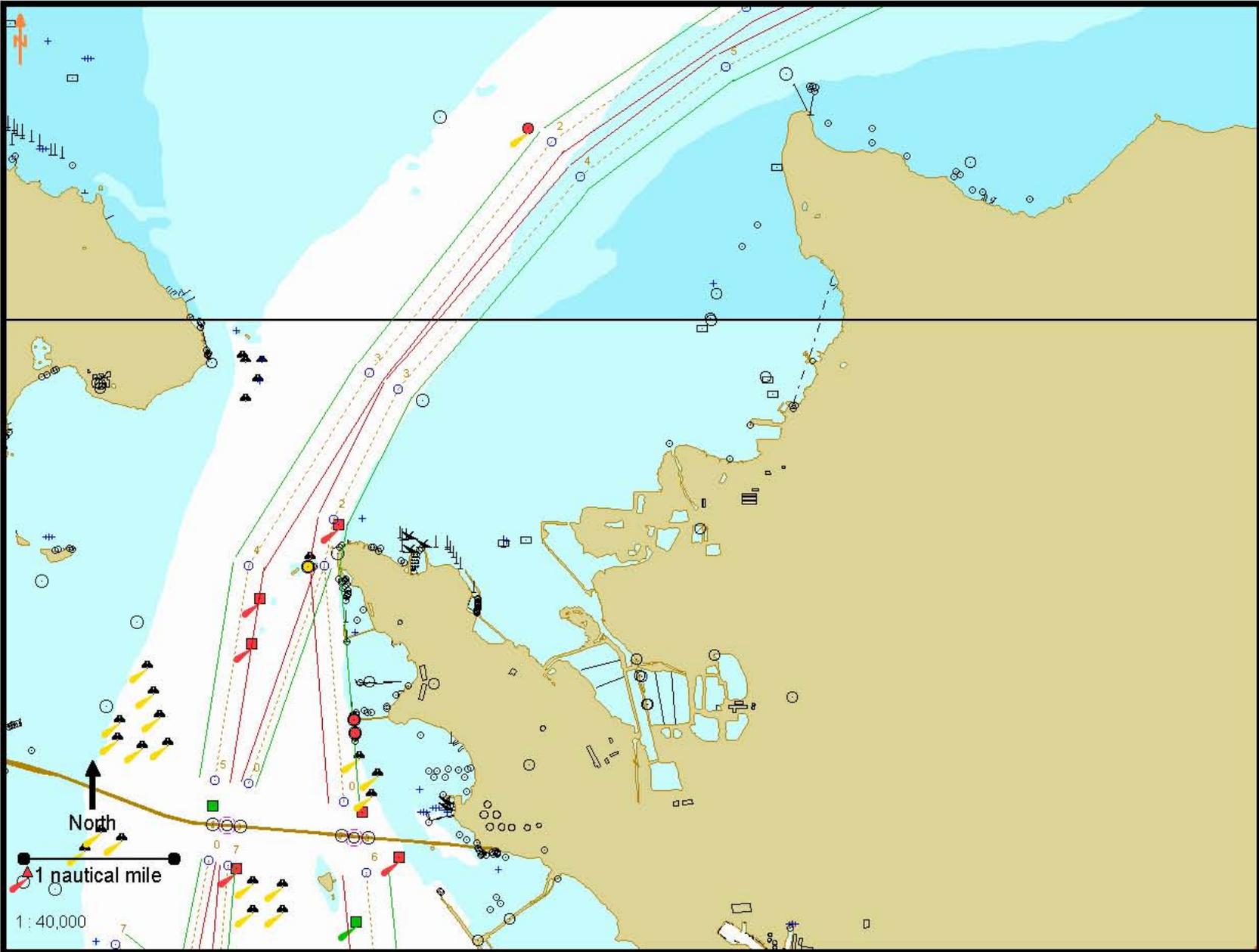
# Central Bay and South San Francisco Bay



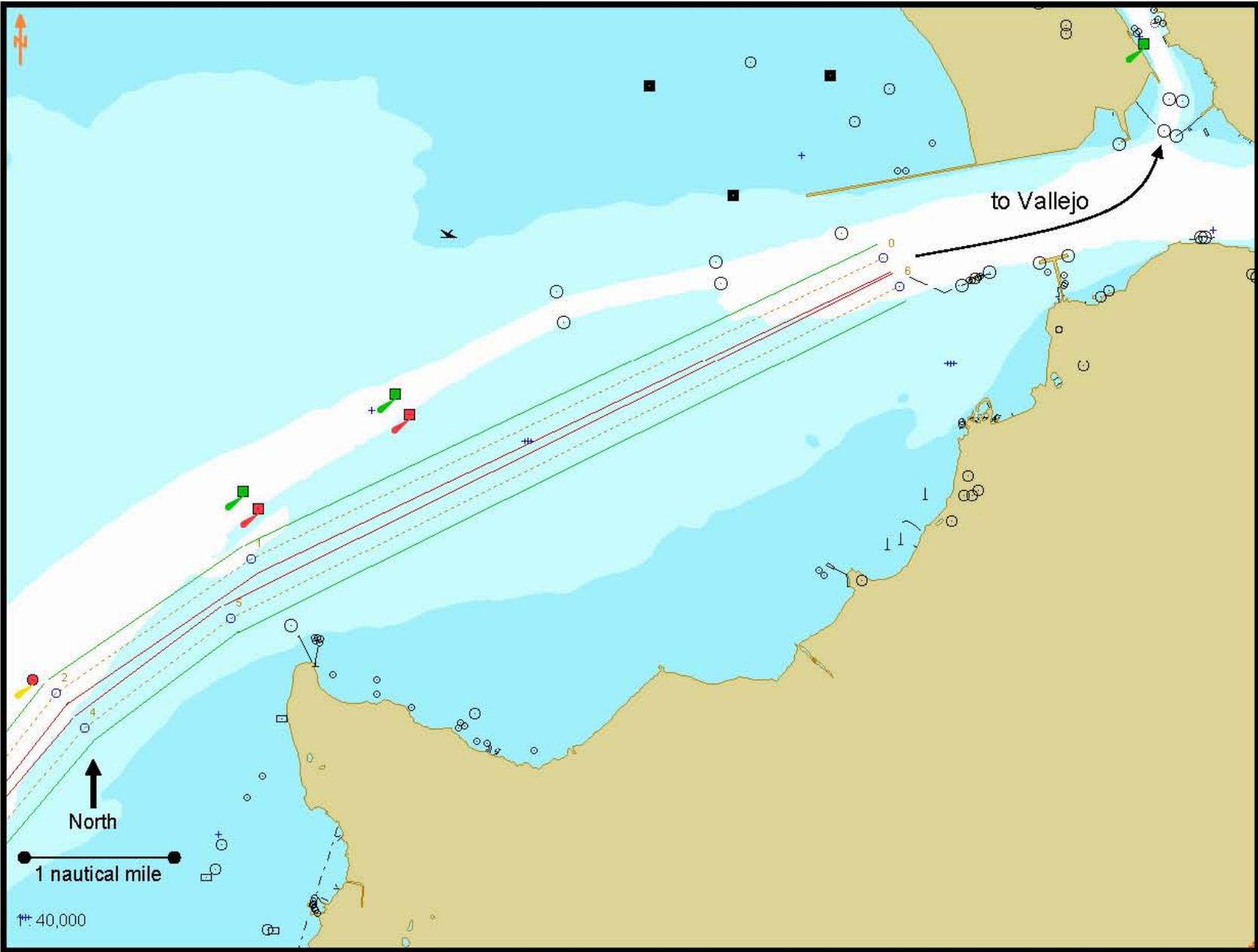
# North Channel and Southampton Shoal Channel



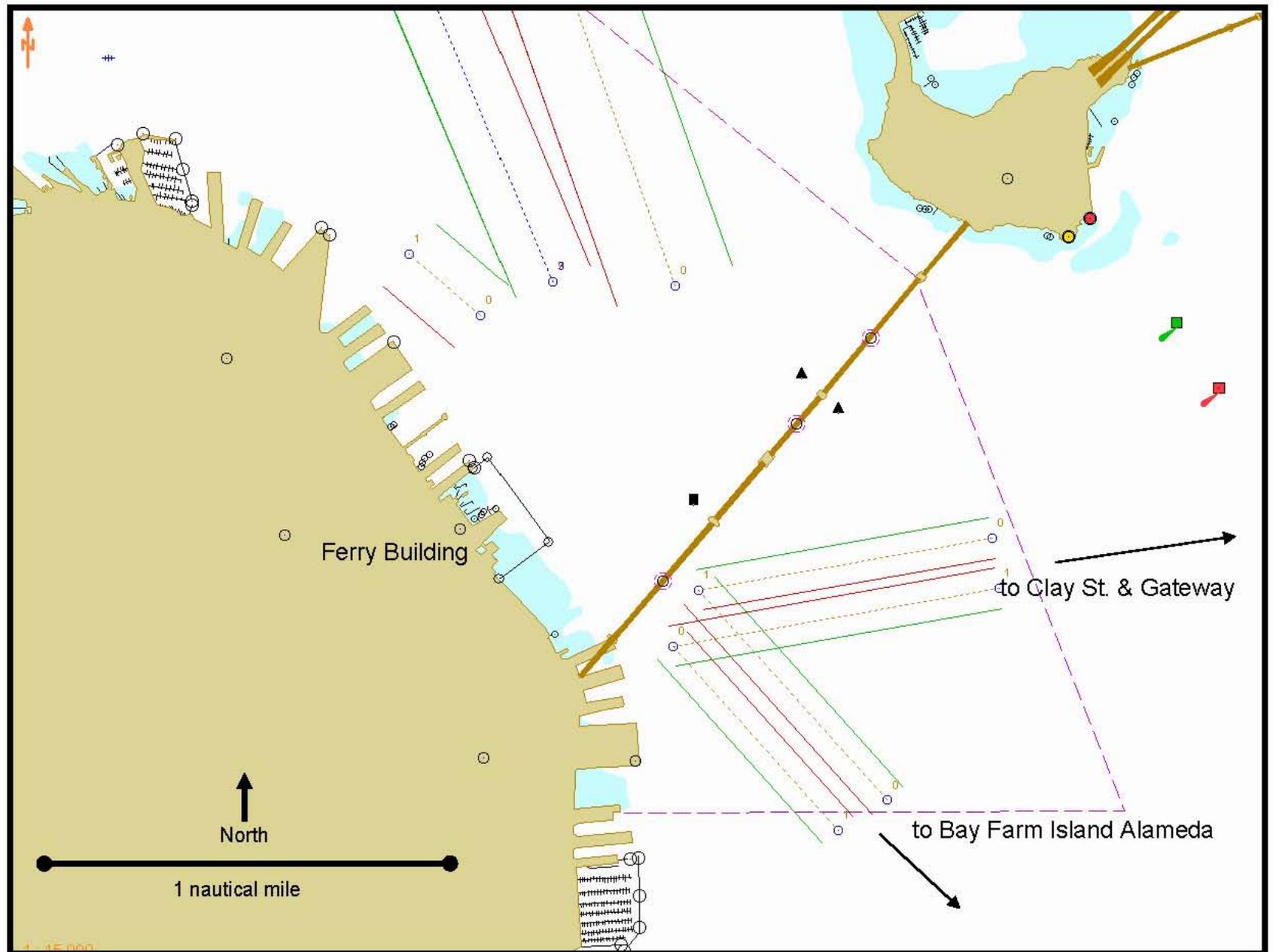
# San Pablo Strait Channel



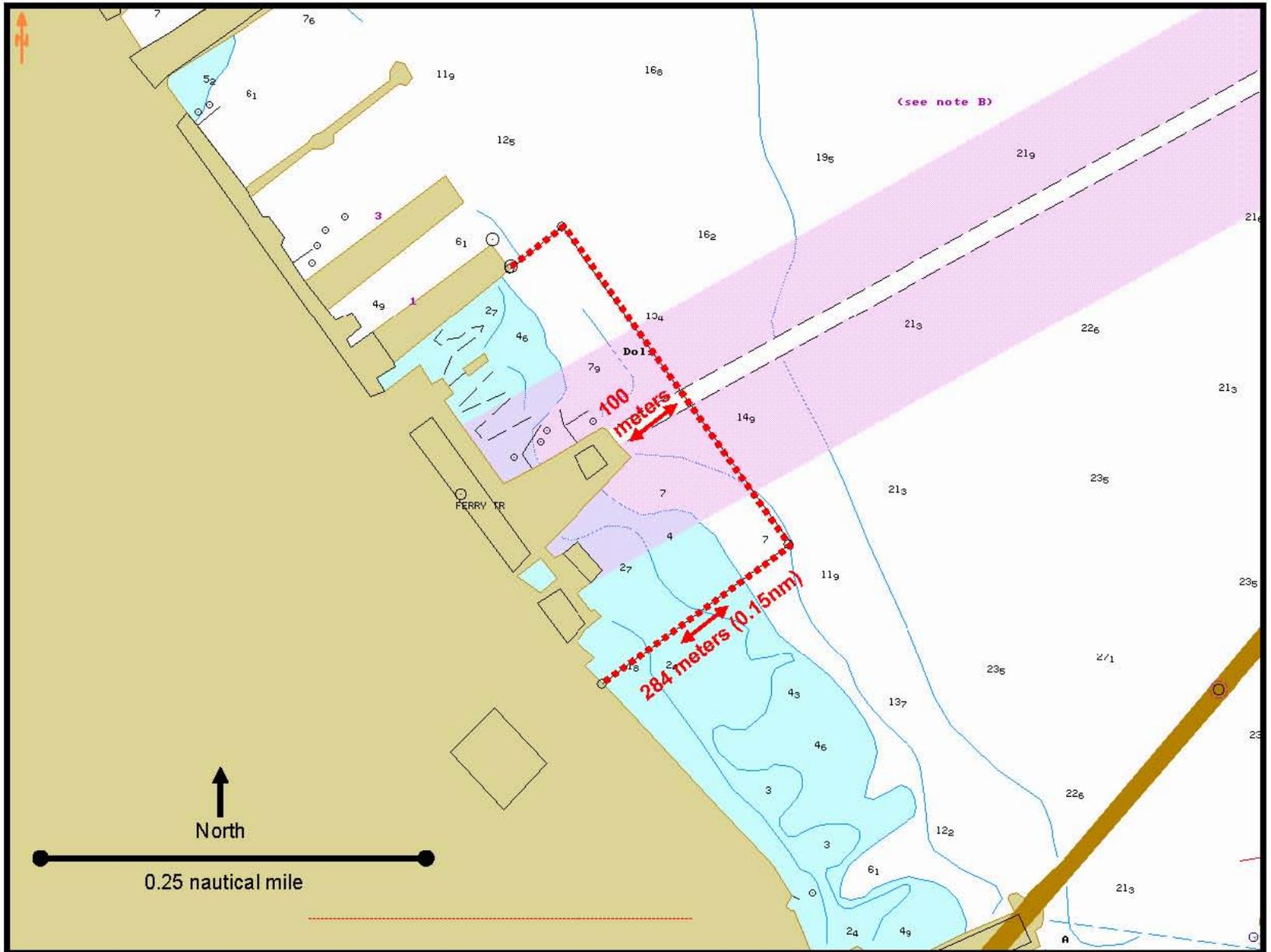
# San Pablo Bay and Mare Island Strait



# Ferry Building Approach/Departure Zone



# Ferry Building Maneuvering Area



# Source and Contact Information

Diagrams are screen print files from vector-based electronic nautical charts (ENCs).

Additional lines and labels were added to the screen print files for emphasis and clarity.

For more information contact:

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Training Director

Sector San Francisco Vessel Traffic Service

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## **Communication Procedures to Improve Safety During Bunker Barge Transfer Operations Alongside Container Vessels**

**Container Vessel Bunker Barge Safety Program and Delivery Notice.** This document outlines the process for essential communication between the agents, bunker barge operators (tankermen) and terminal's Marine Department to ensure a safe and productive work environment. The Container Operator has adopted this Best Management Practices Program and has instituted it to assist all parties involved in the vessel operations when vessel bunkering is involved in the operation.

The "Bunker Delivery Notice" appears at the end of this section. The Agent will e-mail the notice to the Ship, Terminal and the Bunker Barge operator prior to the stevedoring operation. The terminal, ship and barge operator will reply to the E-mail by including the contact phone/cell number of the person working that vessel/shift. This will be the cross check that all parties are aware of during a planned bunkering operation.

### **Essential Communications: Contact between the Tankerman and Terminal**

- The Bunker Barge Operator (Tankerman/Person in Charge (PIC)) must contact the Designated Facility Contact prior to beginning the barge operation.
- This will allow the Tankerman/PIC to learn the planned stevedore operation in the CFS/CLO and highlight any possible conflicts. (A Check Sheet shall be used for this function.)
- The Bunker Barge representative (Tankerman/PIC), must communicate with the Designated Facility Contact, and Chief Engineer/Chief Mate, (vessel PIC) prior to beginning the barge operation. This will allow the Tankerman to learn the planned stevedore operation and highlight any possible conflicts so they may be eliminated.

### **Essential Communications: Tankerman Check Sheet**

- a. What are the bay designations directly forward and aft of the house on this vessel that overlap the bunker barge?
- b. Is there any planned loading, discharging, or lashing in these bays?
- c. When does the terminal plan to work these bays?
- d. Is any of the work in these bays going to extend into the two or three offshore positions?
- e. Can these positions be worked in a specific time frame so possible conflicts are avoided?
- f. What time periods is the stevedore going to shut down cargo operations for breaks, lunch, etc.?

### **Understanding the Bunkering Process #1**

- Vessels contract for Bunkers
  - Oil Companies notify barge operators
  - Agents coordinate delivery notifications with barge operators and terminals
  - Bunker Barge arrival time and duration of pumping is established

### **Understanding the Bunkering Process #2**

- Vessel Arrives for Cargo Operations
- Agent Coordinates bunker barge arrival
- Terminal plans operations
- Cargo Flow Sheet or Crane letter of Operations (CFS or CLO) is prepared
  - Outlines what cargo is to be moved in what sequence
  - Terminal will plan around bunker operations if possible
- Terminal gives CFS/CLO to Agent to pass to Chief Engineer/PIC and Tankerman/PIC

### **Understanding the Bunkering Process #3**

- Bunker Barge Arrives for Bunker Ops
  - Optimal placement to minimize exposure.
  - Vessel insures BUNKER OPERATION SIGN is posted.
  - DOI is signed by Chief Engineer/PIC and Tankerman/PIC.
  - Tankerman/PIC /Chief Mate/Chief Engineer/PIC will have a copy of Cargo Flow Sheet or Crane letter (CFS/CLO).
- Tankerman/PIC should understand what cargo adjacent to the barge is to be handled and when.
- Tankerman/PIC shall have contact with the vessel Superintendent at all times.

### **Understanding the Bunkering Process #4**

- Vessel cargo operations commence.
  - Lashers sent aboard to unlash containers.
  - Crane lowered over hold/hatch to be worked.
- Work commences in accordance with CFS/CLO
  - Lashers sent aboard to re-lash containers
- Bunker operations could start before, during or after cargo operations
  - Tankerman/PIC, Chief Mate & Superintendent must understand where the stevedore operator is relative to the Cargo Flow Sheet or Crane letter and the bunkering process.

### **Area or Zone of Concern**

- Tankerman/PIC, Terminal Personnel, (Superintendents, Foremen, Lashers, Crane Operators) and Vessel Personnel (Chief Mate and Engineer/PIC) all must be mindful of and take particular care when lashing or cargo operations take place in the outer three stacks of containers in bays adjacent to the bunker barge if the transfer is in progress.

### **Essential Communications: Bunker Delivery Notice**

- To inform all concerned parties of the planned bunkering operations, the Vessel Agent (or other carrier assigned representative), will complete a “Bunker Delivery Notice”.
- The Agent will forward the notice by E-mail to BOTH the terminal and the bunker barge operator prior to the start of any stevedoring operation.

### **Post Incident Response**

- It is expected that the Tankerman will be alert to the crane working near the barge and the cargoflow that has been planned.
- It is expected that the Tankerman/PIC will determine the proper action to take regarding oil transfer process should any incident occur which affects the safety of the operation.
- Any incident will require direct communications between the parties involved who shall be readily available. This will allow for adjustments to working plans to correct conflicts.

### **Long Term Incident Resolution**

- It is expected that the Operations Department’s management personnel, vessel representative, and the barge operator will discuss mutually agreeable adjustments to minimize Tankerman exposures that may be determined as the result of the incident and the post incident investigation.
- Ideas and lessons learned will be shared among all parties including the other Port Terminals.

Adopted February 2009.

## Bunker Delivery Notice

<b>Date:</b>	<b>Port:</b>	
<b>Vessel:</b>	<b>Voyage:</b>	
<b>Reference #:</b>		
<b>Bunker Barge Co.</b>		
<b>&amp; Phone:</b>		
<b>Name of Bunker Barge:</b>		
<b>Name of Bunker Barge PIC:</b>		
<b>Contact Phone # of Barge PIC:</b>		
<b>Bunker Barge Emergency Contact #:</b>		
<b>Amount and type to be bunkered:</b>		
<b>Delivery Time of Bunkers:</b>		
<b>Location of Delivery of Bunkers:</b>		
<b>Bunker Barge to Land Side to as Vessel (select Port or Starboard):</b>	<b>Port</b>	<b>or Starboard</b>
<b>Estimated duration of bunker delivery:</b>		
<b>Designated Facility Contact:</b>		
<b>Terminal Emergency Phone #:</b>		
<b>Name of Vessel PIC for bunkers:</b>		
<b>Telephone number of vessel:</b>		
<b>Location of Bunker Manifold/Riser:</b>		
<b>Agent for Vessel:</b>		
<b>Agent Cell Phone #:</b>		
<b>Agent 24 Hour Contact #:</b>		

## Harbor Safety Committee Members

### Members

### Alternates

#### Port Authorities

*Term expire on December 31, 2012*

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*Term expire on June 13, 2010*

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## Harbor Safety Committee Members

### **Members**

*Term expire on January 9, 2011*

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### **Alternates**

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### **Pleasure Boat Operators**

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### **Tanker Operators**

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## Harbor Safety Committee Members

### Members

### Alternates

#### Tanker or Marine Oil Terminal Operators

*Term expire January 9, 2011*

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Captain Esam Amso  
West Coast Manager Marine Assurance/Loss Control  
Valero Marketing and Supply Company  
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#### Dry Cargo Operators

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Captain David Hobbs  
Senior Surveyor  
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## Harbor Safety Committee Members

### **Members**

### **Alternates**

#### Labor Organizations

*Term expire on June 13, 2010*

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Captain Ray Shipway  
Branch Agent  
Int'l Org. of Masters Mates & Pilots  
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Fax: (415) 543-2533  
E-mail: [rshipway@bridgedeck.org](mailto:rshipway@bridgedeck.org)

#### Barge Operators

*Term expire on June 13, 2010*

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#### Tug Operators

*Term expire on June 13, 2010*

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## Harbor Safety Committee Members

### Members

### Alternates

#### Non-Profit Environmental Organizations

*Term expires on February 25, 2011*

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*Term expires on July 12, 2009*

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#### Pilots Organizations

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Captain Peter Mclsacc  
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## Harbor Safety Committee Members

### **Members**

### **Alternates**

#### Commercial Fishing Representative

*Term expire on December 27, 2010*

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#### San Francisco Bay Conservation and Development Commission

*Term expires on January 9, 2011*

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### Members

### Alternates

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**HARBOR SAFETY COMMITTEE OF THE SAN FRANCISCO BAY REGION  
INCLUDING THE PORTS OF SACRAMENTO AND STOCKTON**

**BYLAWS**

**Article I: Name**

Section 1. The Harbor Safety Committee of the San Francisco, San Pablo and Suisun Bays, including the Ports of Sacramento and Stockton (hereinafter referred to as the Committee).

**Article II: Purpose**

Section 1. The Committee is established pursuant to Section 8670.23 of the Government Code and Title 14, California Code of Regulations, Sections 800-802; and is responsible for planning for the safe navigation and operation of tank ships, tank barges, and other vessels within the harbor, and making recommendations to the Administrator of the Office of Spill Prevention and Response (OSPR), hereinafter referred to as the Administrator.

**Article III: Membership**

Section 1. Membership Categories

- a. Members shall be selected from local representatives of organizations or companies in the San Francisco Bay Area region (including the Ports of Sacramento and Stockton) whenever possible.
- b. The Committee shall consist of members appointed by the Administrator as follows:
  1. Four designees representing Port authorities: One representative shall be selected from the Port of San Francisco and one from the Port of Oakland. The other two representatives shall be selected from any two of the remaining ports: Richmond, Redwood City, Benicia, Stockton or Sacramento;
  2. One representative of tank ship operators, and one representative of either a tank ship operator or a marine oil terminal operator;
  3. One designee of the San Francisco Bar Pilots Association;
  4. Two representatives of dry cargo vessel operators;

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5. One representative of commercial fishing;
  6. One representative of pleasure boat operators;
  7. One representative of a recognized nonprofit environmental organization that has as a purpose the protection of marine resources;
  8. One designee of the San Francisco Bay Conservation and Development Commission;
  9. One representative from a recognized labor organization involved with waterborne operations of vessels;
  10. One representative of tug operators and one representative of tank barge operators, neither of whom shall also be engaged in the business of operating either tank ships or dry cargo vessels.
  11. One designee from each of the following: Captain of the Port from the U.S. Coast Guard; U.S. Army Corps of Engineers, U.S. National Oceanic and Atmospheric Administration (NOAA), and the U.S. Navy, to the extent that each consents to participate on the Committee as a non appointed member.
- c. Appointees filling membership categories identified in items b1 through b10, above, are specified as appointed members.

### Section 2. Membership Qualifications

The members appointed from the categories listed in Section 1b (2), (3), (4), and (10) above shall have navigational expertise. An individual is considered to have navigational expertise if the individual meets any of the following conditions:

- a. Has held or is presently holding a Coast Guard Merchant Marine Deck Officer's license;
- b. Has held or is presently holding a position on a commercial vessel that includes navigational responsibility;
- c. Has held or is presently holding a shore side position with direct operational control of vessels;
- d. Has held or is currently holding a position having responsibilities relating to the safe navigation of vessels.

### Section 3. At-Large Members

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The Harbor Safety Committee may petition the Administrator to request up to five at-large membership categories that are needed to conduct the Harbor Safety Committee's business and which reflect the make-up of the local maritime community. One at-large member shall represent ferry operators who shall have navigational expertise as defined in Section 2, above, and who is specified to be an appointed member consistent with Section 1c, above. The Committee may also petition the Administrator for the removal of any at-large membership category. The approval of such petitions shall be at the sole discretion of the Administrator.

### Section 4. Term of Membership for Appointed Members and their Alternates

- a. A member shall be appointed for a three-year term.
- b. A member's appointment shall be terminated as a result of any of the following circumstances:
  1. The member retires from, or otherwise leaves employment under which he was appointed. Members who leave their employer may, if qualified under their new employment, apply for the seat they vacated or, if qualified, apply for another Committee seat that becomes vacant.
  2. The member undergoes a change in work responsibilities, which alters the constituency that he represents, or alters his qualifications for the position.
  3. The member voluntarily resigns for any reason.
  4. A member is removed by the Administrator for any reason under Section 7, below.
- c. A member impacted by any of the conditions identified in items 1-4 above is expected to submit his resignation to the Chair (with a copy to the Administrator) within five working days.
- d. Any incumbent completing his three-year term may re-apply.
- e. Except as noted in Section 5c, below, an alternate's term expires when the primary member leaves service for any reason.

### Section 5. Alternates for Appointed Members

- a. The alternate representative shall be appointed and sworn by the Administrator in a manner similar to the primary member. Only one alternate shall be appointed for each primary member, and only the appointed alternate is accorded proxy powers. The alternate shall be selected from the same membership category as the primary member, and shall meet the same qualifications. The appointed alternate may vote, participate in, or take any other action on behalf of the primary member consistent with the Committee's bylaws and any applicable statutory or regulatory provisions.
- b. An alternate may vote only in the absence of the primary member.
- c. When a primary member resigns or is removed, his alternate may continue to serve until such time as the new primary member is appointed and sworn in.

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- d. The Committee offers the Administrator the following guidelines for appointing alternates:
  1. When possible, the primary member should be allowed to recommend his alternate;
  2. If there is more than one applicant for a position, the primary member and Administrator should consider the other applicants when selecting alternates. The Committee requests the Administrator consider diversity of organizations within each membership category when selecting alternates.

### Section 6. Attendance of Appointed Members

- a. Attendance of scheduled Committee meetings is expected. The standard of attendance is determined as follows:
  1. For each appointed membership category team consisting of a primary member and alternate, meeting either condition (a) or (b) is considered to be not meeting the standard of attendance:
    - (a) The primary member of the team missing four consecutive meetings, or a total of six meetings in a calendar year.
    - (b) The team missing three consecutive meetings, or a total of four meetings in a calendar year.
  2. For a primary member with no alternate, meeting condition (a) is considered to be not meeting the standard of attendance:
    - (a) Missing four consecutive meetings, or a total of six meetings in a calendar year.
- b. The Committee Chair shall review the meeting attendance records on a regular basis and shall inquire about members and teams with excessive absences.
- c. The Chair may make an exception to the attendance standards for a member experiencing extenuating circumstances.

### Section 7. Appointed Member Removal

- a. Circumstances may arise which require that a Committee member voluntarily resign or be removed from their position. Such events include:
  1. Failing to meet the attendance standards, as set in Section 6,
  2. Falsifying application materials,

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3. The member's term ending prematurely due to meeting one of the conditions described in Article III, Section 4, items b1 and b2.

b. A member who demonstrates any of the three criteria listed above is expected to voluntarily tender his written resignation to the Chair (with a copy to the Administrator) within five working days of being informed of this condition. If the expected resignation is not forthcoming, the Chair shall privately contact the member, explain which bylaw(s) has been violated, and seek the member's written resignation. If the request is not honored within ten working days, the Chair shall write to the member (with a copy to the Administrator), explaining which bylaw(s) has been violated and, again, request a written resignation. If the resignation is not offered within 15 working days the Chair shall notify the Administrator in writing (with a copy to the member) of the situation, identify which bylaw(s) has been violated, and seek the Administrator's assistance in removing the recalcitrant member.

c. The Chair shall announce at the next full meeting the resignation or removal of any member.

### **Article IV: Officers**

Section 1. The Administrator shall appoint a Chairperson for the Committee from the membership specified in Article III.

Section 2. The Administrator shall appoint a Vice-chairperson for the Committee from the membership specified in Article III, from a membership category other than that of the Chairperson.

Section 3. An Executive Secretary (Secretariat) for the Committee shall be contracted by the Administrator. The Secretariat shall serve as the Administrative staff to the Committee.

### **Article V: Subcommittees and Work Groups**

Section 1. The Committee may establish Subcommittees and Work Groups, as it deems necessary. Meetings shall be duly noticed and open to the public in accordance with Article VII to receive maximum participation.

Section 2. The Chair of the Harbor Safety Committee shall appoint the chairperson of Subcommittees and Work Groups. The Chair may appoint Subcommittee members.

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Section 3. Subcommittees should be composed of an uneven number of voting Committee members with no fewer than three people on a subcommittee. Vote by the majority of the subcommittee members present shall be necessary to pass a recommendation of the subcommittee. If a majority of Committee members are voting at a subcommittee meeting, that meeting should be noticed as a meeting of the full Harbor Safety Committee.

Section 4. Work Groups may be composed of any number of participants. Work Groups should operate by consensus of those present, including interested members of the public.

Section 5. Subcommittees and Work Groups may make recommendations to the full Committee, which will vote on the recommendations as detailed in Article VIII. Recommendations should be made in writing and provided to the Committee prior to any vote on the matter.

### **Article VI: Recommendations from Committee**

Section 1. The Committee shall make recommendations or requests to the Administrator on rules, regulations, guidelines and policies on Harbor Safety. The Committee may make recommendations or requests to other federal, state or local agencies.

Section 2. The Committee shall prepare and submit a Harbor Safety Plan and annual updates to the Administrator by July 1 of each year or as directed otherwise by the Administrator.

### **Article VII: Meetings**

Section 1. Governing rules for meetings shall be the Ralph M. Brown Act (Open Meetings for Local Legislative Bodies), the San Francisco Bay Region HSC bylaws, and Robert's Rules of Order.

Section 2. Each Committee member and alternate shall be provided a copy of the San Francisco Bay Region HSC bylaws and the Harbor Safety Plan. Upon request, Committee members and alternates, as well as interested parties, shall be provided a copy of the Brown Act.

Section 3. The Committee normally meets at 10:00 a.m. on the second Thursday of each month and rotates meeting locations to include the Ports of Oakland, Richmond and San Francisco or other relevant locations within the San Francisco Bay Region.

Section 4. Quorum

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In order for a meeting to take place, a quorum of appointed members or their alternates consisting of nine (9) individuals shall be present. Should a quorum not be present, the Committee can proceed as a committee of the whole, take public testimony, receive input on any agenda item duly noticed, but cannot take action on any item.

### Section 5. Agenda for Meetings:

- a. An agenda drafted by the Secretariat in consultation with the Committee Chair shall be prepared for each meeting of the Committee. The agenda shall be distributed to members, alternates, and interested parties no fewer than seven (7) days prior to the scheduled meeting and shall comply with all provisions of the Brown Act.
- b. In accordance with the Brown Act, agendas for full Committee meetings, and the schedule of upcoming workgroup and subcommittee meetings shall be posted 72 hours in advance at the Secretariat Offices. Postings shall be visible from the outside of building.
- c. Agendas shall include a brief general description of each item to be discussed, including whether a voting action is to be taken on an item.
- d. Each agenda item that requires Committee action shall include time for public comment.
- e. The Committee may take action on an item not appearing on the agenda by determining that an immediate need exists and it came to the attention of the Committee after the agenda was distributed. This determination must be approved by a two-thirds ( $2/3^{\text{rd}}$ ) vote of all appointed Committee members or, if less than two-thirds ( $2/3^{\text{rd}}$ ) of all appointed members are in attendance, by a unanimous vote of those appointed members present.
- f. A Committee member or member of the public may discuss an item not on the agenda under New Business/Public Comments. However, no action by the Committee can be taken until such time as the item is duly noticed at a regular or special meeting, and time has been allotted to receive public input prior to Committee action.

## **Article VIII: Voting**

### Section 1. Voting

- a. The San Francisco Bay Region Harbor Safety Plan annual review shall be approved by two-thirds ( $2/3^{\text{rds}}$ ) of the appointed Committee members or their alternates.

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- b. With the exception of items specified in Section 1a of this Article, Article VII, Section 5 e, and Article IX, passage of any item subject to a vote by Committee members shall require a simple majority of appointed members, or their alternates, present at a meeting. No action shall be taken on any item that is not on the agenda provided pursuant to Article VII, Section 5, except as allowed by Article VII, Section 5e.
- c. Due to the advisory nature of the Committee and its selected representatives, members shall not be excused from voting in case of potential conflict of interest.

### **Article IX: Bylaws Review, Acceptance and Amendments**

#### Section 1. Enactment or Amendment of Bylaws

To enact or amend the bylaws, the proposed bylaws must be:

- a. Included as an agenda item at a regular meeting.
- b. Noticed to the public in accordance with provisions of Article VII, Section 5, of these bylaws.
- c. Be approved by two-thirds (2/3rds) of the appointed Committee members or their alternates.

#### Section 2. Bylaws Status

- a. The bylaws shall become effective after Committee approval and shall continue in force until amended or repealed.

### **Article X: Certification**

I certify that these bylaws were approved by the Harbor Safety Committee of the San Francisco, San Pablo and Suisun Bays, including the Ports of Sacramento and Stockton, on October 9, 2003, at Richmond, California, by a vote of 16 yea to 0 nay. This document is true and correct, and constitutes the official bylaws governing the Committee. These bylaws shall remain in force until amended or repealed in accordance with Article IX.

**CALIFORNIA CODE OF REGULATIONS  
TITLE 14, DIVISION 1  
SUBDIVISION 4, OFFICE OF OIL SPILL PREVENTION AND  
RESPONSE  
CHAPTER 3. OIL SPILL PREVENTION AND RESPONSE  
PLANNING  
SUBCHAPTER 1. HARBOR SAFETY COMMITTEES  
AND HARBOR SAFETY PLANS**

**SECTIONS 800 - 802**

**Effective 2/9/05**

**800. DEFINITIONS**

In addition to the definitions in Chapter 1, Section 790 of this Subdivision, the following definitions shall govern the construction of this subchapter. Where similar terms are defined, the following will supersede the definition in Chapter 1:

- (a) "Vessels" means any watercraft or ship of any kind, including every structure adapted to be navigated from place to place for the transportation of merchandise or persons.

**NOTE: Authority cited: Section 8670.23, Government Code.  
Reference: Sections 8670.3, 8670.21 and 8670.23, Government Code.**

**800.5. HARBOR SAFETY COMMITTEES**

- (a) The Administrator shall create harbor safety committees for the harbors and adjacent regions of San Diego Bay; Los Angeles/Long Beach Harbor; Port Hueneme; San Francisco, San Pablo, and Suisun Bays; and Humboldt Bay. In consultation with each harbor safety committee, the Administrator shall determine its geographic region of responsibility which shall be clearly reflected in the committee's plan as described in Section 802(b)(2) of this Subchapter.
- (b) In the event that a designee of a port authority is not able to participate as a harbor safety committee member due to military affiliations, the civilian counterpart for that harbor may serve in place of the port authority designee.

## Appendix D

- (c) All meetings of harbor safety committees, their subcommittees, workgroups or organizations, as defined in Government Code Section 54952, are subject to the open meeting requirements contained in Government Code Sections 54950 through 54962.

**NOTE: Authority cited: Sections 8670.23 and 8670.23.1, Government Code.  
Reference: Section 8670.23, Government Code.**

### **800.6. HARBOR SAFETY COMMITTEE MEMBERSHIP**

- (a) The Administrator shall appoint to each harbor safety committee, for a term of three years, all of the following members and their alternates:
- (1) A designee of each of the port authorities within the region, except that the harbor safety committee for the San Francisco, San Pablo and Suisun Bay region shall have four designees.
  - (2) A representative of dry cargo vessel operators, except that the harbor safety committee for the San Francisco, San Pablo and Suisun Bay region may have two representatives.
  - (3) A representative of tank ship operators, except that the harbor safety committee for the San Francisco, San Pablo and Suisun Bay region shall have one additional representative of either tank ship operators or marine oil terminal operators.
  - (4) For the harbor safety committees for the Los Angeles/Long Beach Harbor region, Port Hueneme region, and Humboldt Bay region a representative of marine oil terminal operators.
  - (5) A representative of tug or tank barge operators, who is not also engaged in the business of operating either tank ships or dry cargo vessels, except that the harbor safety committees for the San Francisco, San Pablo and Suisun Bay region and Humboldt Bay region shall have one representative of tug operators and one representative of tank barge operators, neither of whom is also engaged in the business of operating either tank ships or dry cargo vessels.
  - (6) For the harbor safety committees for the San Francisco, San Pablo and Suisun Bay region, Los Angeles/Long Beach Harbor region and San Diego Bay region, a representative of scheduled passenger ferry or excursion vessel operators.

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- (7) A representative of the pilot organizations within the region, except that the harbor safety committee for the Los Angeles/Long Beach Harbor region shall have two pilot representatives: one a designee of the Port of Los Angeles pilot organization and one a designee of the Port of Long Beach pilot organization. Additionally, the harbor safety committee for the Los Angeles/Long Beach Harbor region shall have one representative of mooring masters who represents all mooring masters operating within the committee's geographic area of responsibility.
  - (8) A representative of a recognized labor organization involved with operations of vessels.
  - (9) A representative engaged in the business of commercial fishing.
  - (10) A representative of pleasure boat operators or a recreational boat organization.
  - (11) A representative of a recognized nonprofit environmental organization that has as a purpose the protection of marine resources, except that the harbor safety committee for the Los Angeles/Long Beach Harbor region may have two representatives .
  - (12) The United States Coast Guard Captain of the Port and a designee of each of the following federal agencies to the degree that each consents to participate on the committee: the United States Army Corps of Engineers, the National Oceanographic and Atmospheric Administration, and the United States Navy.
  - (13) A designee of the California Coastal Commission, except for the harbor safety committee for the San Francisco, San Pablo and Suisun Bay region, where the Administrator shall appoint a designee of the San Francisco Bay Conservation and Development Commission.
- (b) A harbor safety committee may petition the Administrator with a request for new or additional membership positions for special needs to conduct ongoing harbor safety committee business and which reflect the makeup of the local maritime community. The qualifications for such positions shall be set either in committee bylaws or on the petition. The approval of such petitions shall be at the sole discretion of the Administrator.
  - (c) A harbor safety committee may petition the Administrator for the elimination of new or additional membership positions requested and approved pursuant to Subsection (b). The approval of such petitions shall be at the sole discretion of the Administrator.

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- (d) The members appointed from the categories listed in Subsections (a)(2), (3), (4), (5),(6), and (7) above shall have navigational expertise. An individual is considered to have navigational expertise if the individual meets any of the following conditions:
- (1) Has held or is presently holding a United States Coast Guard Merchant Marine Deck Officer's license.
  - (2) Has held or is presently holding a position on a commercial vessel that includes navigational responsibilities.
  - (3) Has held or is presently holding a shoreside position with direct operational control of vessels.
  - (4) Has held or is currently holding a position having responsibilities for permitting or approving the docking of vessels in and around harbor facilities.
- (e) The Administrator shall appoint a chairperson and vice chairperson, for a term not to exceed the balance of their current membership appointment, for each harbor safety committee from the membership specified in Subsection (a) above. The Administrator may withdraw such appointments at his or her sole discretion.
- (f) Upon request of the committee chairperson, pursuant to the committee's bylaws, the Administrator may remove a member or alternate appointed under authority of Subsection (a) above.

**NOTE: Authority cited: Sections 8670.23 and 8670.23.1, Government Code.  
Reference: Section 8670.23, Government Code.**

### **801. GENERAL PROVISIONS**

- (a) Each harbor safety committee shall be responsible for planning for the safe navigation and operation of vessels within its geographic region of responsibility. As part of meeting this responsibility, each committee shall prepare and submit to the Administrator its harbor safety plan which encompasses all vessel traffic within its region and addresses the region's unique safety needs.
- (b) All harbor safety plans shall be consistent with both the California Oil Spill Contingency Plan and the National Contingency Plan.

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- (c) All harbor safety plans shall be in writing and shall include a reference to any federal, state or local laws or regulations if those laws or regulations were relied upon to develop the plan.
- (d) Harbor safety plans which meet the requirements of this subchapter shall be implemented by the Administrator in consultation with the respective committee.
- (e) On or before July 1 of each year, each harbor safety committee shall assess maritime safety or security within its region, including tank vessel safety, and shall report its findings and recommendations for improvements to the Administrator by amending its current harbor safety plan or instituting other alternatives to address its findings. All plans shall be reviewed by the Administrator to ensure their compliance with this subchapter.
- (f) The Administrator may direct a harbor safety committee to address any issue affecting maritime safety or security, as appropriate, and to report findings and recommendations on those issues.

**NOTE: Authority cited: Sections 8670.23 and 8670.23.1, Government Code.  
Reference: Section 8670.23, Government Code.**

### **802. HARBOR SAFETY PLAN CONTENT**

- (a) All harbor safety plans shall be written in consideration of the best achievable protection standard as that term is defined in Chapter 1 of this subdivision.
- (b) Each harbor safety plan shall include, at a minimum, a discussion of the following:
  - (1) Tug Escorts
    - (A) One section of the plan shall be dedicated to the usage of tug escorts in the committee's geographic region of responsibility.
    - (B) This section shall allow for a case-by-case determination of tug escort usage or need based on specified criteria which include, but are not limited to, all of the following factors:
      - 1. the physical limitations of the tugs;
      - 2. an analysis of commonly encountered weather and sea conditions including, but not limited to, wind, tidal and ocean currents;

## Appendix D

3. the type of cargo carried by the tank vessel;
  4. a determination of whether or not tug escorts are needed for unladen tank vessels; and
  5. the effectiveness of tug escorts in steering and/or stopping assistance for heavily laden tank vessels given the geographic and navigational limitations of that region.
- (C) This section shall also include, but not be limited to, all of the following:
1. an outline discussing tug boat capabilities when assisting a tank vessel;
  2. a recommendation determining when tank vessels must be escorted by
  3. a determination of sufficient size, horsepower, and pull capacity of the tug(s) to assure maximum assistance capability;
  4. a comprehensive inventory of the number and types of tugs available for tank vessel escort in each geographic region; and
  5. an analysis, including factual data and studies relating to the analysis, which specifies the incidence and location of accidents and the effects of the absence or presence of tug escorts at the time of those accidents.
- (D) Each plan shall address its method for performing a continued study of tug escorts, which will rely in part on relevant information solicited by the harbor safety committee from pilots, masters, representatives from towing industries and builders, and other interested parties.

### (2) Geographic Region of Responsibility

This section shall provide a written description of each committee's geographic region of responsibility and shall include a large scale chart, or chartlet, illustrating the entire region. The geographic region of responsibility described and illustrated shall be the one approved by the Administrator as outlined in Section 800.5(a) of this Subchapter.

### (3) Regional Harbor Conditions

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This section shall provide:

- (A) a description of existing and expected conditions of weather, tidal ranges, tidal currents (directions and velocities) and other factors which might impair or restrict visibility or impact vessel navigation;
- (B) a description of the procedures for routing vessel traffic, and any contingency or secondary routing plans which may be used during construction and dredging operations;
- (C) a description of limitations of current anchorages (designations, proximity to heavily used fairways or channels) and any plans, if developed, to address those limitations; and
- (D) a description of the current channel design (navigable channel width and advertised dredged depth) and any proposed changes to these plans.

### (4) Vessel Traffic Patterns

This section shall provide, to the greatest extent possible:

- (A) A description of the types of vessels which call on the ports or facilities within the region; and
  1. identification of the types of cargo transported on the vessels; and
  2. a determination of the amount of oil annually (using a three year average) shipped into or from the ports or facilities within the region.
- (B) a history and types of all accidents and near-accidents which have occurred within the region during the past three years and any corrective actions or programs taken to alleviate recurrences. For purposes of this subsection, "near-accident" shall mean all situations where a risk of collision as defined by 33 USC 2007 existed;
- (C) an assessment of current safety problems or conflicts with small vessels, sailing vessels, or vessels engaged in fishing as it relates to violation of Rule 9 (Narrow Channels Rule) of the Inland Navigational Rules Act (33 USC 2009);
- (D) current procedures for routing vessels during emergencies or other contingencies which impact navigation;
- (E) a review of existing and proposed federal, state and local laws, regulations or ordinances affecting the region to determine a need for any change;

## Appendix D

(F) an assessment of the need for establishing or upgrading existing educational or public awareness programs for all waterway users.

### (5) Aids to Navigation

This section shall:

(A) describe any fixed navigational hazards specific to the region and aids to navigation systems in place to minimize risk of contact with these hazards;

(B) evaluate the existing aids to navigation systems available to each region as established and maintained by the United States Coast Guard or other navigational aids as permitted by the United States Army Corps of Engineers, and determine the need for any changes; and

(C) evaluate current programs to determine accurate depth information in navigable channels, anchorages and berths used by tank vessels, and make recommendations necessary to increase the accuracy of such information.

### (6) Communication

This section shall:

(A) review and evaluate the adequacy of current ship-to-ship and ship-to-shore communication systems used in the region;

(B) identify any low propagation, or silent areas within the region;

(C) if communication deficiencies exist, develop a strategy to address such deficiencies.

### (7) Bridge Management Requirements

(A) This section shall assess the current schedule for bridge openings, the adequacy of ship-to-bridge communications, and the physical limitations affecting vertical and horizontal clearance.

### (8) Enforcement

(A) This section shall include suggested mechanisms that will ensure that the provisions of the plan are fully, uniformly and regularly enforced.

### (9) Project Funding

## Appendix D

This section shall:

- (A) provide recommendations for funding projects that the committee intends to recommend or initiate; and
  - (B) consider the imposition of user fees, and assess existing billing mechanisms as potential funding sources.
- (10) Competitive Aspects

This section shall:

- (A) identify and discuss the potential economic impacts of implementing the provisions of the harbor safety plan; and
- (B) describe the significant differences in the restrictions that could vary from port to port within the region.

(11) Miscellaneous

(A) This section shall address any additional issues deemed necessary by the harbor safety committee that could impact safe navigation in the region including, but not limited to:

1. vessel pilotage;
2. vessel ballast procedures or requirements;
3. vessel mooring requirements;
4. navigation in reduced or restricted visibility; and
5. maintenance dredging necessary for safe vessel operation.

**NOTE: Authority cited: Sections 8670.23 and 8670.23.1, Government Code.  
Reference: Section 8670.23, Government Code.**

## **Annual Work Group Reports**

### **Ferry Work Group**

Pat Murphy, Chair  
Blue & Gold Fleet  
Pier 41 Marine Terminal  
San Francisco, California 94133  
Phone: (415) 705-8200  
Fax: (415) 705-5429  
patrick@blueandgoldfleet.com

#### Accomplishments 2007/2009

1. Established maneuvering zone radius at San Francisco Ferry building ferry terminals.
2. Agreed on naming conventions for zone, communication waypoints and route to/from outlying destinations.
3. Codified Maneuver Zone protocol into format for vote/publication in the HSC plan.
4. Identified and produced the maneuvering zone routes on nautical charts.

#### Future Goals

1. Develop ferry communications protocol.

## Appendix E

### **Prevention through People Work Group**

Margot Brown, Chair  
3217 Fiji Lane  
Alameda, California 94501  
Phone: (510) 523-2098  
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E-mail: mjbjhb@aol.com

#### Accomplishments 2007/2009

1. Continue distribution of kayak materials.
2. Serve on Water Trail Committee, representing marine safety issues.
3. Publicize America's Waterway Watch program to wide audience.
4. PTP mission in Cosco Busan investigation: Communications. Wrote lengthy analysis of various communications prior to, and succeeding incident in OSPR report to Governor, and made recommendations to OSPR and Coast Guard Sector San Francisco.

#### Future Goals

1. Publish update of "Where the Heck is Collinsville?" brochure.
2. Continue safety updates to non-powered vessels.
3. Produce flyer and brochure regarding hoax "Mayday" calls to Coast Guard, and distribute widely.
4. Continue distribution of DVD "America's Waterway Watch", sponsored by C.G. Commandant Allen.

## **Tug Escort Work Group**

Captain Fred Henning, Chair  
Baydelta Maritime  
Pier 1  
San Francisco, California 94111  
Phone: (415) 653-5800  
Fax: (415) 781-2344  
fred.henning@baydeltamaritime.com

### Accomplishments 2007/2009

The Tug Escort Work Group met several times during the year to discuss the following topics as referred by the full Harbor Safety Committee.

1. Analyzed Cosco Busan allision related to tug operations, studying the question: Would tug escorting be an effective strategy to prevent a similar occurrence? The Work Group concluded that there was no current evidence that would suggest tug escorting would have prevented the Cosco Busan incident or similar incidents from occurring.
  - A tug in front of a vessel is in danger of being overtaken and capsized by the vessel, as the speed of the tug is generally slower than that of the vessel.
  - The tug usually does not have better visibility than the vessel being escorted, for example a 100 foot-long tug tethered to the side of a 900 foot-long vessel.
  - The tug's personnel are focused on safely keeping the tug's position relative to the vessel thus having limited capacity for the additional responsibility of "leading" the vessel being escorted.
2. Developed a Best Maritime Practice, to be included in the Harbor Safety Plan, recommending the use of simulator training for tanker escort tug crews as well as for tugs assisting and docking container ships, bulk carriers and chemical ships.
3. The Work Group reaffirmed the Committee's previous position that the Captain of the Port has sufficient authority to mandate tug escorts for particular ships and that further regulation is not recommended
4. Updated the Escort Plan document used by tankers for the Master/Pilot exchange prior to entering San Francisco Bay.

### Future Goals

Continue to monitor regulations introduced in Sacramento that may affect the Tanker and Tug Escort industry. Provide analysis on issues of concern to the full HSC and act as a source of information providing guidance to the full committee.

## Appendix E

### **Navigation Work Group**

Captain Bruce Horton, Chair  
S.F. Bar Pilots  
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San Francisco, California 94111  
Phone: (510) 326-3722  
b.horton@sfbarpilots.com

#### Accomplishments 2007/2009

Fiscal year 2007-08 was an exceptionally busy time for the HSC and the Navigation Work Group. In November 2007, the Cosco Busan struck the Bay Bridge in reduced visibility causing major damage to the ship, the bridge, and the environment. We were then tasked by the Governor to find out reasons for this happening and what we could do to hopefully stop this from happening again. The following are the issues that the Work Group discussed and acted upon.

1. The Navigation Work Group ratified a document that the USCG and SF Bar Pilots put together regarding vessel movements in SF Bay in reduced visibility, and sent it to the HSC. This document was adopted by the full HSC and is now a part of the Harbor Safety Plan.
2. The Work Group reviewed and confirmed that the existing speed limits and restrictions for SF Bay were adequate and no further changes were needed.
3. The Work Group looked at the existing regulations regarding crew staffing requirements, and found those to be covered by International and National Maritime Laws, not by local HSCs.
4. The Work Group ratified a document pertaining to inclement weather conditions in SF Bay for large vessels, and sent it to the HSC. This document was adopted by the full HSC and is now a part of the Harbor Safety Plan.
5. The Work Group is working with the Tug Escort Group and Ferry Work Group to draw up a document pertaining to inclement weather conditions for vessels (other than large vessels).
6. The Work Group is awaiting a decision on the use of Portable Pilot Units from the State Board of Pilot Commissioners, and will follow up when and if action needs to be taken by the Work Group.

#### Future Goals

1. Develop protocols for closing areas of the Bay to vessel traffic in inclement weather.

## **PORTS Work Group**

Captain Marc Bayer, Chair  
Tesoro Refining and Marketing  
150 Solano Way  
Martinez, California 94553-1487  
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Fax: (925) 372-3082  
MBayer@tsocorp.com

### Accomplishments 2007/2009

1. Obtained funding for the San Francisco PORTS operations and maintenance to be administered by the Marine Exchange through an agreement with OSPR through June 2009.
2. Obtained funding from Tesoro to purchase and install a current and MET sensor on the Avon Wharf.
3. Began installation of additional PORTS sensors throughout the San Francisco Bay to support deep draft vessel navigation and the marine community.
4. Completed re-activation and equipment upgrades to the San Francisco PORTS that were originally in place and added the following new ones.
  - Tesoro Amorco wharf – current sensor
  - UPRR Bridge – anemometer
  - Richmond current and MET sensor re-installed
  - Tesoro Avon Wharf current and MET sensor
5. Present and proposed PORTS configuration:
  - Richmond Southampton Shoal Buoy R6 current meter – operational data available but not on PORTS text page
  - Amorco current meter - operational
  - Avon current meter – operational but data not yet available
  - MET at Amorco installation has been delayed.
  - The site review for the Ferry bldg wind bird will take place at the time of the Amorco MET installation, Feb – March 2009.
  - Awaiting a buoy from USCG for the Oakland Bar Channel priority # 1
  - Awaiting a buoy for the Anchorage #9 current meter priority #2 – possible grant money install
  - MET at Pier 80 – possible grant money install - cancelled, no longer deemed necessary with the installation of pier 27.
  - MET at Pier 27 – possible grant money install
  - MET at Rodeo – possible grant money install

## Appendix E

- MET at Army Pt.- possible grant money install

### Ongoing and Future Goals

1. Complete installation of additional PORTS sensors.
2. Secure permanent funding for San Francisco PORTS.
3. The PORTS work group is looking at other existing sensors in the bay to enhance and enlarge the PORTS system rather than add additional stand alone sensors. At the time of this writing the PORTS working group has begun looking at the availability of salinity data in the bay.
4. The working group's vision for the future is to provide one stop shopping for the mariner by imposing PORTS data and real time tides and currents onto electronic charts through the use of AIS.

**Office of Spill Prevention and Response (OSPR)  
TUG ESCORT VIOLATION DISPOSITION  
SUMMARY REPORT FOR 2007**

VIOLATIONS TOTAL

Failure to Notify the S.F. Marine Exchange	7
Bollard Pull Certificate expired	0
Current Velocity violation	<u>0</u>
	7

DISPOSITION TOTAL

Violation Dismissed	4
Hearing Waived / Case settled	2
Still Pending	<u>1</u>
	7

**Office of Spill Prevention and Response (OSPR)  
TUG ESCORT VIOLATION DISPOSITION  
SUMMARY REPORT FOR 2008**

VIOLATIONS TOTAL

Failure to Notify the S.F. Marine Exchange	4
Bollard Pull Certificate expired	0
Current Velocity violation	0
Not enough required Kips for the Zone	<u>2</u>
	6

DISPOSITION TOTAL

Violation Dismissed	0
Hearing Waived / Case settled	0
Still Pending	<u>6</u>
	6

## San Francisco Region Certified Escort Vessels

Tug	Boat ID	LOA	Propulsion System	Number	Rudders	Flanking Rudders	Kips Zones 1 & 2	Kips Zones 4 & 6	Certification Expires
<b>AmNav Maritime Services</b>									
AVENGER	ANAV	94.8	Conventional, Open	2	2	0	36.49	36.49	01-Jan-2103
DEFIANT	ANDF	97.7	Conventional, Open	2			46.20	46.20	01-Jan-2103
ENTERPRISE	ANEN	110	Conventional, Open	2	2	0	61.46	61.46	01-Jan-2103
INDEPENDENCE	ANIN		Z-Drive	2	0	0	135.14	135.14	09-Apr-10
LIBERTY	ANLB	95.2	Z-Drive	2	0	0	79.47	79.47	01-Jan-2103
PATRICIA ANN	ANPA	78	Z-Drive	2	0	0	139.19	139.19	02-Jan-11
PATRIOT	ANPT	87.9	Conventional, Open	2	2	0	52.56	52.56	01-Jan-2103
REVOLUTION	ANRV	78	Z-Drive	2	0	0	131.73	131.73	01-Jan-2103
<b>Baydelta Maritime</b>									
DELTA BILLIE	Bddb	100	Z-Drive	2	0	0	187.36	187.36	04-Apr-12
DELTA DEANNA	BDDD	105	Z-Drive	2	0	0	188.00	171.00	01-Jan-2103
DELTA LINDA	BDLA	105	Z-Drive	2	0	0	188.00	171.00	01-Jan-2103
<b>Crowley Marine Services</b>									
GOLIAH	CMGA	105	Z-Drive	2	0	0	188.00	171.00	01-Jan-2103
RESOLUTE	CMRL	110	Z-Drive	2	0	0	215.00	197.00	01-Jan-2103
TIOGA	CMTI	85	Z-Drive	2	0	0	133.00	115.00	01-Jan-2103

Friday, April 10, 2009

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**Vessels with an expiration date of January 1, 2100 are participants in the Escort Tug Inspection Program. So long as a vessels standing in the Escort Tug Inspection Program is maintained, its certification will not expire. The Escort Tug Inspection Program.**

## Appendix G

Tug	Boat ID	LOA	Propulsion System	Number	Rudders	Flanking Rudders	Kips Zones 1 & 2	Kips Zones 4 & 6	Certification Expires
<b>Foss Maritime</b>									
AMERICA	FMAA	98	Z-Drive	2	0	0	248.00	225.00	01-Jan-2103
ARTHUR FOSS	FMAR	102	Cycloidal	2	0	0	188.00	153.00	01-Jan-2103
EMMA FOSS	FMEM	101	Conventional, Open	2	2	0	50.67	50.67	10-Jan-11
KEEGAN FOSS	FMKF	110	Conventional, Kort	2	2	4	73.31	73.31	01-Jan-2103
LYNN MARIE	FMLM	98	Z-Drive	2	0	0	210.00	200.00	01-Jan-2103
MARSHALL FOSS	FMMF	92.2	Z-Drive	2	0	0	210.00	200.00	01-Jan-2103
PACIFIC EXPLORER	FMPE	105	Z-Drive	2	0	0	188.00	171.00	01-Jan-2103
POINT FERMIN	FMPF	32	Conventional, Open	2	2	0	44.79	44.79	10-Apr-11
POINT VICENTE	FMPV	105	Conventional, Open	2	3	0	47.05	47.05	01-Jan-2103
RICHARD FOSS	FMRF	104	Conventional, Open	2	2	0	44.83	44.83	01-Jan-2103
<b>Marine Express</b>									
DELTA CAPTAIN	MEDC	83	Conventional, Kort	2	2	0	25.67	25.67	30-May-10
MARIN SUNSHINE	SWSU	80	Conventional, Open	2	2	0	24.76	24.76	11-Jul-09
SOUTHERN CROSS	SWSC	81	Conventional, Kort	1	0	0	23.38	23.38	11-Jul-09
<b>Oscar Niemeth Towing</b>									
AMERICAN EAGLE	ONAE	117	Conventional, Open	2	2	0	53.20	53.20	23-Jun-11
<b>Starlight Marine Services, Inc.</b>									
JOHN QUIGG	STJQ	76	Z-Drive	2	0	0	91.05	91.05	01-Jan-2103
MILLENNIUM DAWN	STMD	105	Z-Drive	2	0	0	181.00	168.00	01-Jan-2103

Friday, April 10, 2009

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## Appendix G

Tug	Boat ID	LOA	Propulsion System	Number	Rudders	Flanking Rudders	Kips Zones 1 & 2	Kips Zones 4 & 6	Certification Expires
MILLENNIUM	STMF	105	Z-Drive	2	0	0	181.00	168.00	01-Jan-2103
TIM QUIGG	STTQ	80	Z-Drive	2	0	0	90.35	90.35	01-Jan-2103
Z-FIVE	STZ5	95	Z-Drive	2	0	0	128.00	132.00	01-Jan-2103
Z-FOUR	STZ4	95	Z-Drive	2	0	0	128.00	132.00	01-Jan-2103
Z-THREE	STZ3	95	Z-Drive	2	0	0	128.00	132.00	01-Jan-2103
<b>Westar Marine Services</b>									
APOLLO	WSAP	87	Conventional, Open	2	2	0	24.83	24.83	14-Jul-09
BEARCAT	WSBC	69	Conventional, Open	2	2	0	18.04	18.04	28-Feb-10
ORION	WSOR	100	Conventional, Open	2	2	0	43.79	43.79	07-Apr-12
SAGITTARIAN	WSSA	79	Conventional, Open	2	2	0	44.16	44.16	30-Nov-10
TAURUS	WSTS	69	Conventional, Kort	2	2	0	25.04	25.04	07-Apr-12

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**Vessels with an expiration date of January 1, 2100 are participants in the Escort Tug Inspection Program. So long as a vessels standing in the Escort Tug Inspection Program is maintained, its certification will not expire. The Escort Tug Inspection Program.**

### San Francisco Bay Clearinghouse Report For 2007

#### San Francisco Bay Region Totals

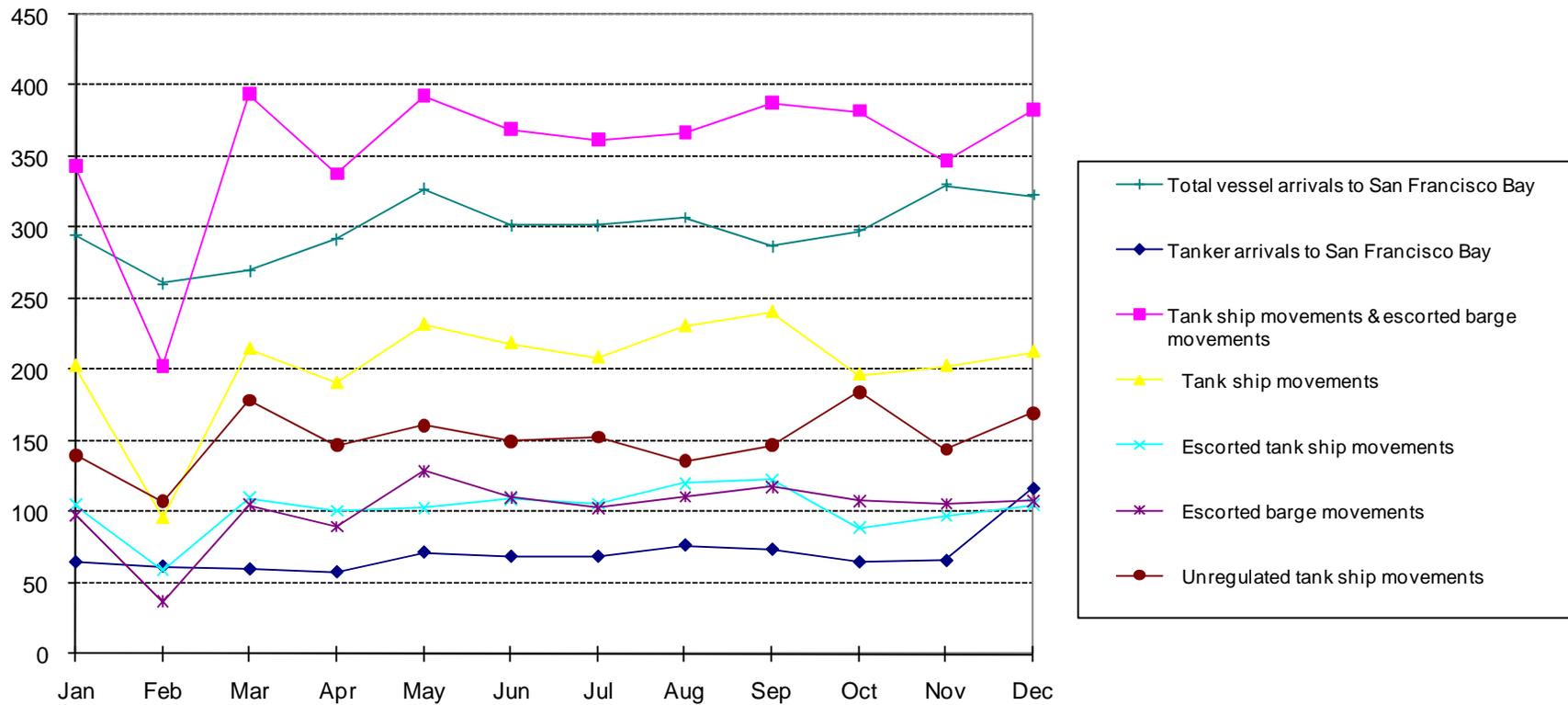
			<u>2006</u>
Tanker arrivals to San Francisco Bay	854		1,043
Tank ship movements & escorted barge movements	4,269		3,917
Tank ship movements	2,450	57.39%	2,373
Escorted tank ship movements	1,227	28.74%	1,234
Unescorted tank ship movements	1,223	28.65%	1,139
Tank barge movements	1,819	42.61%	1,544
Escorted tank barge movements	947	22.18%	813
Unescorted tank barge movements	872	20.43%	731
Percentages above are percent of total tank ship movements & escorted barge movements for each item.			
Escorts reported to OSPR	9		12

<u>Movements by Zone</u>	<u>Zone 1</u>	<u>%</u>	<u>Zone 2</u>	<u>%</u>	<u>Zone 4</u>	<u>%</u>	<u>Zone 6</u>	<u>%</u>	<u>Total</u>	<u>%</u>
Total movements	2,657		4,131		0		2,186		8,974	
Unescorted movements	1,264	47.57%	2,050	49.62%	0	0.00%	1,007	46.07%	4,321	48.15%
Tank ships	830	31.24%	1,258	30.45%	0	0.00%	499	22.83%	2,587	28.83%
Tank barges	434	16.33%	792	19.17%	0	0.00%	508	23.24%	1,734	19.32%
Escorted movements	1,393	52.43%	2,081	50.38%	0	0.00%	1,179	53.93%	4,653	51.85%
Tank ships	810	30.49%	1,179	28.54%	0	0.00%	560	25.62%	2,549	28.40%
Tank barges	583	21.94%	902	21.83%	0	0.00%	619	28.32%	2,104	23.45%

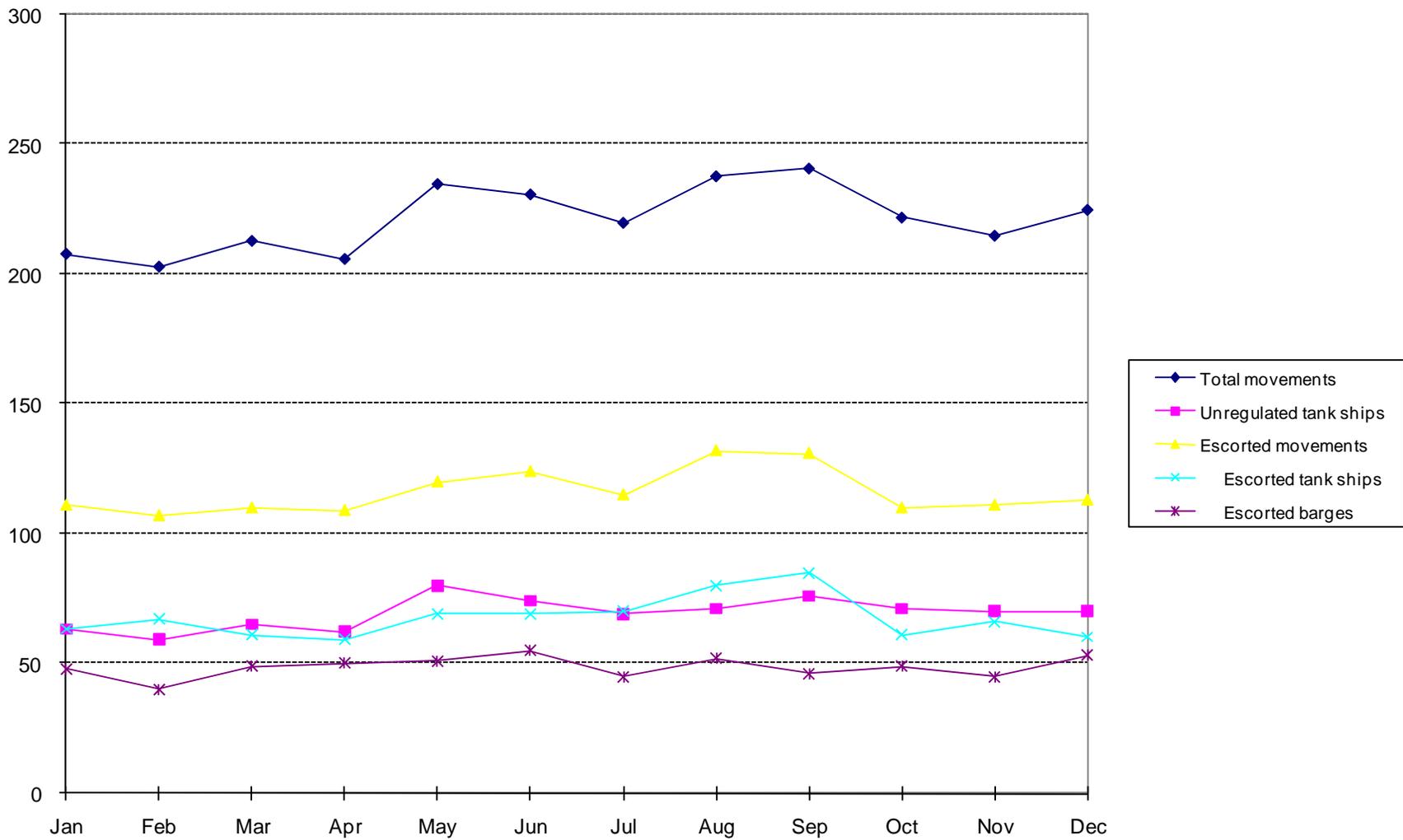
## Notes:

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.

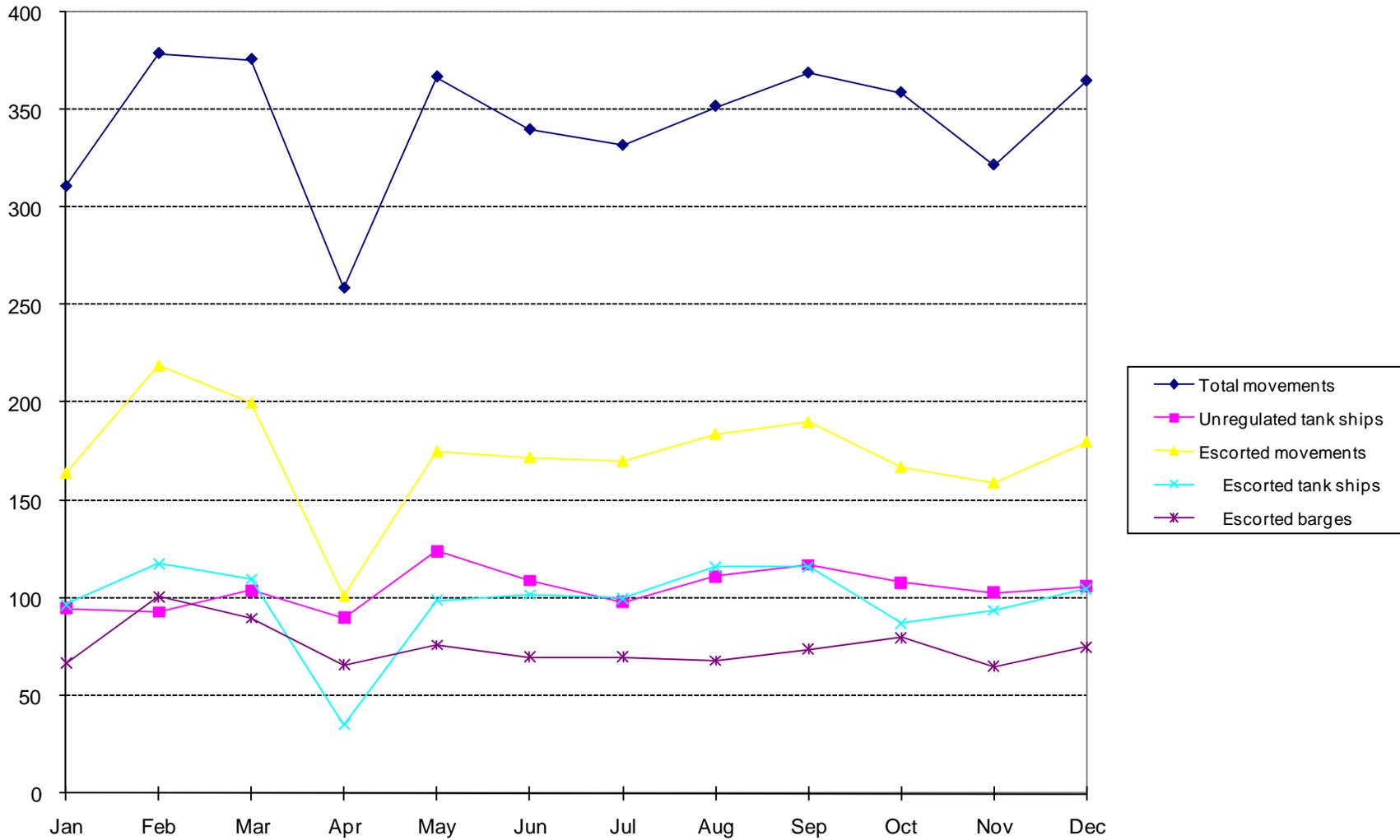
## Total Escort Movements in San Francisco Bay for 2007



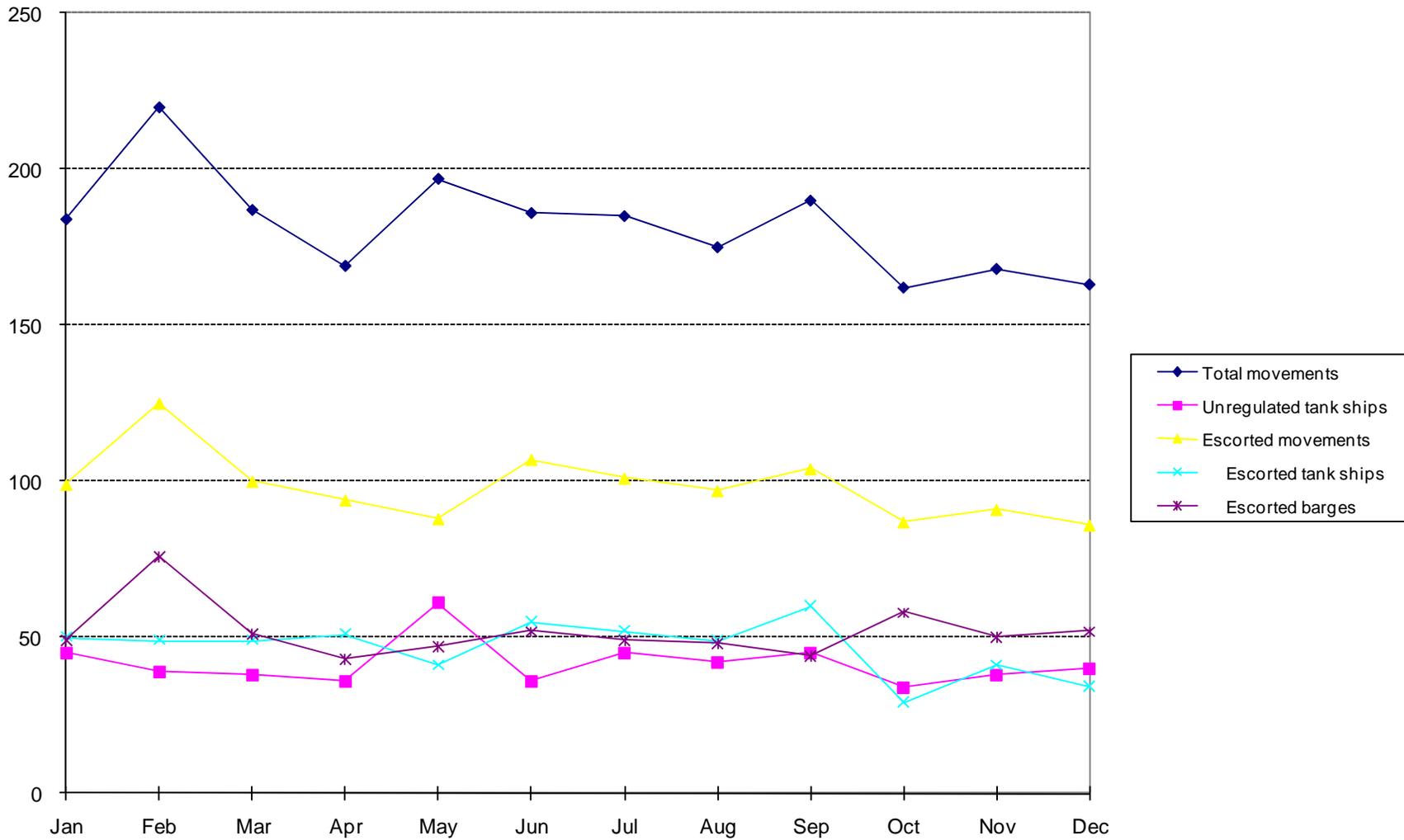
### Zone 1 Totals for 2007



### Zone 2 Totals for 2007



### Zone 6 Totals for 2007



## San Francisco Bay Clearinghouse Report For 2008

### San Francisco Bay Region Totals

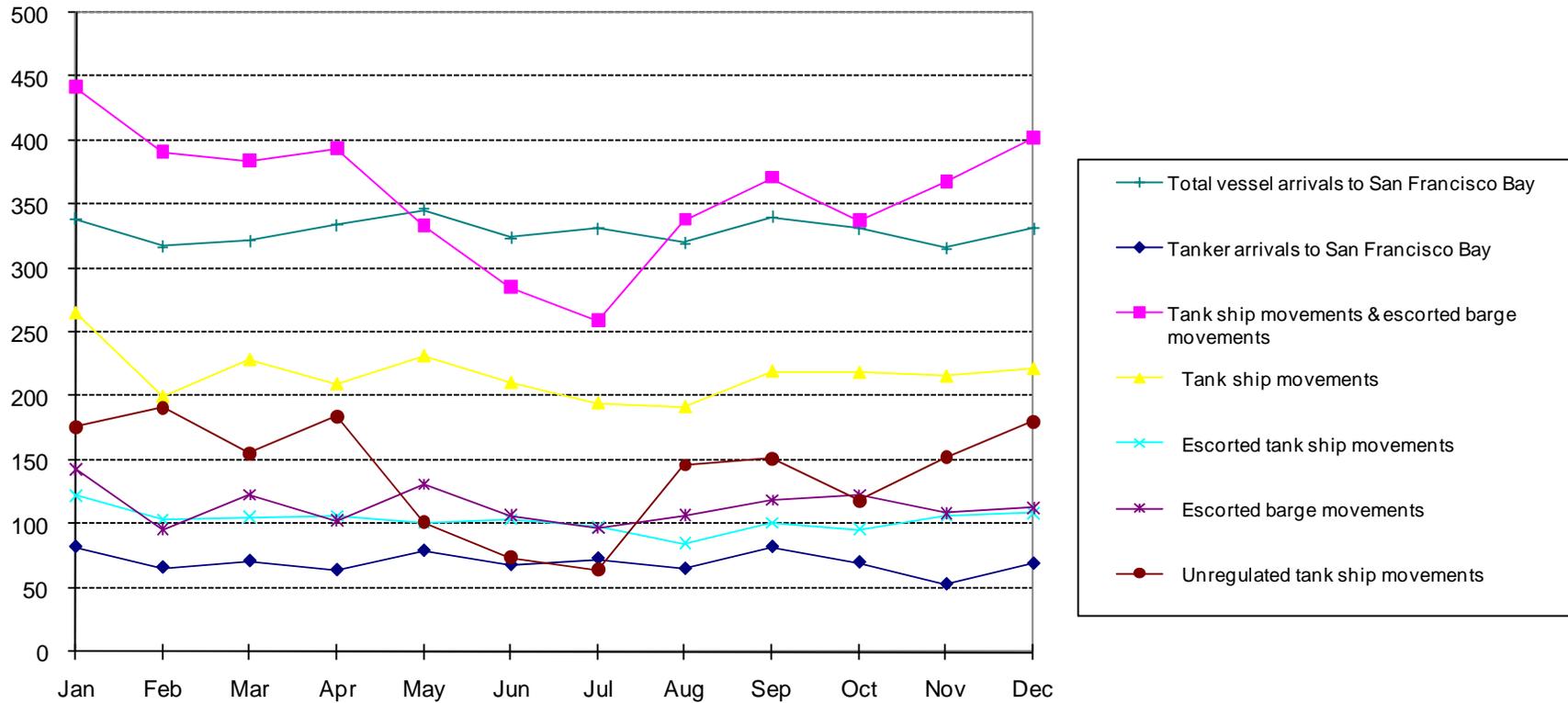
		<u>2007</u>
Tanker arrivals to San Francisco Bay	842	785
Barge arrivals to San Francisco Bay		<i>(before 2008 barge arrivals were not totaled)</i>
Total Tanker and Barge Arrivals	842	
Tank ship movements & escorted barge movements	4,304	3,907
Tank ship movements	2,612	60.69% 2,241
Escorted tank ship movements	1,241	28.83% 1,121
Unescorted tank ship movements	1,371	31.85% 1,120
Tank barge movements	1,692	39.31% 1,666
Escorted tank barge movements	738	17.15% 869
Unescorted tank barge movements	954	22.17% 797
Percentages above are percent of total tank ship movements & escorted barge movements for each item.		
Escorts reported to OSPR	4	9

<u>Movements by Zone</u>	<u>Zone 1</u>	<u>%</u>	<u>Zone 2</u>	<u>%</u>	<u>Zone 4</u>	<u>%</u>	<u>Zone 6</u>	<u>%</u>	<u>Total</u>	<u>%</u>
Total movements	2,498		4,045		0		2,010		8,553	
Unescorted movements	1,279	51.20%	2,179	53.87%	0	0.00%	1,066	53.03%	4,524	52.89%
Tank ships	923	36.95%	1,364	33.72%	0	0.00%	530	26.37%	2,817	32.94%
Tank barges	356	14.25%	815	20.15%	0	0.00%	536	26.67%	1,707	19.96%
Escorted movements	1,219	48.80%	1,866	46.13%	0	0.00%	944	46.97%	4,029	47.11%
Tank ships	805	32.23%	1,197	29.59%	0	0.00%	517	25.72%	2,519	29.45%
Tank barges	414	16.57%	669	16.54%	0	0.00%	427	21.24%	1,510	17.65%

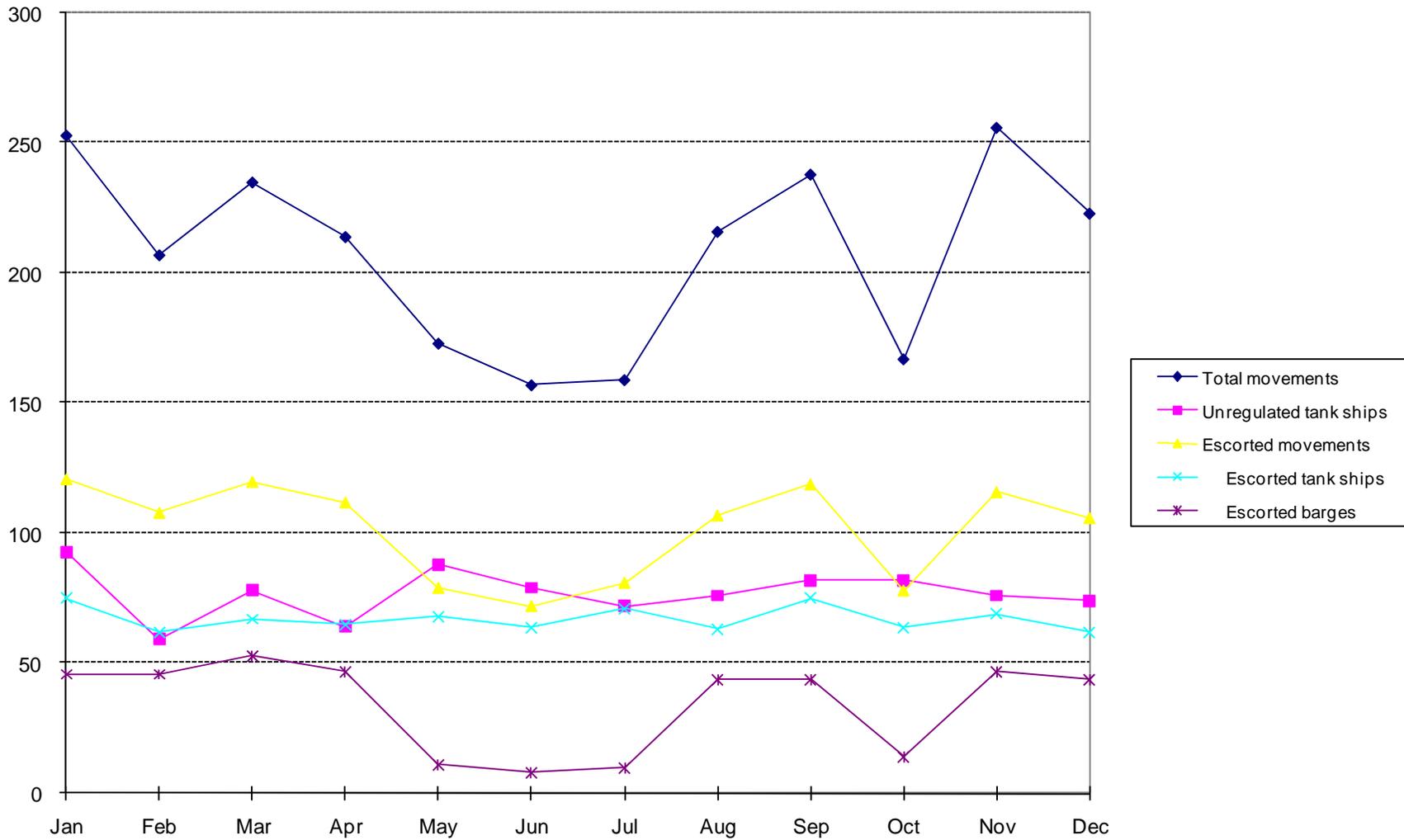
## Notes:

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.

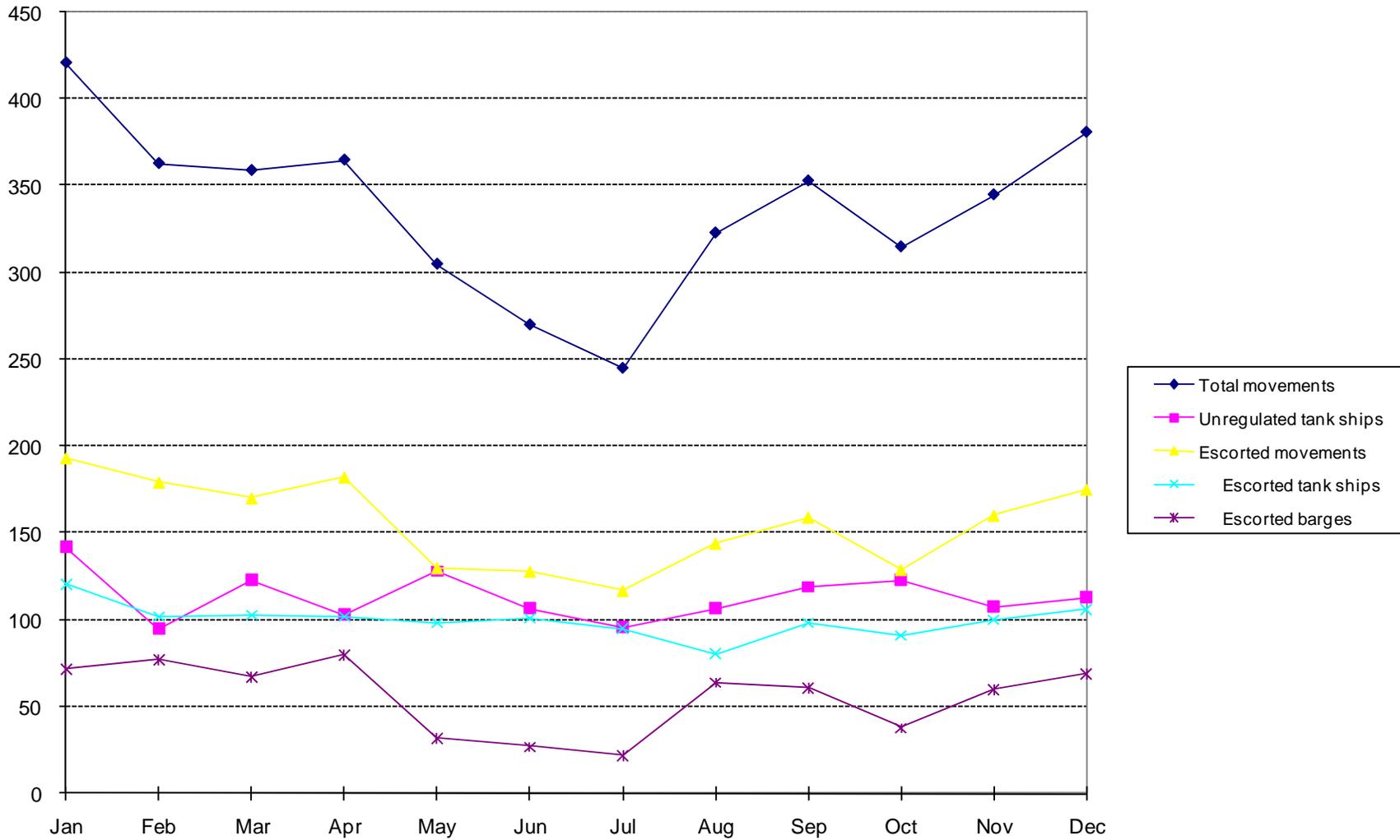
## Total Escort Movements in San Francisco Bay for 2008



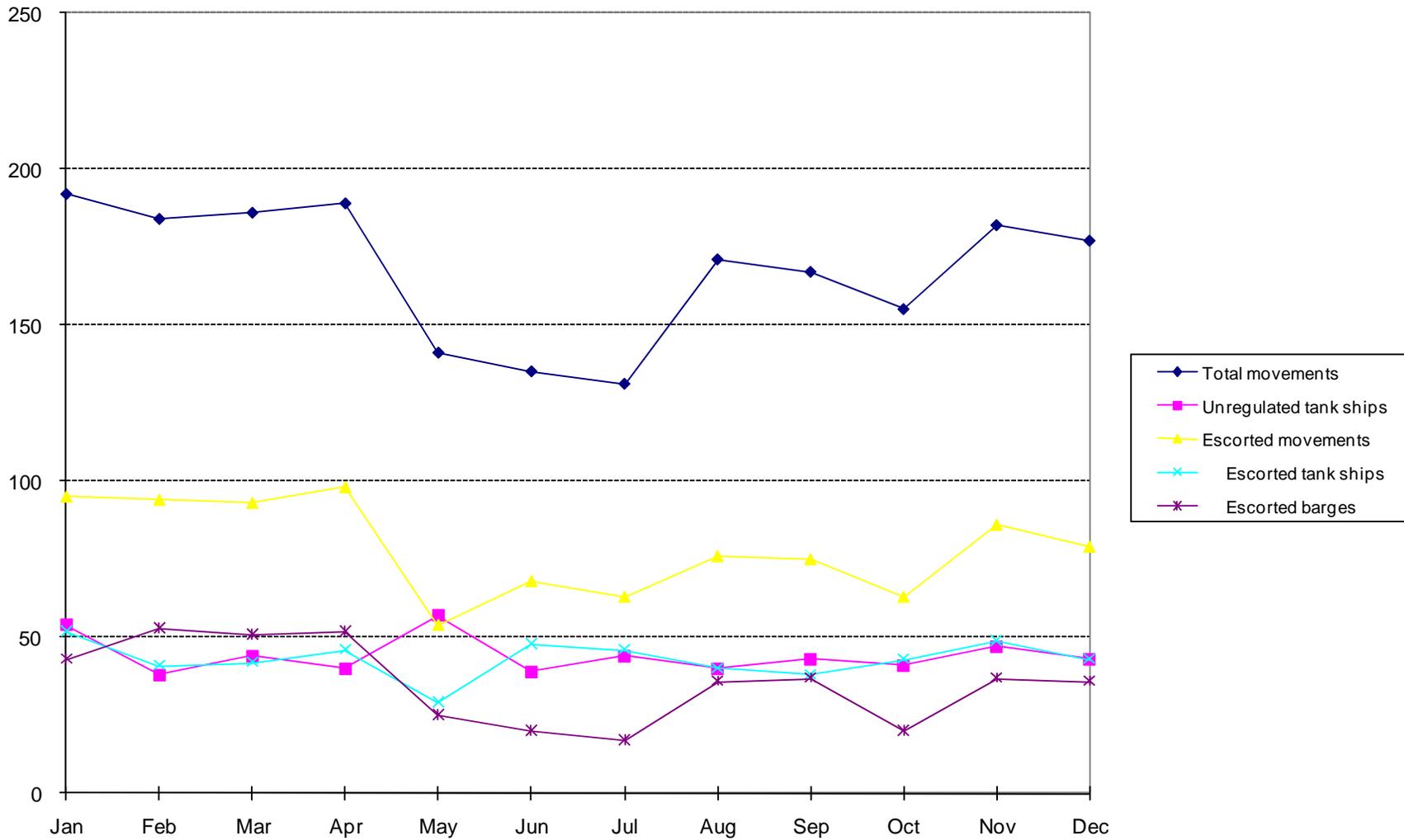
### Zone 1 Totals for 2008



### Zone 2 Totals for 2008



### Zone 6 Totals for 2008






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**Harbor Safety Committee of the  
 San Francisco Bay Region Clearing House**  
 c/o Marine Exchange of the San Francisco Bay Region  
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 San Francisco, California 94123-1308  
 415-441-7988 fax 415-441-1025 [hsc@sfmtx.org](mailto:hsc@sfmtx.org)

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### Comparative Vessel Movement Totals

	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Total vessel arrivals	3,314	3,657	3,594	3,951
Total vessel interbay shifts	1,420	1,632	1,667	2,605
Total tanker arrivals	787	868	854	1,354
Total tanker interbay shifts	795	1,005	907	1,488

*(2007 & 2008 figures include tank barges of escortable size)*

## 2007 Tank Vessel Arrivals

Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
AGIASMA	LBR	TPD	29,998	170	1
ALAM CEPAT	SGP	TPD	35,000	171	1
ALASKAN EXPLORER	USA	TCR	185,000	287	7
ALASKAN FRONTIER	USA	TCR	193,050	287	5
ALASKAN LEGEND	USA	TCR	193,048	290	8
ALASKAN NAVIGATOR	USA	TCR	193,048	290	5
ALIAKMON	LBR	TPD	61,284	213	1
ANDES	GRC	TPD	68,467	228	4
ANGELICA	MHL	TCR	124,992	274	1
ANGELICA SCHULTE	LBR	TCR	106,433	243	2
ANTARCTIC	GRC	TCR	163,216	274	1
ANTARES	COK	TCH	29,954	163	1
ANTIPOLIS	GRC	TPD	74,543	229	2
ARCTIC BREEZE	MLT	TCO	50,885	183	2
ARIADNE JACOB	CYM	TCR	74,875	228	1
ASOPOS	LBR	TPD	63,381	229	4
ASPHALT STAR	GRC	TAS	46,432	183	1
ASSOS	LBR	TPD	47,872	183	1
ASTRO CASSIOPEIA	GRC	TCR	158,553	274	1
ATHENS STAR	LBR	TCR	74,500	229	2
AZOV SEA	LBR	TCO	47,400	183	1
AZTEC	PAN	TCR	68,439	228	3
BAIZO (TCO)	PAN	TCO	47,094	183	1
BALTIC SOUL	MLT	TCO	37,244	183	1
BEECH GALAXY	HKG	TCO	19,998	146	2
BLACK POINT	ITA	TPD	46,825	184	1
BLUE DOLPHIN	ITA	TPD	72,344	229	1
BOW PRIMA	SGP	TCO	45,655	176	1
BRITISH BEECH	IOM	TCR	106,138	241	1
BRITISH EXCELLENCE	IOM	TCO	37,274	182	1
BRITISH INTEGRITY	IOM	TCO	46,803	183	1
BRITISH LAUREL	IOM	TCR	106,500	240	1

## Appendix I

Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
BRO CHARLOTTE	FRA	TCO	44,970	180	1
BRO PREMIUM	SWE	TCO	44,999	183	2
BRUSSELS	BEL	LPG	26,943	169	2
BUM CHIN	HKG	TCO	19,991	146	1
BUM EUN	HKG	TCH	19,500	145	4
BUM SHIN	KOR	TCH	19,997	147	4
BUM YOUNG	KOR	TCH	19,200	149	4
CABO HELLAS	MHL	TPD	69,636	228	2
CABO PILAR	PAN	TPD	69,250	228	2
CABO SOUNION	MHL	TCR	69,636	228	1
CALM SEA	LBR	TPD	98,929	243	2
CAP GUILLAUME	GRC	TCR	158,889	274	1
CAP JEAN	GRC	TCR	146,439	274	1
CAP LARA	GRC	TCR	157,700	274	2
CAPE ASPRO	CYP	TCO	105,405	244	2
CAPE AVILA	CYP	TCR	105,237	244	4
CAPE BATA	MHL	TCR	159,997	274	1
CAPE BILLE	MHL	TCO	35,089	176	1
CAPTAIN H.A.DOWNING	USA	TCO	39,385	207	9
CARL JACOB	CYM	TPD	74,908	228	1
CARLI BAY	BEL	LPG	20,613	155	1
CEDAR GALAXY	PAN	TCH	19,983	144	1
CHALEUR BAY	CYM	TPD	71,345	229	2
CHALLENGE PACIFIC	SGP	TPD	47,286	183	1
CHALLENGE PRELUDE	SGP	TPD	48,555	180	1
CHAMPION (TCO)	NOR	TCO	36,955	182	1
CHAMPION ADRIATIC	LBR	TPD	33,187	171	3
CHAMPION LION	LBR	TCO	44,267	171	1
CHAMPION PACIFIC	NIS	TPD	33,886	183	1
CHANG CHI	CHN	TPD	40,015	188	1
CHEMBULK BARCELONA	PHL	TCH	32,345	174	2
CHERRY GALAXY	PAN	TCO	19,364	147	2
CHIMBORAZO	ECU	TCR	66,138	228	3
CIELO DI GUANGZHOU	LBR	TPD	38,877	174	1
CLASSY VICTORIA	PAN	TPD	74,993	228	1

## Appendix I

Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
CLIPPER KRISTIN	BHS	TCO	11,316	117	1
COLORADO VOYAGER	USA	TPD	39,842	198	42
COTOPAXI	ECU	TCR	66,100	228	3
COURCHEVILLE	BEL	LPG	29,171	165	1
CYGNUS VOYAGER	BHS	TCR	156,836	274	22
DA MING HU	CHN	TCR	159,000	275	1
DA QING 452	CHN	TPD	45,823	193	1
DAKOTA	MHL	TCR	159,345	274	1
DANUBIA	LBR	TPD	68,600	228	1
DESH GAURAV	IND	TCR	10,500	244	2
DESH RAKSHAK	IND	TCR	113,918	244	1
DILIGENCE	USA	TPD	39,959	199	1
DUKHAN	QAT	TCO	29,997	176	2
ELM GALAXY	PAN	TCH	19,305	148	1
ENERGY CENTURY	IOM	TCR	70,201	228	1
ENERGY CHAMPION	IOM	TPD	70,753	228	1
ENERGY CHANCELLOR	IOM	TPD	70,558	228	2
ENERGY COMMANDER	IOM	TCR	70,681	228	1
ENERGY CONQUEROR	IOM	TCR	70,616	228	2
ENERGY PIONEER	IOM	TPD	51,244	183	3
ERIKOUSSA	GRC	TPD	70,142	228	1
EURONIKE	GRC	TCR	164,565	274	1
EVROTAS	LBR	TPD	61,281	214	2
EW HARTING	LBR	TPD	29,999	170	1
FAIRCHEM COLT	PAN	TCH	19,998	146	2
FAIRCHEM GENESIS	PAN	TCO	14,281	134	1
FAIRCHEM STALLION	PAN	TCH	19,992	146	1
FANTASY I	PAN	TCH	22,729	158	1
FELICITY (TPD)	LBR	TPD	71,029	228	1
FICUS	LBR	TCO	32,229	171	1
FINESSE	GRC	TCR	150,709	274	1
FORMOSA EIGHT	LBR	TCH	35,621	175	1
FORMOSA ELEVEN	LBR	TCH	33,200	175	2
FORMOSA SEVEN	LBR	TCH	35,657	167	1
FORMOSA SIX	LBR	TCH	35,622	167	1

## Appendix I

Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
FORMOSA TEN	LBR	TCH	36,233	175	1
FOUR SCHOONER	CYM	TPD	72,500	219	4
FR8 PRIDE	SGP	TCR	74,035	229	4
FR8 VENTURE	MHL	TCR	69,999	229	1
FREJA BREEZE	PAN	TPD	47,172	182	1
FREJA DANIA	LBR	TPD	53,000	186	1
FUJI SPIRIT	BHS	TCR	106,360	241	2
FUJIGAWA	PAN	TCO	17,845	149	3
GALAHAD (TCH)	BRB	TCH	44,996	183	1
GAVROS	LBR	TCO	45,222	194	1
GENMAR HOPE	MHL	TCR	159,539	274	1
GINGA EAGLE	PAN	TCO	19,999	154	6
GINGA FALCON	PAN	TCO	19,998	153	5
GINGA HAWK	PAN	TCO	19,998	148	1
GINGA KITE	PAN	TCO	18,700	148	1
GINGA MERLIN	PAN	TCH	19,999	147	7
GOLDEN ELIZABETH	PAN	TCH	15,500	138	1
GRACE VICTORIA	PAN	TPD	75,000	228	1
GREEN PARK	GBR	TCH	19,500	145	1
GULF COAST	BHS	TCR	74,999	228	1
GULF ELAN	BHS	TCO	46,894	183	1
GULF GRACE	BHS	TCH	65,017	219	2
GULF PEARL	BHS	TCO	74,999	228	1
GULF STREAM	BHS	TPD	74,999	228	2
HALEAKALA	USA	OBA	4,658	107	1
HAMANE SPIRIT	BHS	TCR	105,203	236	1
HELLESPONT PRIDE	MHL	TPD	73,727	229	1
HELLESPONT TATINA	MHL	TCR	105,535	239	3
HELLESPONT TRINITY	MHL	TCR	120,000	274	1
HELLESPONT TRIUMPH	LBR	TCR	157,046	274	7
HERMITAGE BRIDGE	LBR	TCH	47,880	183	1
HIGH CHALLENGE	LBR	TCH	46,473	183	1
HIGH GLORY	PAN	TPD	45,728	180	2
HIGH HARMONY	PAN	TPD	45,913	180	1
HMI BRENTON REEF	USA	TCO	45,671	183	2

## Appendix I

Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
HONOURABLE HENRY JACKSON	BHS	TCR	75,598	245	1
HOUSTON	USA	TNA	33,095	179	2
IBLEA	LBR	TCR	10,584	240	2
ICE ENERGY	LBR	TCR	70,377	229	1
IKAROS	BHS	TPD	72,000	229	1
INCA	GRC	TPD	68,467	228	5
IONIAN TRADER	NIS	TPD	40,632	178	1
JAG LALIT	IND	TCR	158,344	274	1
JAG LAYAK	IND	TCR	147,834	274	1
JAG LOK	IND	TCR	158,280	274	1
JI LI HU	CHN	TPD	66,094	228	1
JILL JACOB	CYM	TCR	72,909	228	2
JOHANN JACOB	CYM	TPD	73,072	228	1
KAMOGAWA	PAN	TCO	17,712	149	1
KIHULAND	MLT	TCH	22,717	161	1
KINUGAWA	PAN	TCO	24,743	160	1
KISOGAWA	PAN	TCH	17,739	140	2
KODIAK	USA	TCR	124,822	252	3
KWK ESTEEM	SGP	TCR	105,342	256	1
KYRIAKOULA	GRC	TCR	72,000	228	3
LAKATAMIA	BHS	TPD	48,684	183	1
LAPTEV SEA	LBR	TCO	47,314	175	1
LEONIS	ITA	TCR	94,225	233	1
LIAN AN HU	CHN	TCR	71,962	229	1
LMZ ARTEMIS	CYP	TCO	69,714	228	1
LMZ NAFSIKA	CYP	TPD	69,431	228	1
LMZ NEFELI	GRC	TCR	69,510	229	1
LODESTAR GRACE	PAN	TCH	14,298	134	1
LOS ROQUES	CYM	TPD	61,130	228	3
LYRA PIONEER	PAN	TCR	45,985	180	1
MAERSK BERING	SGP	TCO	29,058	176	19
MAERSK JEWEL	SGP	LPG	29,190	180	5
MAGPIE	LBR	TCO	35,966	175	1
MAPLE GALAXY	PAN	TCO	19,386	148	2
MARITIME JINGAN	HKG	TCH	44,800	180	1

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Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
MARITIME MAISIE	HKG	TCH	44,404	180	1
MARITIME TUNTIGA	MYS	TCO	44,508	180	1
MATSUKAZE	PAN	TCO	17,676	150	3
MAYA	GRC	TCR	68,500	228	2
MERLIN TRADER	LBR	TPD	37,613	171	2
MISSISSIPPI VOYAGER	USA	TPD	46,094	183	15
MOUNT ROBSON	CYP	TCH	39,819	173	1
NAVIGA	LBR	TCR	150,841	274	1
NEAPOLIS	GRC	TPD	74,543	229	3
NECHES	MHL	TCH	44,996	182	2
NEDAS	LBR	TPD	61,000	213	1
NEPTUNE VOYAGER	BHS	TCR	104,875	243	2
NEW AMITY	LBR	TCR	106,120	241	2
NOEMI	MHL	TCR	64,999	228	5
NORD OPTIMISER	LBR	TPD	47,371	183	1
NORD STREAM	PAN	TCO	45,974	179	1
NORDIC FIGHTER	NOR	TCR	153,181	269	2
NORDIC VOYAGER	NIS	TCR	149,591	271	1
NORDSCOT	LBR	TCH	29,999	183	2
NS POWER	LBR	TCO	40,042	176	1
OAK GALAXY	PAN	TCH	19,990	148	1
OLYMPIC FLAIR	GRC	TCR	149,817	274	1
OLYMPIC FUTURE	GRC	TCR	155,039	274	1
OMEGA LADY MIRIAM	MHL	TCR	71,522	228	2
OPAL EXPRESS	MHL	TCR	48,635	180	1
ORIENTAL RUBY	PAN	TTA	44,996	189	2
ORION VOYAGER	BHS	TCR	156,447	275	21
OVERSEAS AQUAMAR	MHL	TPD	47,236	182	3
OVERSEAS GOLDMAR	MHL	TPD	69,684	228	1
OVERSEAS HERCULES	HKG	TCO	51,233	183	2
OVERSEAS HOUSTON	USA	TPD	46,815	183	2
OVERSEAS JADEMAR	MHL	TCR	69,697	228	2
OVERSEAS LONG BEACH	USA	TPD	46,812	183	6
OVERSEAS ORION	HKG	TCO	51,218	183	1
OVERSEAS PEARLMAR	MHL	TCR	69,250	219	5

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Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
OVERSEAS PETROMAR	MHL	TCO	38,768	183	1
OVERSEAS PHILADELPHIA	USA	TPD	43,648	201	1
OVERSEAS PUGET SOUND	USA	TPD	50,860	200	14
OVERSEAS REGINAMAR	MHL	TPD	70,312	228	4
OVERSEAS REYMAR	MHL	TPD	69,636	219	3
OVERSEAS ROSEMAR	MHL	TCR	70,000	228	7
OVERSEAS RUBYMAR	MHL	TCR	69,334	228	1
OVERSEAS SILVERMAR	MHL	TPD	69,609	228	5
OVERSEAS VISAYAS	MHL	TPD	74,933	228	1
PACIFIC ALLIANCE	PAN	TCR	105,941	244	1
PACIFIC HONOR	PAN	TTA	45,719	179	2
PACIFIC OASIS	PAN	TPD	47,999	180	2
PACIFIC OPAL	SGP	TPD	44,999	183	1
PACIFIC PARTNER	PAN	TCR	105,946	244	1
PACIFIC RUBY	SGP	TPD	46,851	183	1
PACIFIC SERENITY	PAN	TPD	47,999	180	1
PACIFIC SUNSHINE	PAN	TCR	45,994	180	1
PAPILLON	BHS	TCO	47,302	183	2
PETERSBURG	USA	TCR	50,705	224	2
PETRO VENUS	PAN	TPD	45,887	180	1
POLAR ADVENTURE	USA	TCR	141,740	272	12
POLAR CALIFORNIA	USA	TCR	127,003	290	6
POLAR DISCOVERY	USA	TCR	141,740	272	6
POLAR ENDEAVOUR	USA	TCR	141,740	273	6
POLAR ENTERPRISE	USA	TCR	141,740	273	10
POLAR RESOLUTION	USA	TCR	140,320	273	9
POLYAIGOS	GRC	TCR	69,510	228	1
PORT STANLEY	MHL	TCO	46,157	183	1
POUL SPIRIT	LBR	TCR	105,351	245	2
PRINCE WILLIAM SOUND	USA	TCR	122,941	268	2
RUBY	MLT	TPD	47,278	183	1
S/R BAYTOWN	USA	TCR	59,625	238	2
S/R LONG BEACH	USA	TCR	214,853	300	7
SAKURA	PAN	TCO	22,553	156	1
SALVIA EXPRESS	PAN	TPD	45,811	180	2

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Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
SANKO BREEZE	PAN	TCO	105,721	239	4
SANKO CONFIDENCE	LBR	TCR	71,024	228	1
SANKO DYNASTY	MHL	TCR	99,998	243	2
SANKO QUALITY	LBR	TCR	95,628	246	4
SCF TOBOLSK	LBR	LPG	26,800	174	4
SCF URAL	LBR	TCR	159,314	274	1
SEABULK AMERICA	USA	TCH	4,312	181	5
SEABULK AMERICA	USA	TCH	47,053	181	1
SEABULK ARCTIC	USA	TPD	46,094	183	5
SEABULK CHALLENGE	USA	TCO	45,350	191	3
SEABULK ENERGY	USA	TCO	45,671	182	2
SEABULK MARINER	USA	TPD	46,094	183	2
SEABULK PRIDE	USA	TPD	46,069	183	3
SEAMERCURY	PHL	TPD	45,800	180	1
SEAMUSIC	BHS	TPD	47,147	183	1
SEATREASURE	MLT	TPD	37,623	175	1
SEINE	MHL	TCO	35,407	185	1
SENATORE	MHL	TPD	72,514	228	1
SHARON SEA	MHL	TPD	73,870	229	1
SHENG CHI	CHN	TPD	40,015	188	1
SIERRA	USA	TCR	124,777	264	6
SIRIUS VOYAGER	BHS	TCR	156,382	276	33
SITEAM ANATAS	MHL	TCO	40,158	176	3
SONANGOL GIRASSOL	BHS	TCR	149,994	274	1
SONANGOL KASSANJE	BHS	TCR	158,706	274	1
SONANGOL KIZOMBA	BHS	TCR	159,165	274	1
SONANGOL NAMIBE	BHS	TCR	149,992	274	1
SOUTH SEA	LBR	TCR	149,393	274	1
SPIRIT EXPRESS	PAN	TPD	45,861	179	1
SPRING LYRA	PAN	TCH	16,020	138	4
SPRING VIRGO	PAN	TCH	15,247	139	1
ST.JOHANNIS	HKG	TCO	51,271	183	1
ST.MARIEN	HKG	TCO	51,218	183	1
ST.PETRI	LBR	TPD	47,228	182	1
STAVANGER BLOSSOM	PAN	TCR	105,641	239	2

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Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
STENA COMPASSION	BMU	TCR	72,782	229	1
STENA COMPATRIOT	BMU	TCR	72,736	229	2
STENA CONCEPT	BMU	TPD	47,171	183	1
STOLT HERON	LBR	TCH	36,613	177	1
STROFADES	GRC	TPD	69,431	228	1
STX ACE 6	PAN	TCO	46,176	183	1
SUNLIGHT VENTURE	MHL	TCR	70,427	229	2
SYLVIE	HKG	LPG	26,500	174	2
TAMAR	MHL	TCH	70,362	228	2
TANJA JACOB	CYM	TCR	62,960	228	2
TEAM NEPTUN	NIS	TCO	48,330	182	1
TENG CHI	CHN	TPD	42,000	188	2
THERA	GRC	TCR	150,678	274	1
TONEGAWA	PAN	TCH	17,722	149	3
TORBEN SPIRIT	BHS	TCR	98,622	245	2
TORM CECILIE	DIS	TCO	44,999	182	1
TORM FREYA	DIS	TCH	46,342	183	1
TORM SARA	SGP	TCR	72,718	228	1
TROGIR	MLT	TCO	39,999	181	1
VEGA VOYAGER	BHS	TCR	104,864	243	1
VELOPOULA	GRC	TPD	66,895	228	2
VERA CRUZ A	PAN	TPD	53,524	177	1
VINASHIN VICTORY	VNM	TCR	34,997	182	1
VOIDOMATIS	LBR	TPD	61,000	213	6
WASHINGTON VOYAGER	USA	TPD	39,796	198	28
XANTHOS	LBR	TPD	61,000	213	3
YAYOI EXPRESS	PAN	TCR	47,999	180	1

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## 2008 Tank Vessel Arrivals

Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
550-1	USA	OTB	20,000	151	8
550-2	USA	OTB	14,999	152	10
550-4	USA	OTB	20,000	156	6
650-2	USA	OTB	27,455	152	18
ABRAM SCHULTE	LBR	TCR	72,664	228	1
ABUL KALAM AZAD	IND	TCR	92,687	237	1
AFFINITY	SGP	TCR	74,100	228	5
AFRODITE	BHS	TPD	53,081	186	1
AJAX	BHS	TCO	53,095	186	2
ALAM BUDI	MYS	TTA	44,999	182	1
ALASKAN EXPLORER	USA	TCR	185,000	287	10
ALASKAN FRONTIER	USA	TCR	193,050	287	7
ALASKAN LEGEND	USA	TCR	193,048	290	9
ALASKAN NAVIGATOR	USA	TCR	193,048	290	4
ALIAKMON	GRC	TCH	46,792	183	2
ALPHA EXPRESS	PAN	TPD	45,858	179	1
ALSEA BAY	USA	OTB	9,075	115	16
ALTIUS	MHL	TPD	73,400	229	1
ANDES	GRC	TPD	68,467	228	4
ANGELICA SCHULTE	LBR	TCR	106,433	243	3
ANTARES	USA	OTB	11,500	103	12
ANTEA	ITA	TCH	40,094	175	1
ANTIPOLIS	GRC	TPD	74,543	229	4
APOSTOLOS	LBR	TCO	47,782	183	2
ARCHANGELOS GABRIEL	GRC	TPD	72,292	229	4
ARIADNE JACOB	CYM	TCR	74,875	228	3
ARTEMIS	BHS	TPD	53,039	186	1
ASPROPYRGOS	BHS	TCR	72,854	229	1
ATHENS STAR	LBR	TCR	74,500	229	3
ATLANTIC CROWN	HKG	TCO	47,128	183	2
ATLANTIC HOPE	HKG	TPD	47,128	183	2
AZTEC	PAN	TCR	68,439	228	4

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Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
BALTIC ADVANCE	CYP	TCO	37,330	183	1
BLUE DOLPHIN	ITA	TPD	72,344	229	1
BM MIMOSA	PAN	TCR	105,576	238	1
BOW PROSPER	SGP	TCH	45,655	177	1
BOW RIO	HKG	TCH	19,999	148	1
BOW SKY	NIS	TCO	40,005	183	1
BRIGHT PACIFIC	PAN	TPD	48,694	180	2
BRITISH HAZEL	IOM	TCR	105,000	240	1
BRO ALBERT	GBR	TCO	45,999	183	1
BRUGGE VENTURE	HKG	LPG	26,777	169	2
BUM EUN	HKG	TCH	19,500	145	4
BUM SHIN	KOR	TCH	19,997	147	4
BUM YOUNG	KOR	TCH	19,200	149	4
BW LENA	PAN	TPD	76,578	229	1
CABO HELLAS	MHL	TPD	69,636	228	3
CABO PILAR	PAN	TPD	69,250	228	1
CABO SOUNION	MHL	TCR	69,636	228	4
CABO VIRGENES	CHL	TPD	69,000	228	1
CALIFORNIA VOYAGER	USA	TCO	45,671	183	2
CAP GEORGES	GRC	TCR	147,443	275	1
CAP THANOS	MHL	TCH	35,650	174	1
CAPE ASPRO	CYP	TCO	105,405	244	1
CAPE AVILA	CYP	TCR	105,237	244	2
CAPE BEALE	MHL	TCO	40,327	176	1
CAPE BILLE	MHL	TCO	35,089	176	1
CAPE BRASILIA	MHL	TCO	40,327	176	2
CAPELLA	USA	OTB	11,434	101	11
CAPRICORN VOYAGER	BHS	TCR	104,611	244	1
CAPTAIN H.A.DOWNING	USA	TCO	39,385	207	7
CARIAD	BRB	TCO	44,999	182	1
CARLI BAY	BEL	LPG	20,613	155	1
CASCADES	USA	OTB	9,974	100	20
CEDAR GALAXY	PAN	TCH	19,983	144	2
CHACONIA	BEL	LPG	29,271	165	1
CHAMPION ADRIATIC	LBR	TPD	33,187	171	2

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Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
CHAMPION PACIFIC	NIS	TPD	33,886	183	3
CHANCE	GRC	TPD	47,106	183	3
CHANG HANG TAN SUO	CHN	TPD	45,719	193	1
CHEMBULK LINDY ALICE	PAN	TCH	33,674	170	1
CHEMBULK MINNEAPOLIS	PAN	TCO	33,682	170	1
CHEMBULK NEW ORLEANS	SGP	TCO	32,363	174	2
CHEMBULK VIRGIN GORDA	SGP	TCO	34,614	170	3
CHEMBULK WESTPORT	PAN	TCH	32,044	170	2
CHEMSTAR SEVEN	PAN	TCH	19,870	144	1
CHEMTRANS STAR	LBR	TCR	63,331	228	3
CHERRY GALAXY	PAN	TCO	19,364	147	2
CHIMBORAZO	ECU	TCR	66,138	228	3
CIELO DI GUANGZHOU	LBR	TPD	38,877	174	4
CIELO DI PARIGI	LBR	TCO	36,032	183	2
CLIPPER TROJAN	BHS	TCO	15,313	139	1
COLORADO VOYAGER	USA	TPD	39,842	198	30
COLUMBIA	USA	OTB	9,345	98	7
COMMENCEMENT BAY	USA	OTB	15,242	114	9
CONCORD I	PAN	TCH	38,960	175	1
COTOPAXI	ECU	TCR	66,100	228	2
COURCHEVILLE	BEL	LPG	29,171	165	2
CYGNUS VOYAGER	BHS	TCR	156,836	274	34
DA CHI	CHN	TPD	42,047	188	2
DAEDALOS	BHS	TPD	72,825	229	1
DBL 77	USA	OTB	11,000	103	5
DENEB	USA	OTB	11,931	103	3
DESH RAKSHAK	IND	TCR	113,918	244	1
DL COSMOS	KOR	TPD	50,100	183	3
DOTTIE	USA	OTB	0	87	2
DRAKES BAY	USA	OTB	12,000	116	5
EAST SIBERIAN SEA	LBR	TCO	47,385	183	1
ELAND	PHL	TPD	47,147	183	1
ELM GALAXY	PAN	TCH	19,305	148	2
EMMANUEL TOMASOS	BHS	TCH	37,113	183	1
ENERGY CHALLENGER	IOM	TCR	70,675	228	2

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Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
ENERGY CHAMPION	IOM	TPD	70,753	228	4
ENERGY CHANCELLOR	IOM	TPD	70,558	228	2
ENERGY COMMANDER	IOM	TCR	70,681	228	3
ENERGY CONQUEROR	IOM	TCR	70,616	228	3
ESHIPS DUGON	MHL	TCO	13,146	127	1
EVEREST SPIRIT	BHS	TCR	115,047	250	8
EVROTAS	LBR	TPD	61,281	214	1
FAIRCHEM COLT	PAN	TCH	19,998	146	1
FAIRCHEM GENESIS	PAN	TCO	14,281	134	1
FAIRCHEM MUSTANG	PAN	TCH	19,997	145	2
FAIRCHEM PEGASUS	MHL	TCO	19,822	145	1
FAIRCHEM UNICORN	MHL	TCO	19,817	144	1
FORMOSA FOURTEEN	LBR	TCO	45,694	180	1
FORMOSA SIX	LBR	TCH	35,622	167	1
FORMOSA TEN	LBR	TCH	36,233	175	2
FOUR SCHOONER	CYM	TPD	72,500	219	3
FR8 ENDEAVOUR	MHL	TPD	50,546	183	1
FR8 VENTURE	MHL	TCR	69,999	229	3
FREJA ATLANTIC	DIS	TCO	45,395	183	1
FREJA BALTIC	PAN	TPD	47,548	183	1
FRONT GLORY	NIS	TCR	149,834	269	1
FUJI SPIRIT	BHS	TCR	106,360	241	2
FUJIGAWA	PAN	TCO	17,845	149	5
GAN-VALOUR	BHS	TCO	46,702	185	1
GAS ORIENTAL	MLT	LPG	26,534	174	1
GENMAR KARA G.	LBR	TCR	150,296	274	1
GHETTY BOTTIGLIERI	ITA	TCH	40,165	176	1
GINGA EAGLE	PAN	TCO	19,999	154	8
GINGA FALCON	PAN	TCO	19,998	153	4
GINGA KITE	PAN	TCO	18,700	148	3
GINGA MERLIN	PAN	TCH	19,999	147	6
GODAVARI SPIRIT	BHS	TCR	159,106	274	1
GREEN PARK	GBR	TCH	19,500	145	1
GULF GRACE	BHS	TCH	65,017	219	1
GULF PEARL	BHS	TCO	74,999	228	1

## Appendix I

Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
GULF STREAM	BHS	TPD	74,999	228	2
HAMANE SPIRIT	BHS	TCR	105,203	236	3
HELLAS PROGRESS	GRC	TPD	46,152	183	1
HELLESPONT PROTECTOR	LBR	TPD	73,721	229	1
HELLESPONT TATINA	MHL	TCR	105,535	239	2
HELLESPONT TRIUMPH	LBR	TCR	157,046	274	1
HIGH PERFORMANCE	LBR	TCH	51,302	183	1
HIGH POWER	PAN	TPD	46,866	180	1
HIGH PROSPERITY	SGP	TPD	48,400	180	2
HMI BRENTON REEF	USA	TCO	45,671	183	2
HRVATSKA	HRV	TCR	166,739	280	1
IBLEA	LBR	TCR	10,584	240	5
ICE FIGHTER	LBR	TCR	64,997	228	2
ICE VICTORY	LBR	TCR	70,372	229	2
IKAROS	BHS	TPD	72,000	229	3
INCA	GRC	TPD	68,467	228	2
INDIAN POINT	ITA	TCH	50,922	183	2
ISLAND TRADER	CAN	OTB	10,994	112	1
IVY GALAXY	HKG	TCH	19,500	146	4
JAG PUSHPA	IND	TCO	47,848	183	1
JOELMARE	LBR	TCR	71,055	228	1
JOVALAN	USA	OTB	7,900	91	6
KAMOGAWA	PAN	TCO	17,712	149	3
KIHULAND	MLT	TCH	22,717	161	1
KING DORIAN	MHL	TPD	73,611	229	1
KINUGAWA	PAN	TCO	24,743	160	1
KISOGAWA	PAN	TCH	17,739	140	4
KLAMATH	USA	OTB	9,931	107	1
KODIAK	USA	TCR	124,822	252	3
KRONBORG	LBR	TCO	39,999	176	1
KWK ESTEEM	SGP	TCR	105,342	256	1
LAPTEV SEA	LBR	TCO	47,314	175	1
LAUREL GALAXY	PAN	TCO	19,805	143	1
LEO	USA	OTB	9,000	97	4
LIAN SHUN HU	CHN	TCR	71,956	229	1

## Appendix I

Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
LIAN YUN HU	CHN	TCR	75,493	229	2
LODESTAR GRACE	PAN	TCH	14,298	134	1
LOVEL BRIERE	USA	OTB	8,864	88	11
LUZON SPIRIT	BHS	TCR	98,629	245	1
MAERSK BERING	SGP	TCO	29,058	176	21
MAERSK JEWEL	SGP	LPG	29,190	180	8
MAERSK RADIANT	SGP	TPD	35,186	171	4
MAGELLAN ENDEAVOUR	PAN	TCR	47,931	180	1
MAPLE EXPRESS	PAN	TPD	45,798	181	1
MAPLE GALAXY	PAN	TCO	19,386	148	1
MARE CARIBBEAN	MHL	TPD	46,700	183	1
MARITIME GISELA	HKG	TCO	29,999	180	1
MARITIME KELLY ANNE	MYS	TCO	44,488	180	2
MARITIME TUNTIGA	MYS	TCO	44,508	180	2
MATSUKAZE	PAN	TCO	17,676	150	1
MAURANGER	NIS	TCH	33,695	183	1
MAYA	GRC	TCR	68,500	228	1
MERIOM BREEZE	MHL	TPD	38,875	174	1
MERIOM ROSE	MHL	TCO	38,385	183	1
MERLIN CHAMPION	LBR	TPD	37,687	171	1
MERLIN EXPLORER	LBR	TCO	38,234	183	1
MILTADIS M II	LBR	TCR	162,936	281	1
MINERVA ANNA	GRC	TCO	49,990	183	1
MINERVA JULIE	GRC	TPD	46,270	182	1
MINERVA VASO	GRC	TCH	49,990	183	1
MINERVA XANTHE	MLT	TCH	50,922	183	1
MISSISSIPPI VOYAGER	USA	TPD	46,094	183	20
MONTEREY BAY	USA	OTB	14,589	116	20
MORRO BAY	USA	OTB	14,589	117	18
NEAPOLIS	GRC	TPD	74,543	229	8
NESTOS	LBR	TPD	61,000	214	1
NEW ADVANCE	LBR	TCR	105,670	239	1
NEW ALLIANCE	LBR	TCR	106,118	240	1
NEW CONFIDENCE	MHL	TPD	73,897	228	2
NEW CONSTELLATION	MHL	TPD	73,911	229	1

## Appendix I

Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
NORD OPTIMISER	LBR	TPD	47,371	183	1
NORD PRINCESS	DIS	TPD	38,554	183	1
NS CENTURY	LBR	TCR	105,926	244	1
NS SPIRIT	LBR	TPD	46,941	183	1
OLYMPIC FLAIR	GRC	TCR	149,817	274	1
OLYMPIC SPIRIT	USA	OTB	13,366	113	9
OMEGA EMMANUEL	LBR	TPD	72,935	228	6
OMEGA LADY SARAH	MHL	TPD	71,498	228	5
OMEGA PRINCESS	MHL	TCO	36,660	184	1
OMEGA THEODORE	LBR	TPD	73,673	228	3
ORION VOYAGER	BHS	TCR	156,447	275	40
OVERSEAS ALCMAR	MHL	TCO	45,800	183	2
OVERSEAS CLELIAMAR	MHL	TCR	68,600	266	1
OVERSEAS GOLDMAR	MHL	TPD	69,684	228	3
OVERSEAS HOUSTON	USA	TPD	46,815	183	11
OVERSEAS JADEMAR	MHL	TCR	69,697	228	1
OVERSEAS LIMAR	MHL	TCO	46,170	188	1
OVERSEAS LONG BEACH	USA	TPD	46,812	183	9
OVERSEAS LOS ANGELES	USA	TPD	46,817	183	18
OVERSEAS LUZON	MHL	TPD	74,908	228	2
OVERSEAS NEDIMAR	MHL	TPD	43,999	183	3
OVERSEAS ORION	HKG	TCO	51,218	183	2
OVERSEAS PEARLMAR	MHL	TCR	69,250	219	4
OVERSEAS PUGET SOUND	USA	TPD	50,860	200	19
OVERSEAS REGINAMAR	MHL	TPD	70,312	228	2
OVERSEAS REYMAR	MHL	TPD	69,636	219	1
OVERSEAS ROSEMAR	MHL	TCR	70,000	228	3
OVERSEAS SEXTANS	HKG	TCO	51,215	183	1
OVERSEAS SILVERMAR	MHL	TPD	69,609	228	2
OVERSEAS VISAYAS	MHL	TPD	74,933	228	7
PACIFIC	USA	OTB	9,540	101	4
PACIFIC RAINBOW	BHS	TPD	45,800	180	1
PACIFIC RUBY	SGP	TPD	46,851	183	1
PEAK	MLT	TCR	114,760	250	4
PENN NO.91	USA	OTB	15,225	126	11

## Appendix I

Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
PETROCHEM PRODUCER	USA	OTB	18,929	159	9
POLAR ADVENTURE	USA	TCR	141,740	272	10
POLAR DISCOVERY	USA	TCR	141,740	272	6
POLAR ENDEAVOUR	USA	TCR	141,740	273	6
POLAR ENTERPRISE	USA	TCR	141,740	273	13
POLAR RESOLUTION	USA	TCR	140,320	273	8
POLYAIGOS	GRC	TCR	69,510	228	2
PORT ARTHUR	LBR	TPD	41,490	181	1
POTOMAC	USA	OTB	13,150	113	1
PRETTY TIME	HKG	TCO	51,268	183	1
PRO GIANT	PAN	TPD	46,732	183	2
RIGEL	USA	OTB	12,249	101	11
ROYAL PERIDOT	MHL	TCO	13,090	129	1
S/R LONG BEACH	USA	TCR	214,853	300	16
SANKO BRAVE	SGP	TCR	105,672	239	1
SANKO BREEZE	PAN	TCO	105,721	239	2
SANKO COMMANDER	LBR	TCR	71,000	228	1
SANKO CONFIDENCE	LBR	TCR	71,024	228	1
SANKO DYNASTY	MHL	TCR	99,998	243	4
SANKO HARMONY	LBR	TPD	73,919	229	1
SASANOA	USA	OTB	7,343	101	8
SEABULK AMERICA	USA	TCH	4,312	181	8
SEABULK ARCTIC	USA	TPD	46,094	183	3
SEABULK PRIDE	USA	TPD	46,069	183	2
SIERRA	USA	TCR	124,777	264	1
SILVER LINING	PAN	TCO	46,013	179	1
SINBAD	BRB	TCH	44,999	183	1
SINGAPORE VOYAGER	SGP	TCR	105,850	240	1
SIRIUS VOYAGER	BHS	TCR	156,382	276	36
SITEAM MARS	MHL	TCH	42,010	184	1
SITEAM VOYAGER	SGP	TCO	46,190	183	1
SONANGOL KIZOMBA	BHS	TCR	159,165	274	1
SPRING LYRA	PAN	TCH	16,020	138	3
SPRING URSA	PAN	TCH	15,265	131	1
SPRING VIRGO	PAN	TCH	15,247	139	3

## Appendix I

Tank Vessel	Flag	Type	Deadweight	Length	Arrivals
SPRUCE GALAXY	PAN	TCO	19,995	148	1
STAVANGER BLOSSOM	PAN	TCR	105,641	239	3
STAVANGER VIKING	NIS	TCR	105,670	239	3
STELLAR LILAC	PAN	TCH	12,560	128	1
STENA COMPASS	BMU	TCR	72,000	230	1
STENA COMPATRIOT	BMU	TCR	72,736	229	1
STENA CONQUEST	ITA	TCH	47,000	182	2
STX ACE II	PAN	TCO	46,195	183	1
SUNLIGHT VENTURE	MHL	TCR	70,427	229	2
SUNSET BAY	USA	OTB	11,900	132	13
SYLVIE	HKG	LPG	26,500	174	1
SYMPHONY I	LBR	TCO	38,892	173	2
TAMBOV	LBR	TCO	40,727	180	1
TANJA JACOB	CYM	TCR	62,960	228	1
TARGALE	MHL	TCO	51,773	195	1
THEANO	GRC	TCO	47,198	182	1
TIMASHEVSK	LBR	TCO	40,727	180	1
TONEGAWA	PAN	TCH	17,722	149	4
TORM ANNA	DIS	TPD	74,999	228	2
TORM ANNE	SGP	TPD	44,900	181	1
TORM GUNHILD	DIS	TPD	44,999	181	1
TORM NECHES	SGP	TCO	47,052	182	1
TORM SARA	SGP	TCR	72,718	228	1
TORM THYRA	DIS	TPD	45,950	183	1
TROGIR	MLT	TCO	39,999	181	1
UMLMA	QAT	TCR	106,005	244	1
UNIQUE SUNSHINE	HKG	TCO	47,087	182	1
UNITED AMBASSADOR	LBR	TPD	74,500	229	3
UNITED CARRIER	LBR	TPD	74,500	229	4
VEGA VOYAGER	BHS	TCR	104,864	243	1
VINALINES GALAXY	VNM	TCO	50,530	183	1
VOIDOMATIS	LBR	TPD	61,000	213	2
WALTZ	LBR	TCR	141,700	274	1
WASHINGTON VOYAGER	USA	TPD	39,796	198	28
WHITE DOLPHIN	ITA	TPD	72,346	228	1

## Appendix I

<b>Tank Vessel</b>	<b>Flag</b>	<b>Type</b>	<b>Deadweight Length</b>		<b>Arrivals</b>
XANTHOS	LBR	TPD	61,000	213	1
ZALIV AMERIKA	CYP	TCR	104,535	244	1
ZALIV AMURSKIY	LBR	TCR	104,542	244	1
ZANIS GRIVA	LBR	TCH	17,585	152	1
ZHONG JI NO.1	HKG	TPD	46,346	185	1
					<b>1,120</b>

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.<sup>1</sup>

## **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.

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.

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<sup>1</sup> The US Coast Guard NAVSAC Committee has endorsed a command language, and it is in use in many ports around the United States.

**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.

# San Francisco Bay PORTS



## **Vehicular Bridges: Characteristics and Construction**

Significant bridge projects presently underway in the San Francisco Bay Area:

- The over water portion of the San Francisco-Oakland Bay Bridge seismic retrofit west of YBI, has been completed. Information on maintenance travelers that may reduce vertical clearance provided by the bridge, has been added to the U.S. Coast Pilot. The replacement of the east section of the bridge between YBI and Oakland is in progress. The reasonable needs of navigation are being met during the work. Updates continue via Local Notices to Mariners and Broadcast Notices to Mariners. The estimated completion date for the project, including removal of the replaced bridge, is 2018.
- The ongoing 2009 Richmond-San Rafael Bridge fender repair has been coordinated with waterway users by the Eleventh Coast Guard District, and is expected to be completed by June 2009.
- The replacement of the 1927, I-80 Carquinez bridge, with a suspension bridge, and the seismic retrofit of the upstream bridge were completed in 2004. The replaced (1927) bridge has been removed completely from the waterway. Chart updates are in progress with NOAA.
- The new I-680 Benicia-Martinez Highway Bridge construction and chart updates have been completed.
- The Union Pacific Railroad drawbridge had an engineering study documenting the maximum safe operating wind speed for the drawspan, as 35 mph (30.41 kts). The SF HSC coordinated with NOAA and Union Pacific Railroad, for installation of a new PORTS wind speed sensor on the drawbridge, providing real time information on wind speed, via the Internet. Improved communications and coordination between bridge and vessel operators continues to result in minimal negative impacts to navigation, due to routine bridge operation.
- Caltrans has proposed seismic retrofits of the Antioch Hwy Bridge and the Dumbarton Hwy Bridge, during or after 2010. The Eleventh Coast Guard District is coordinating with the bridge owner and other agencies to ensure the proposed work will not have negative impacts on the reasonable needs of waterway traffic, during or after the proposed work. A Coast Guard Bridge Permit, pursuant to the General Bridge Act of 1946, will most likely be required for the work at the Dumbarton Hwy Bridge, and is subject to the provisions of the National Environmental Policy Act. No permit is expected for work at the Antioch Bridge due to no changes in the navigational clearances, as a result of the retrofit.

## Appendix L

- In 2008 Caltrans replaced all bridge mounted RACONS on their bridges in the San Francisco Bay Area. The new units should provide improved reliability and less outages during the next few years.
- San Mateo Transit District is proposing to replace the drawspan of the Dumbarton railroad drawbridge and resume usage of the bridge for commuter and freight rail traffic, sometime after 2013. The Eleventh Coast Guard District is coordinating with the bridge owner and other agencies to ensure the proposed work will not have negative impacts on the reasonable needs of waterway traffic, during or after the proposed work. A Coast Guard Bridge Permit, pursuant to the General Bridge Act of 1946, will most likely be required for the work, and is subject to the provisions of the National Environmental Policy Act.

**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)

<u>BRIDGE NAME AND LOCATION</u>	<u>TYPE</u>	<u>CLEARANCES</u>	
		<u>Horz</u>	<u>Vert MLLW-MHW</u>
1. <b>Golden Gate Bridge</b> San Francisco Bay	SUS	4028	238-232
2. <b>San Francisco-Oakland</b> San Francisco Bay, Westerly Reach	SUS		
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. <b>Richmond-San Rafael</b> San Francisco Bay	F		
Main Channel, Center Span		1000	190-185
Left and Right Span		480	173-168
East Channel, Center Span		970	140-135
4. <b>Carquinez I-80 Hwy Bridge</b> Carquinez Strait, Vallejo	F		
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 I-80 Hwy Bridge was replaced with a suspension bridge that exceeds vertical and horizontal navigational clearances provided by the adjacent "upstream" bridge. RACONS were also retained on the upstream bridge.			
5. <b>Benicia-Martinez, I-680S Hwy Bridge</b>	F		
Benicia-Martinez		440	141-135
6. <b>Benicia-Martinez, I-680N Hwy Bridge</b>	F		
The recently constructed Benicia-Martinez (northbound hwy traffic) bridge exceeds vertical and horizontal navigational clearances provided by the adjacent railroad drawbridge and the I-680S fixed bridge.			
7. <b>Benicia-Martinez, Union Pacific RR Bridge</b>			V/L
Benicia-Martinez	Raised	291	140-135
	Lowered		291/75-70
7. <b>Antioch</b> Antioch, CA – San Joaquin River	F	400	142-13

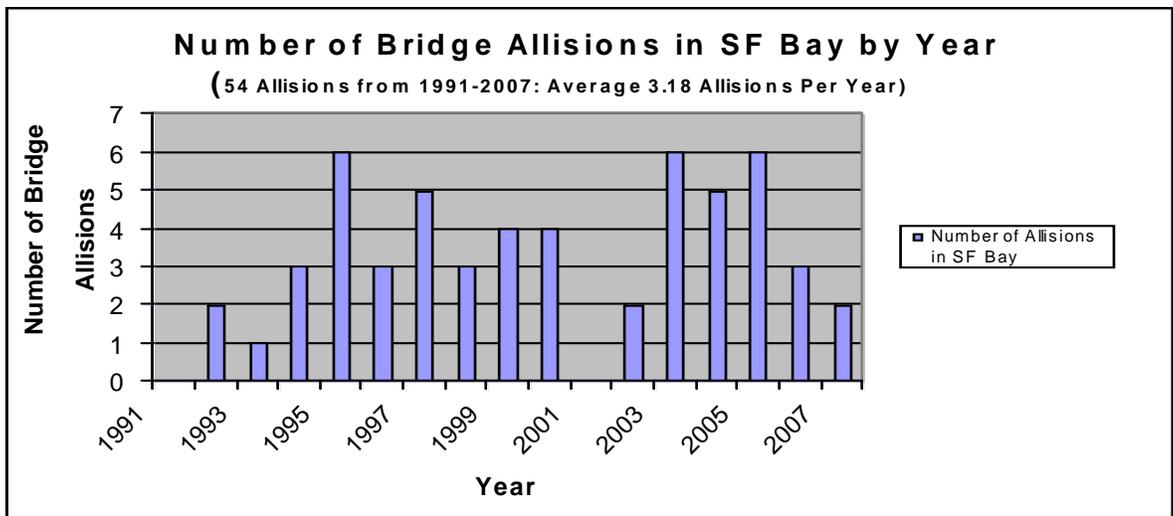
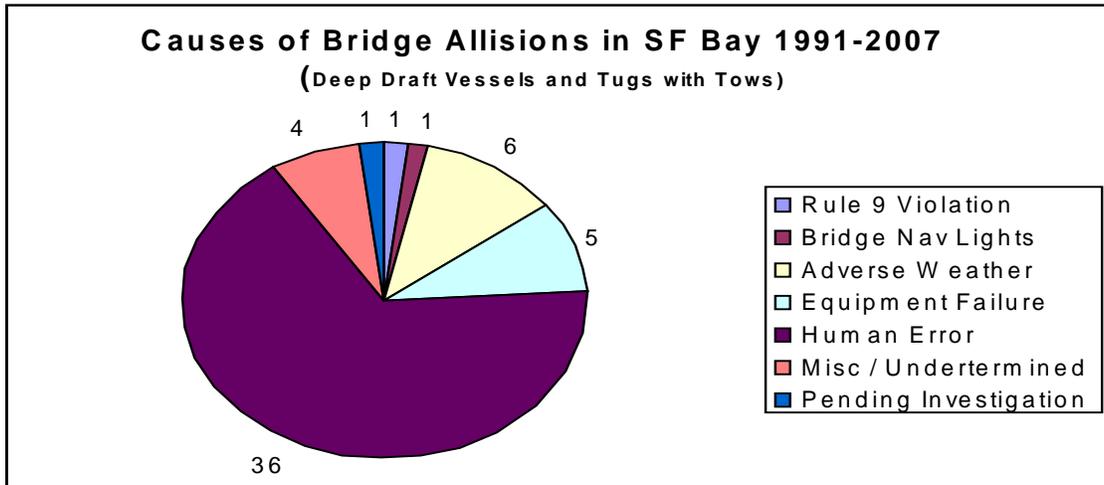
**Vehicular Bridge Inventory****Vehicular Bridge Management****Bridges Encountered By Ocean Going Vessels**

(For up to date clearance information refer to the latest NOAA chart or the USCG Bridge Section)

<u>BRIDGE NAME AND LOCATION</u>	<u>TYPE</u>	<u>CLEARANCES</u>
		<u>Horz/Vert MLLW-MHW</u>
8. <b>Golden Gate Bridge</b> San Francisco Bay	SUS	4028/238-232
9. <b>San Francisco-Oakland</b> San Francisco Bay, Westerly Reach	SUS	
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
10. <b>Richmond-San Rafael</b> San Francisco Bay	F	
Main Channel, Center Span		1000/190-185
Left and Right Span		480/173-168
East Channel, Center Span		970/140-135
11. <b>Carquinez</b> Carquinez Strait, Vallejo	F	
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
12. <b>Martinez, Highway Bridge</b> Martinez/Benicia	F	440/141-135
13. <b>Martinez, Union Pacific RR Bridge</b> Martinez/Benicia,	V/L Raised Lowered	291/140-135 291/75-70
7. <b>Antioch</b> Antioch, CA – San Joaquin River	F	400/142-138

## Bridge Allision Statistics for Bay Area and Delta from 1991-2007

Total allisions: 288  
 Total allisions involving bridges: 54  
 Number of bridges over shipping lanes: 31



Note: No data exists for \$\$ amount of damage to bridges, but a 2003 National Coast Guard Study indicates only 14% of allisions resulted in more that \$25,000 in damage.

**Sector San Francisco - Port Safety Statistics: 2007**

**Total Reported Marine Casualties By Type/Month for 2007 - Chart 1**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals	Avg per month
Allision / Collision	1	0	0	0	0	2	0	2	0	1	1	0	7	0.58
Groundings / Sinkings	2	1	2	0	0	1	0	1	1	0	0	1	9	0.75
Fire	0	0	0	0	0	0	0	1	0	0	0	0	1	0.08
Propulsion / Electrical	1	3	3	2	1	0	3	4	2	1	2	0	22	1.83
Steering	0	0	1	0	1	0	0	0	0	0	0	0	2	0.17

**Total Reported Marine Casualties By Type/Year - Chart 2**

	2005 Year*	2006 Year	2007 Year	Total	Avg
Allision / Collision	8	16	7	31	10
Groundings / Sinkings	2	11	9	22	7
Fire	3	1	1	5	2
Propulsion / Electrical	8	19	22	49	16
Steering	2	6	2	10	3

\*2005 Data AUG-DEC

**Total Reported Marine Casualties By Vessel Type/Year - Chart 3**

	2005 Year	2006 Year	2007 Year	Total	Avg
Tank Vessel	7	1	4	12	4
Freight Vessel (Bulk or Container)	28	19	24	71	24
Passenger Vessel	9	5	7	21	7
Towing Vessel / Tug / Barge	9	21	9	39	13
Fishing Vessel	7	4	1	12	4

Appendix M

**Total Reported Marine Casualties By Vessel Type/Month for 2007 - Chart 4**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals	Avg per month
Tank Vessel	2	0	0	0	0	0	0	2	0	0	0	0	4	0.3
Freight / Container Ship	3	4	0	2	2	2	2	2	3	2	2	0	24	2.0
Passenger (Deep Draft or T-Boat)	3	0	2	0	0	1	0	0	0	0	0	1	7	0.6
Towing Vessel or Tug / Barge	1	0	2	1	0	1	1	2	0	1	0	0	9	0.8
Commercial Fishing Vessel	0	0	0	0	0	0	0	0	1	0	0	0	1	0.1

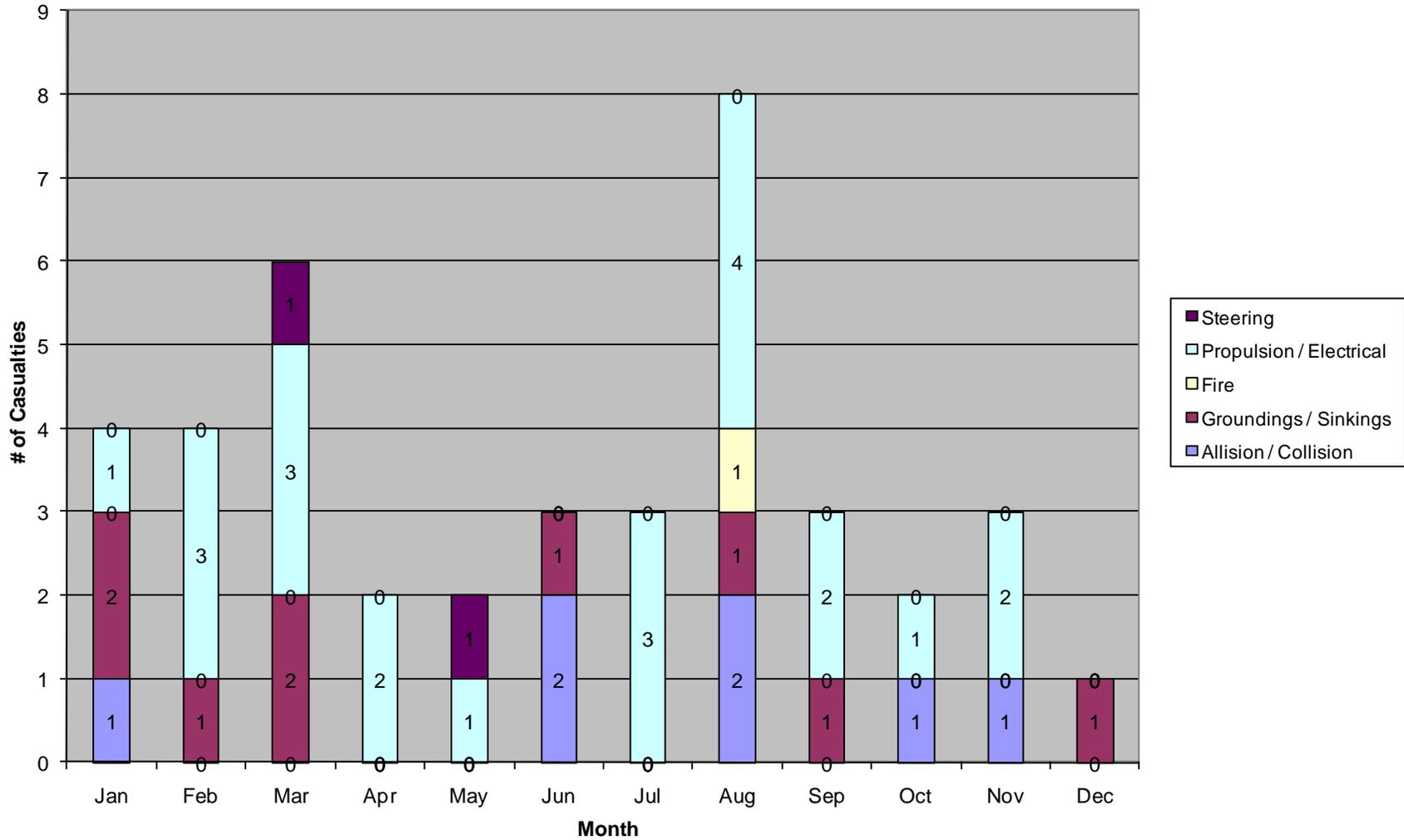
**Total Letters of Deviation (LODs) Issues Due to Navigational Deficiencies/Month for 2007 - Chart 5**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals	Avg per month
Radar	1	4	1	2	5	1	1	5	2	4	2	0	28	2.3
Gyro Compass	1	1	0	0	1	0	0	0	0	1	0	3	7	0.6
Steering	1	0	0	0	0	0	0	0	0	0	0	0	1	0.1
Echo Depth Sounder	0	0	0	0	0	0	1	0	1	1	0	0	3	0.3
AIS	1	1	1	0	5	3	2	0	0	1	3	1	18	1.5

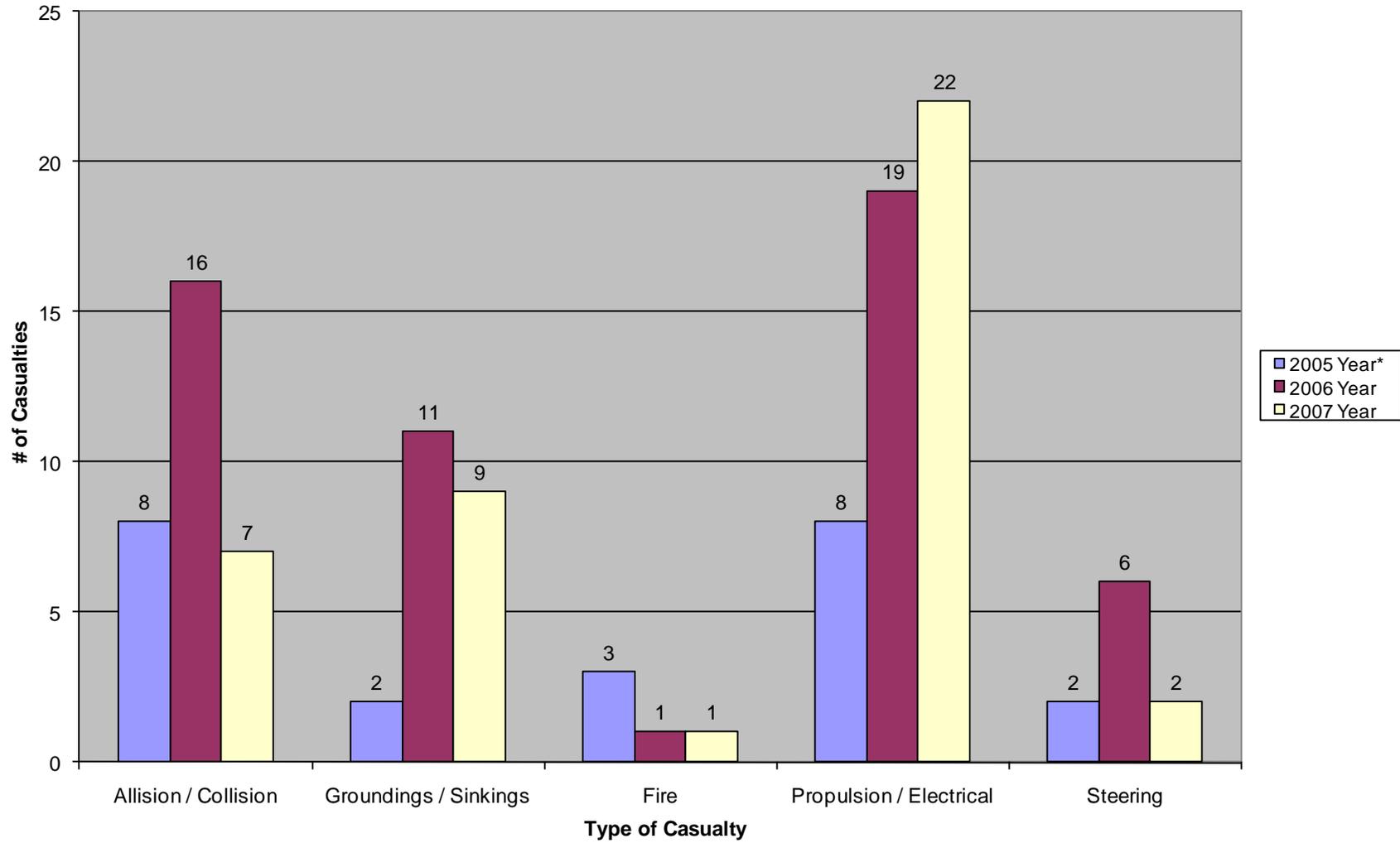
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals	Avg per month
<b>Reported Navigation Rule 9 Violations</b>	1	0	0	0	0	0	0	1	0	0	0	0	2	0.67

\*Note: Coast Guard Sector San Francisco - Port Safety Marine Casualty Data includes marine casualty reports within the inshore and offshore COTP SF Bay Zone. The data does not weigh impact, casualty severity, time, location, or effects and the casualty data is correlated to subject categories as accurate as possible.

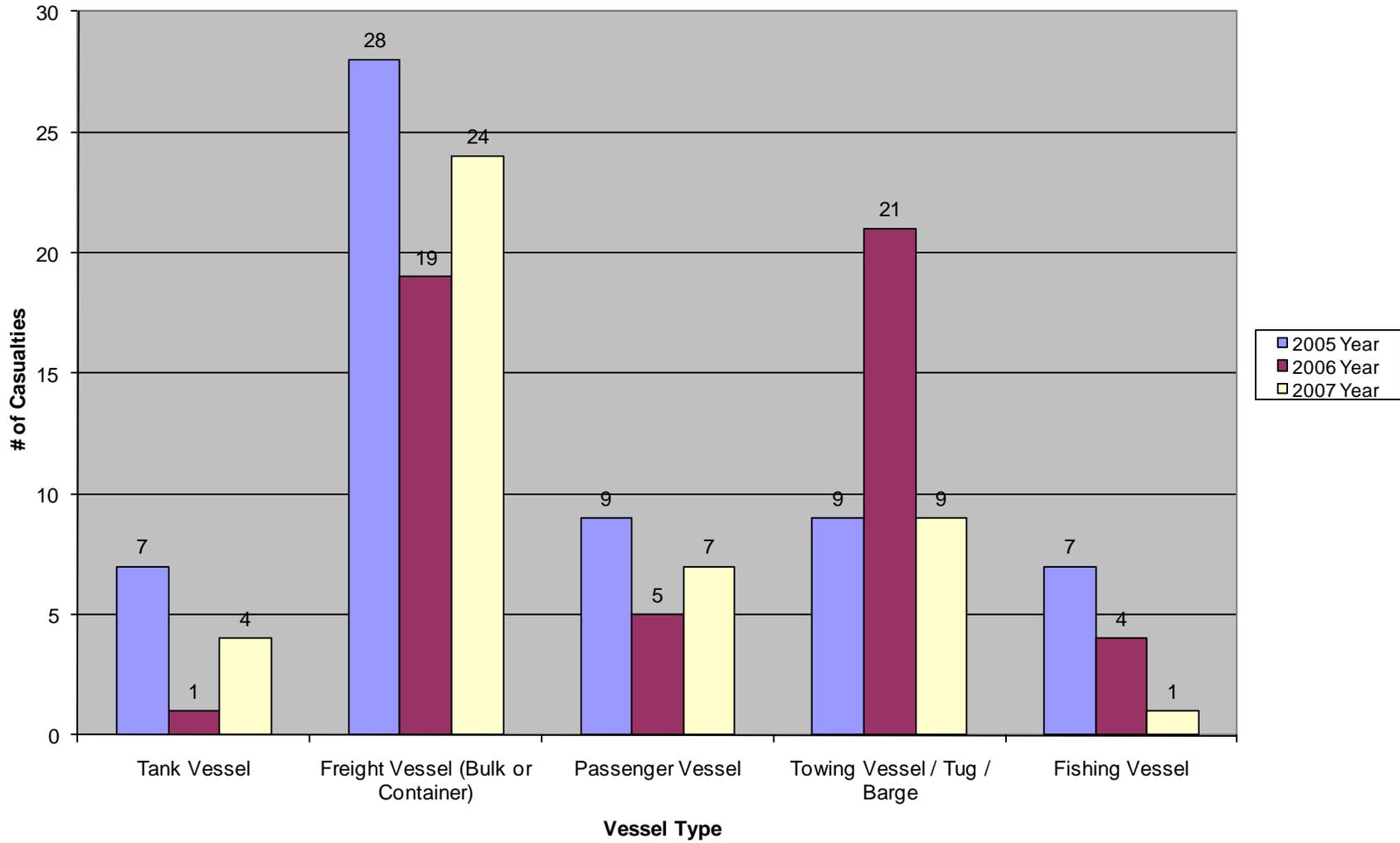
Chart 1: Total Reported Marine Casualties by Type/Month for 2007



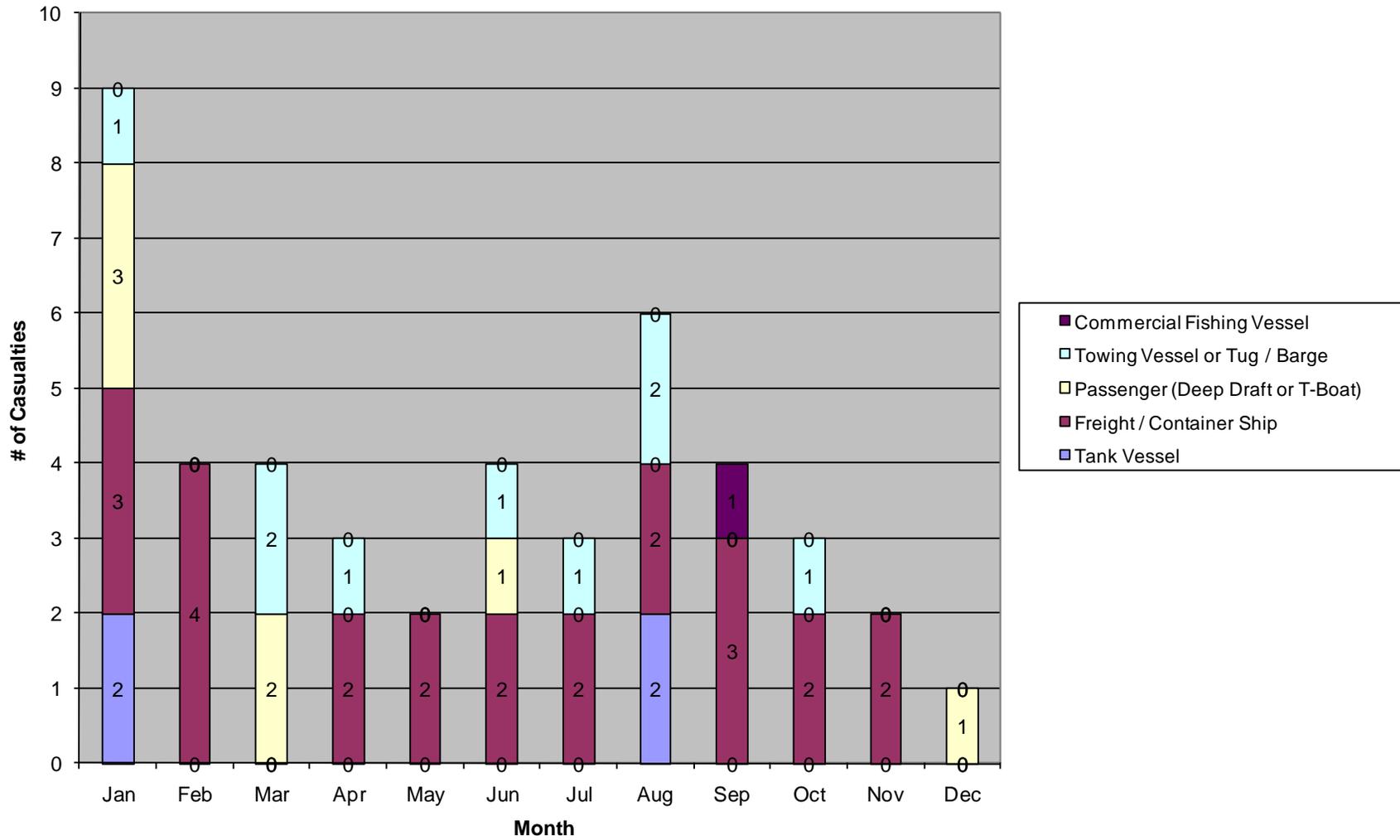
**Chart 2: Total Reported Marine Casualties By Type/Year**



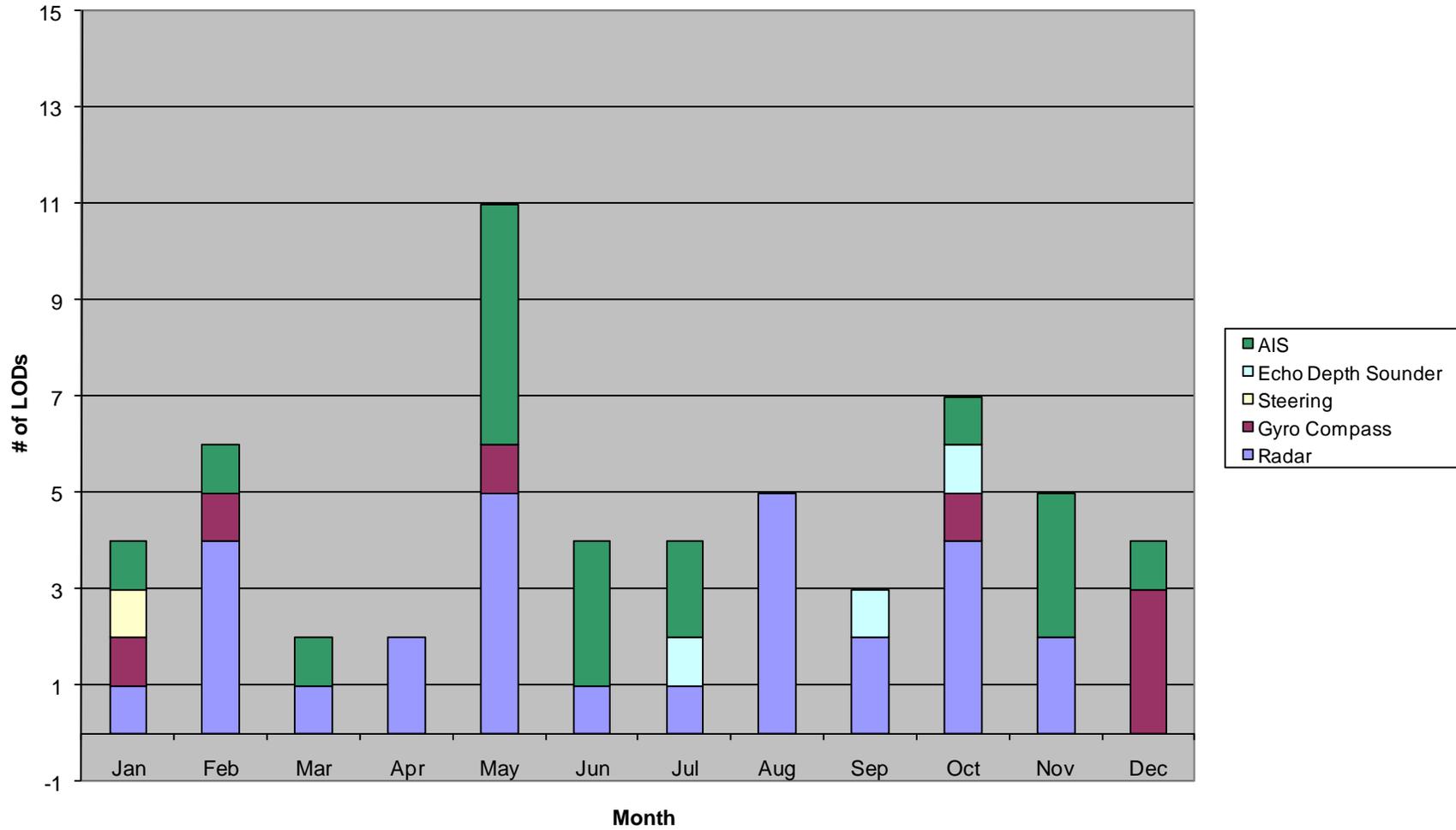
**Chart 3: Total Reported Marine Casualties by Vessel Type/Year**



**Chart 4: Total Reported Marine Casualties by Vessel Type/Month for 2007**



**Chart 5: Total Letters of Deviation (LODs) Issued Due to Navigational Deficiencies/Month for 2007**



**Sector San Francisco - Port Safety Statistics: 2008**

**Total Reported Marine Casualties By Type/Month for 2008 - Chart 1**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals	Avg per month
Allision / Collision	2	0	0	2	2	1	0	0	0	2	0	1	10	0.8
Groundings / Sinkings	1	0	0	0	0	0	0	0	1	0	1	1	4	0.3
Fire	0	0	0	0	0	0	1	0	0	0	0	0	1	0.1
Propulsion / Electrical	1	1	2	0	1	3	1	1	1	0	2	1	14	1.2
Steering	1	1	0	0	0	1	0	0	0	1	0	0	4	0.3

**Total Reported Marine Casualties By Type/Year - Chart 2**

	2005 Year*	2006 Year	2007 Year	2008 Year	Total	Avg
Allision / Collision	8	16	7	10	41	10
Groundings / Sinkings	2	11	9	4	26	7
Fire	3	1	1	1	6	2
Propulsion / Electrical	8	19	22	14	63	16
Steering	2	6	2	4	14	4
*2005 Data AUG-DEC						

**Total Reported Marine Casualties By Vessel Type/Year - Chart 3**

	2005 Year	2006 Year	2007 Year	2008 Year	Total	Avg
Tank Vessel	7	1	4	7	19	5
Freight Vessel (Bulk or Container)	28	19	24	17	88	22
Passenger Vessel	9	5	7	9	30	8
Towing Vessel / Tug / Barge	9	21	9	8	47	12
Fishing Vessel	7	4	1	1	13	3

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**Total Reported Marine Casualties By Vessel Type/Month for 2008 - Chart 4**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals	Avg per month
Tank Vessel	1	1	2	0	0	0	1	0	0	0	0	2	7	0.6
Freight / Container Ship	1	1	1	0	1	2	3	1	1	1	2	3	17	1.4
Passenger (Deep Draft or T-Boat)	0	0	0	1	2	2	0	2	0	1	1	0	9	0.8
Towing Vessel or Tug / Barge	3	1	0	2	1	0	0	0	0	1	0	0	8	0.7
Commercial Fishing Vessel	0	0	0	0	0	0	0	0	1	0	0	0	1	0.1

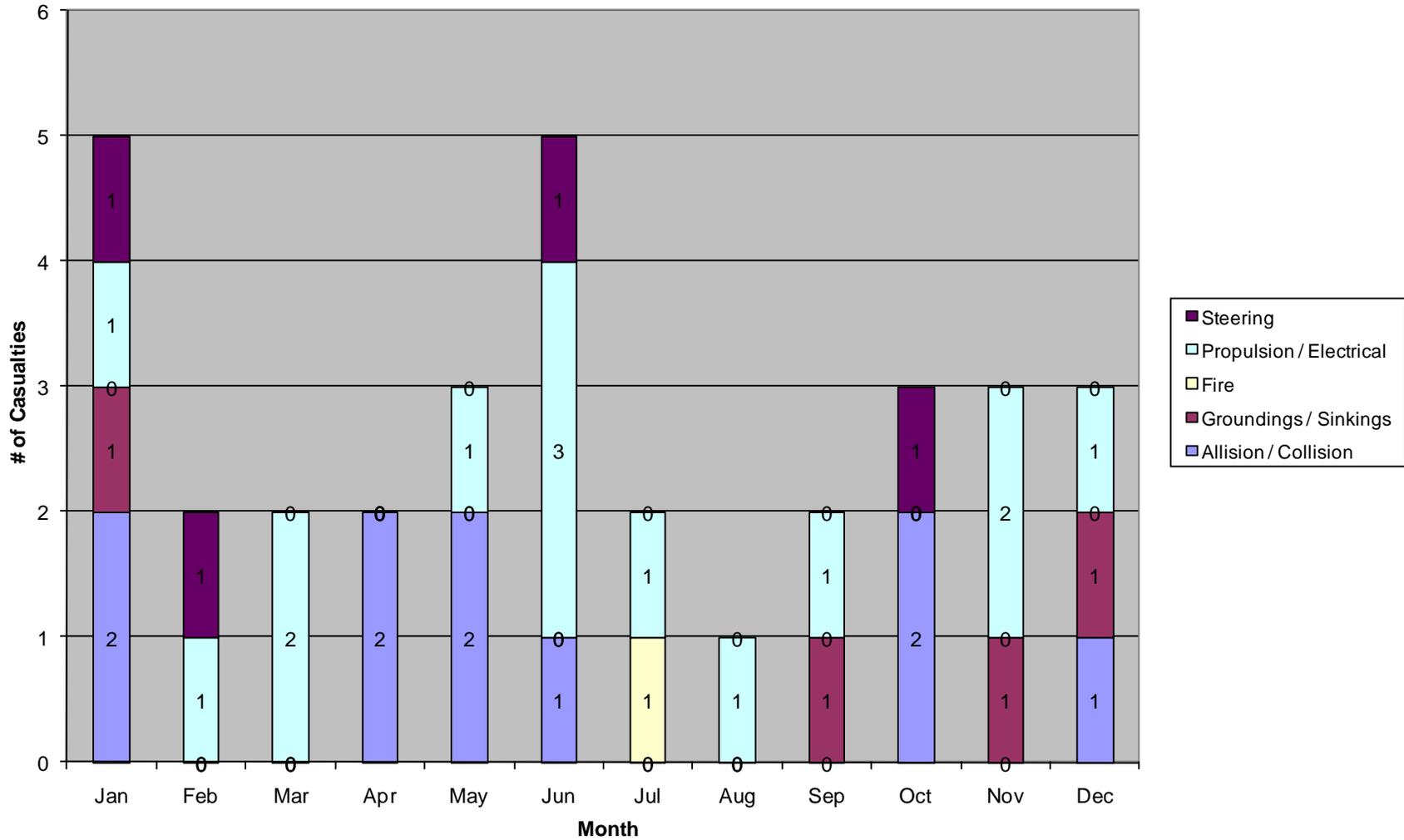
**Total Letters of Deviation (LODs) Issues Due to Navigational Deficiencies/Month for 2008 - Chart 5**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals	Avg per month
Radar	2	2	2	4	4	1	3	1	0	3	4	6	32	2.7
Gyro Compass	0	0	0	1	0	0	0	0	1	1	0	0	0	0.0
Steering	0	0	0	0	0	0	0	0	1	0	0	0	1	0.1
Echo Depth Sounder	0	1	1	0	0	0	0	0	1	0	0	0	3	0.3
AIS	1	0	1	0	2	0	1	2	0	0	0	2	9	0.8

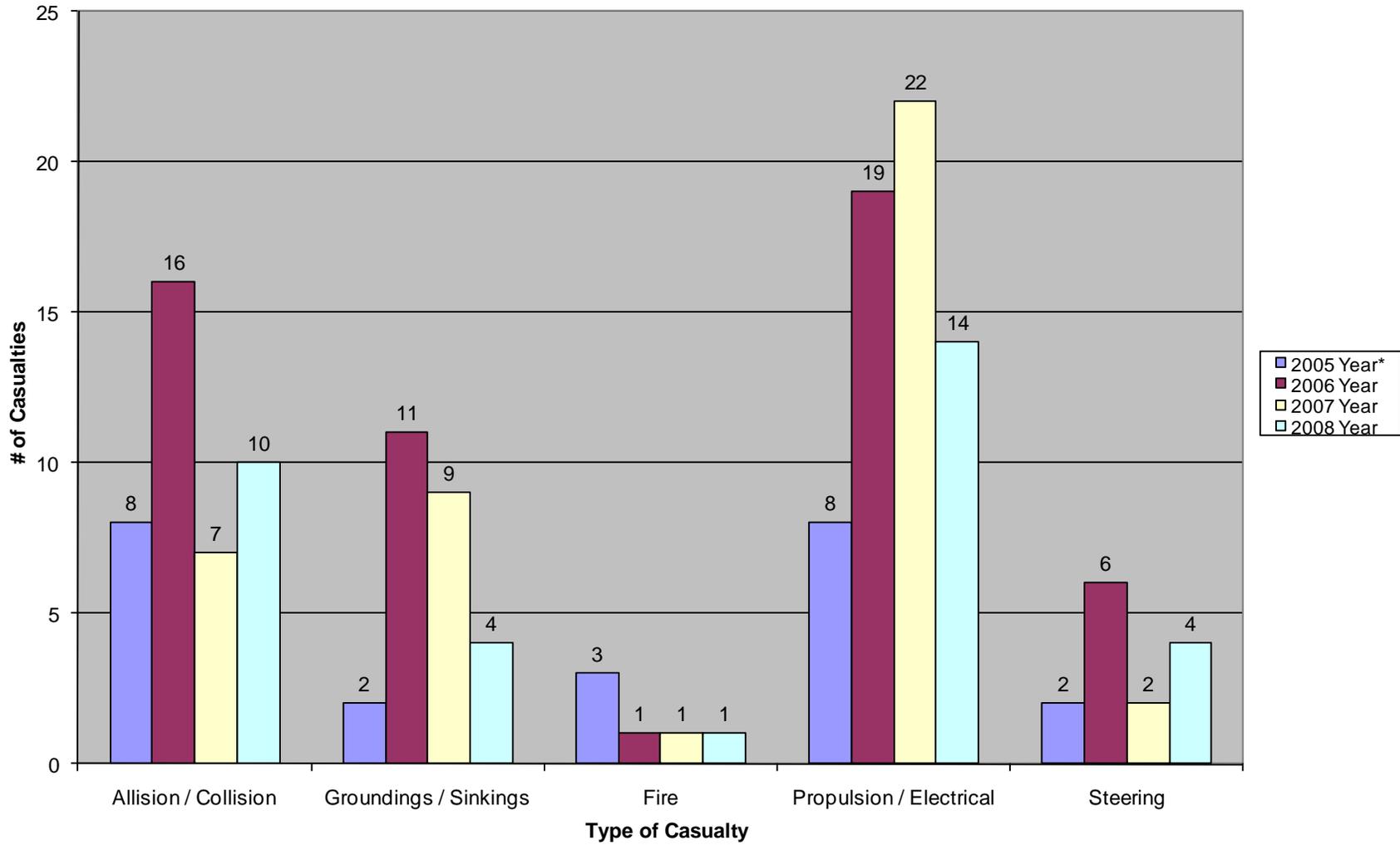
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals	Avg per month
<b>Reported Navigation Rule 9 Violations</b>	0	0	0	0	0	0	0	0	1	0	0	1	2	0.31

\*Note: Coast Guard Sector San Francisco - Port Safety Marine Casualty Data includes marine casualty reports within the inshore and offshore COTP SF Bay Zone. The data does not weigh impact, casualty severity, time, location, or effects and the casualty data is correlated to subject categories as accurate as possible.

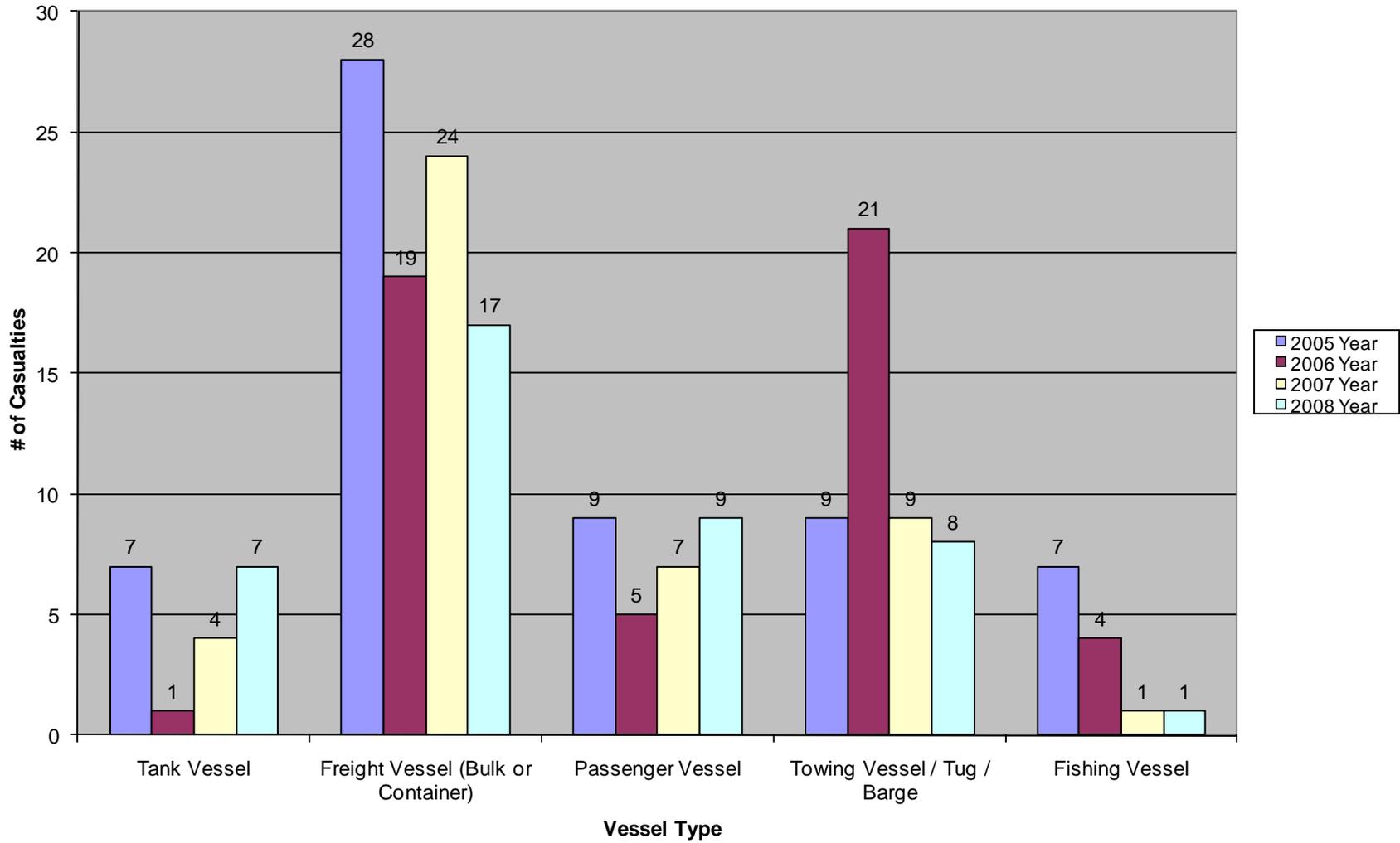
Chart 1: Total Reported Marine Casualties by Type/Month for 2008



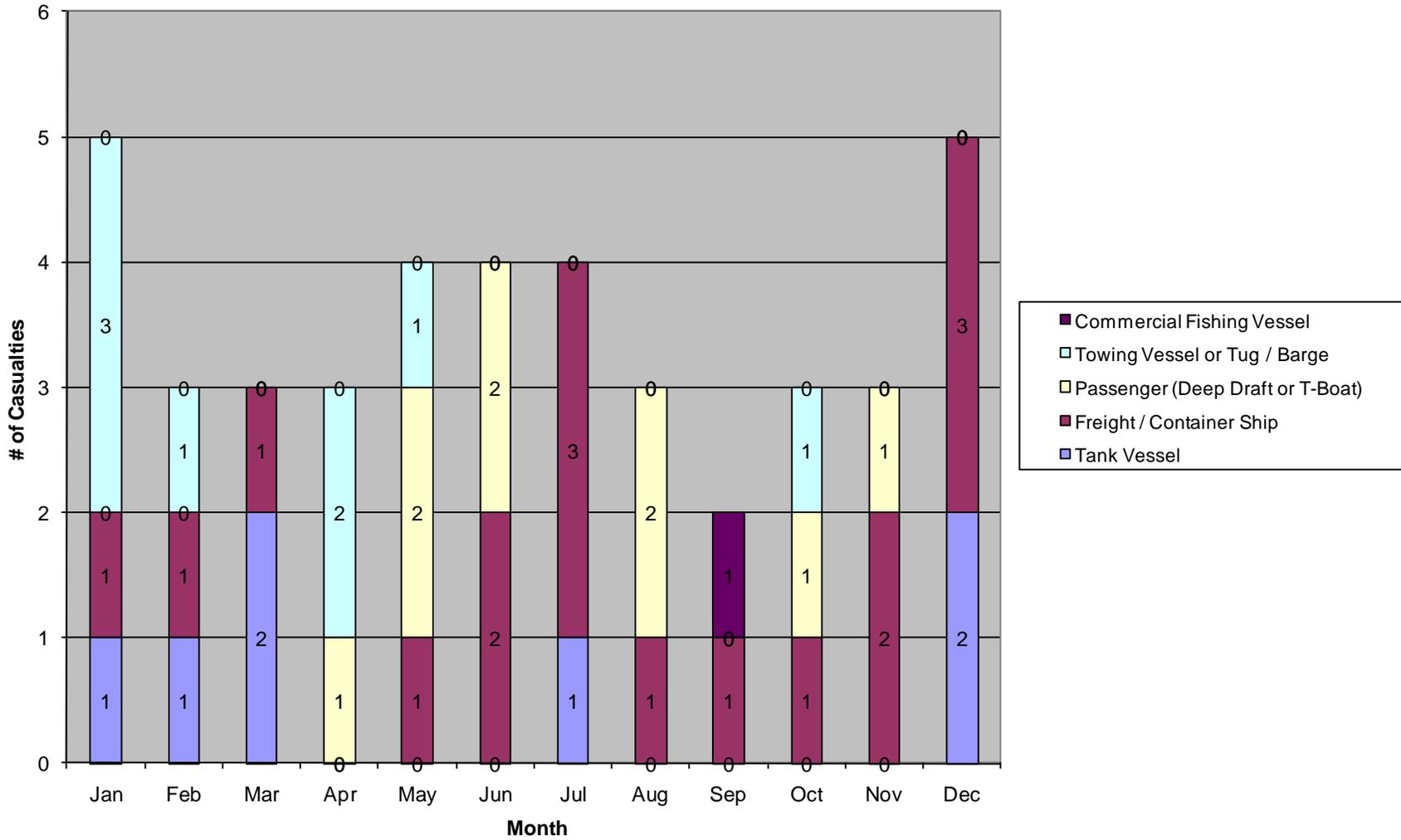
**Chart 2: Total Reported Marine Casualties By Type/Year**



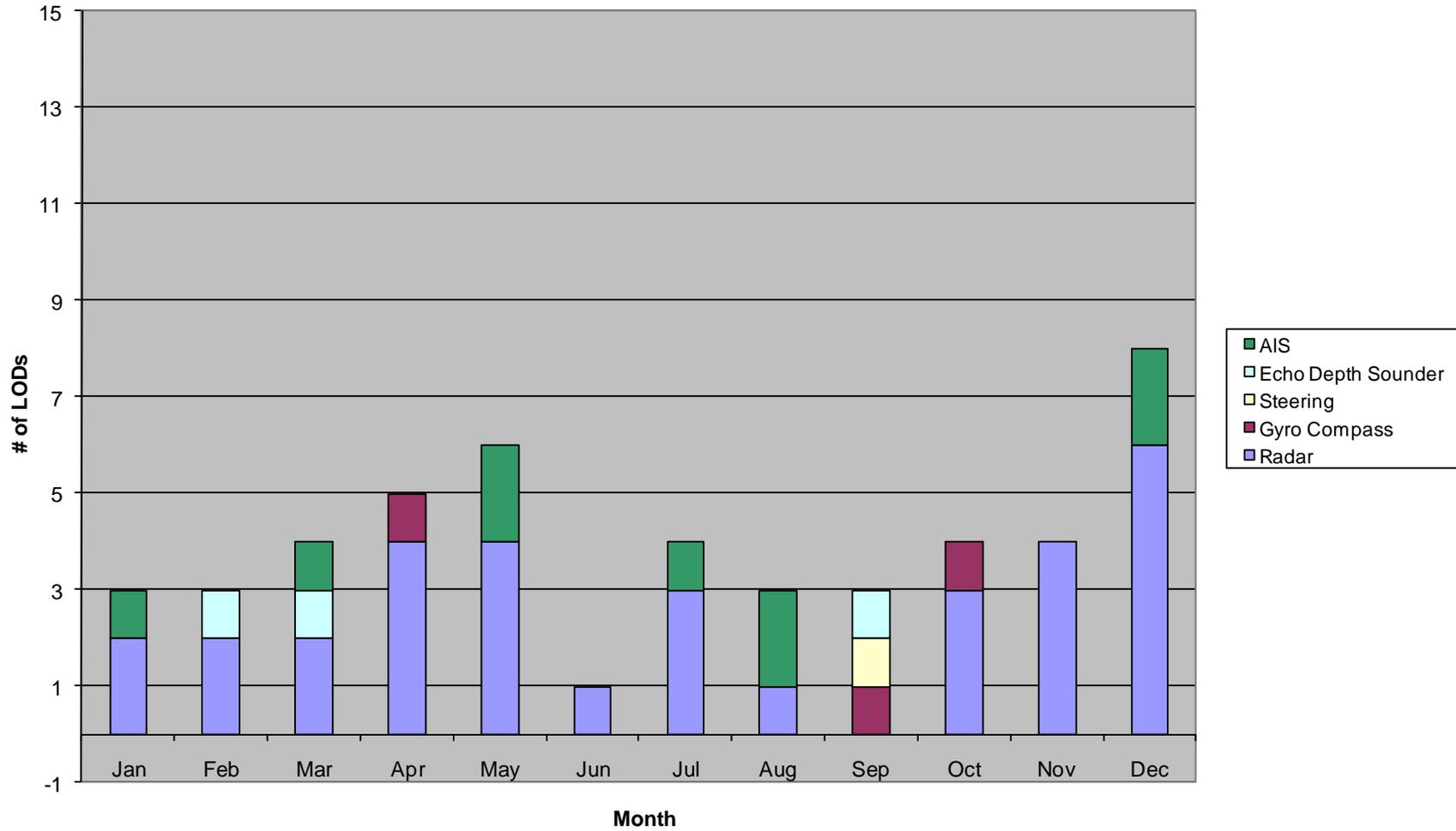
**Chart 3: Total Reported Marine Casualties by Vessel Type/Year**



**Chart 4: Total Reported Marine Casualties by Vessel Type/Month for 2008**



**Chart 5: Total Letters of Deviation (LODs) Issued Due to Navigational Deficiencies/Month for 2008**



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**Sector San Francisco Pollution Statistics January 1, 2007 to December 31, 2007**

**Total Reported Oil Pollution Incidents for Sector SF/Year - Chart 1**

	2000 Year	2001 Year	2002 Year	2003 Year	2004 Year	2005 Year	2006 Year	2007 Year	Total	Avg
Total Number of Oil Pollution Incidents	363	303	240	192	196	200	297	403	2194	274.25

**Total Reported Oil Spills By Source/Year - Chart 2**

	2000 Year	2001 Year	2002 Year	2003 Year	2004 Year	2005 Year	2006 Year	2007 Year	Total	Avg
Facility	75	67	31	30	34	21	79	118	455	56.88
Military / Public Vessel	7	3	12	6	8	2	15	11	64	8.00
Fishing Vessel	45	20	19	20	18	10	20	18	170	21.25
Commercial Vessel	20	5	3	2	18	21	35	23	127	15.88
Non-Commercial Vessel	77	59	62	50	30	59	54	69	460	57.50
Unknown Source	134	146	154	81	87	65	100	160	927	115.88

**Total Reported Oil Pollution Incidents/Month for 2007 - Chart 3**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	Avg
Total Number of Oil Pollution Incidents	36	33	8	31	33	19	35	50	29	32	44	53	403	34

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	Avg
Total Amount of Oil Discharged and/or Hazardous Material Released (gallons)	180	254	159	112	23	51	186	443	44	705	58096	133	60386	5032

**Total Amount of Oil and/or Hazardous Material Released by Vessels/Month for 2007 - Chart 4**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	Avg
Total Amount of Oil and/or Hazardous Material Released	9	39	8	46	14	27	174	65	44	655	58082	79	59242	4937

**Total Amount of Oil and/or Hazardous Material Released by Non-Vessel Sources/Month for 2007 - Chart 5**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	Avg
Total Amount of Oil and/or Hazardous Material Released	171	215	151	67	9	24	12	378	0	50	14	54	1145	95

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**Total Reported Oil Spills by Size/Month for 2007 - Chart 6**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	Avg
# of Spills between 0 - 10 gallons	24	16	7	18	32	9	23	28	11	11	19	25	223	19
# of Spills between 10 - 100 gallons	4	3	0	4	1	2	1	9	1	4	3	4	36	3
# of Spills between 100 - 1,000 gallons	0	1	1	0	0	0	1	1	0	1	0	0	5	0
# of Spills 1,000 gallons >	0	0	0	0	0	0	0	0	0	0	1	0	1	0

**Total Reported Oil Spills By Source/Month for 2007 - Chart 7**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	Avg
Facility / Non-Vessel Source	17	13	1	9	9	7	11	18	7	4	9	13	118	9.83
Military / Public Vessel	1	0	1	1	0	0	0	2	0	4	0	2	11	0.92
Fishing Vessel	2	1	0	1	2	1	1	2	2	3	1	4	20	1.67
Commercial Vessel	2	3	2	4	1	1	1	4	1	3	4	4	30	2.50
Non-Commercial Vessel	1	3	2	3	6	3	12	11	2	8	10	10	71	5.92
Unknown Source	13	13	2	13	15	8	10	13	17	12	20	24	160	13.33

**Penalty Action:**

Civil Penalty (MV)	0	0	3	0	0	0	0	0	0	1	1	0	5	0.41667
Civil Penalty (TK)	1	2	1	1	1	0	2	2	2	2	0	4	18	1.5
Letter of Warning (LOW)	3	4	2	5	1	2	3	2	2	6	3	2	35	2.91667

Please Note: Oil Discharge data includes all discharges within the USCG response zone, including wetlands and adjacent waterways.

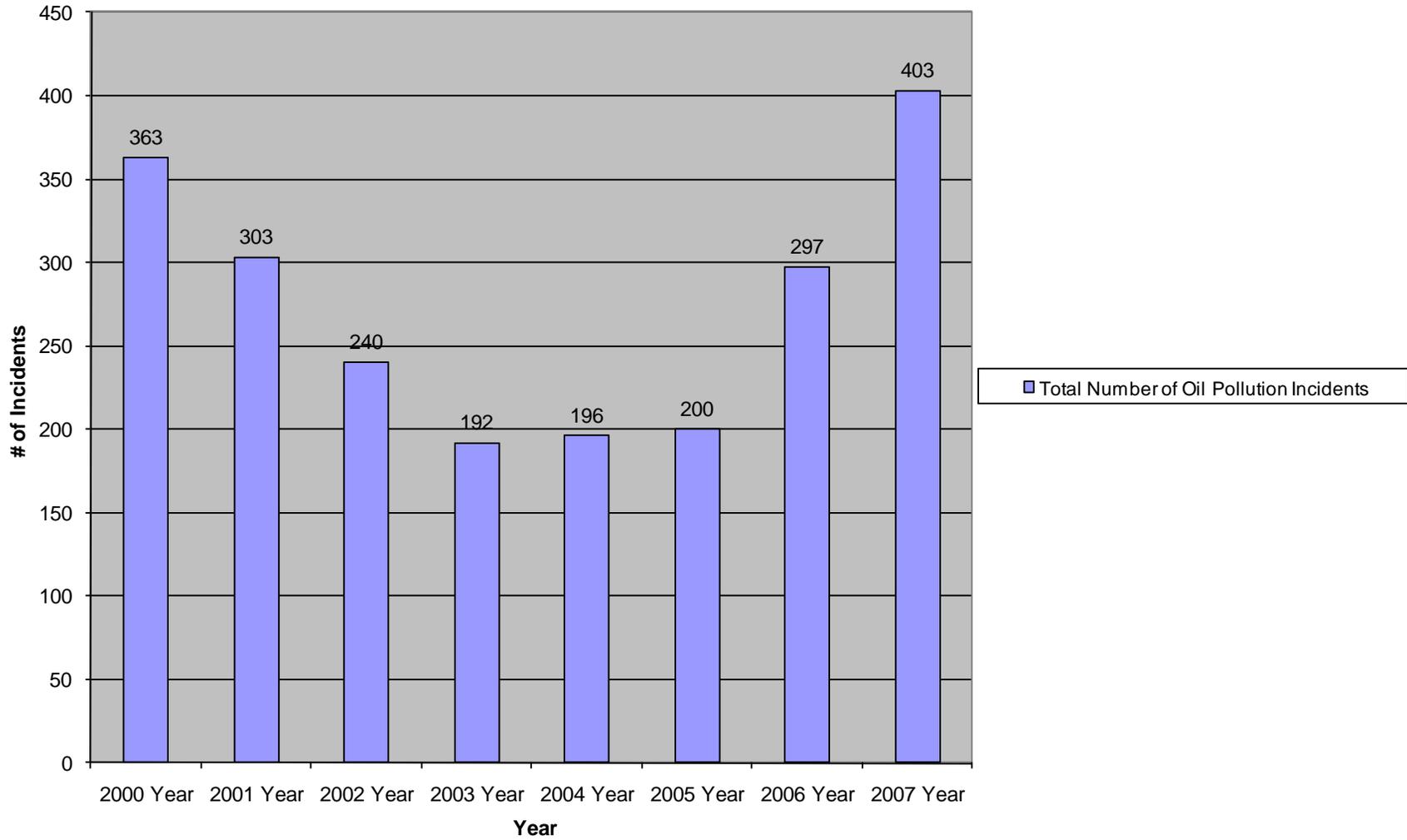
Appendix N

<b>Sector San Francisco Pollution Statistics: 2000 to 2007</b>										
	01-12/31/2000	01-12/31/2001	01-12/31/2002	01-12/31/2003	01-12/31/2004	01-12/31/2005	01-12/31/06	01-12/31/07	Totals	Average per year (2000-2007)
	2000 Year	2001 Year	2002 Year	2003 Year	2004 Year	2005 Year	2006 Year	2007 Year	Totals	Average per year (2000-2007)
<b>Total Reported Oil Pollution Incidents for Sector SF</b>	363	303	240	192	196	249	297	403	1994	285
<b>Penalty Action:</b>										
Civil Penalty (MV)	11	10	41	18	4	1	1	5	90	13
Civil Penalty (TK)	30	18	41	25	9	23	18	18	159	23
Letter of Warning	75	45	52	31	40	39	46	35	324	46

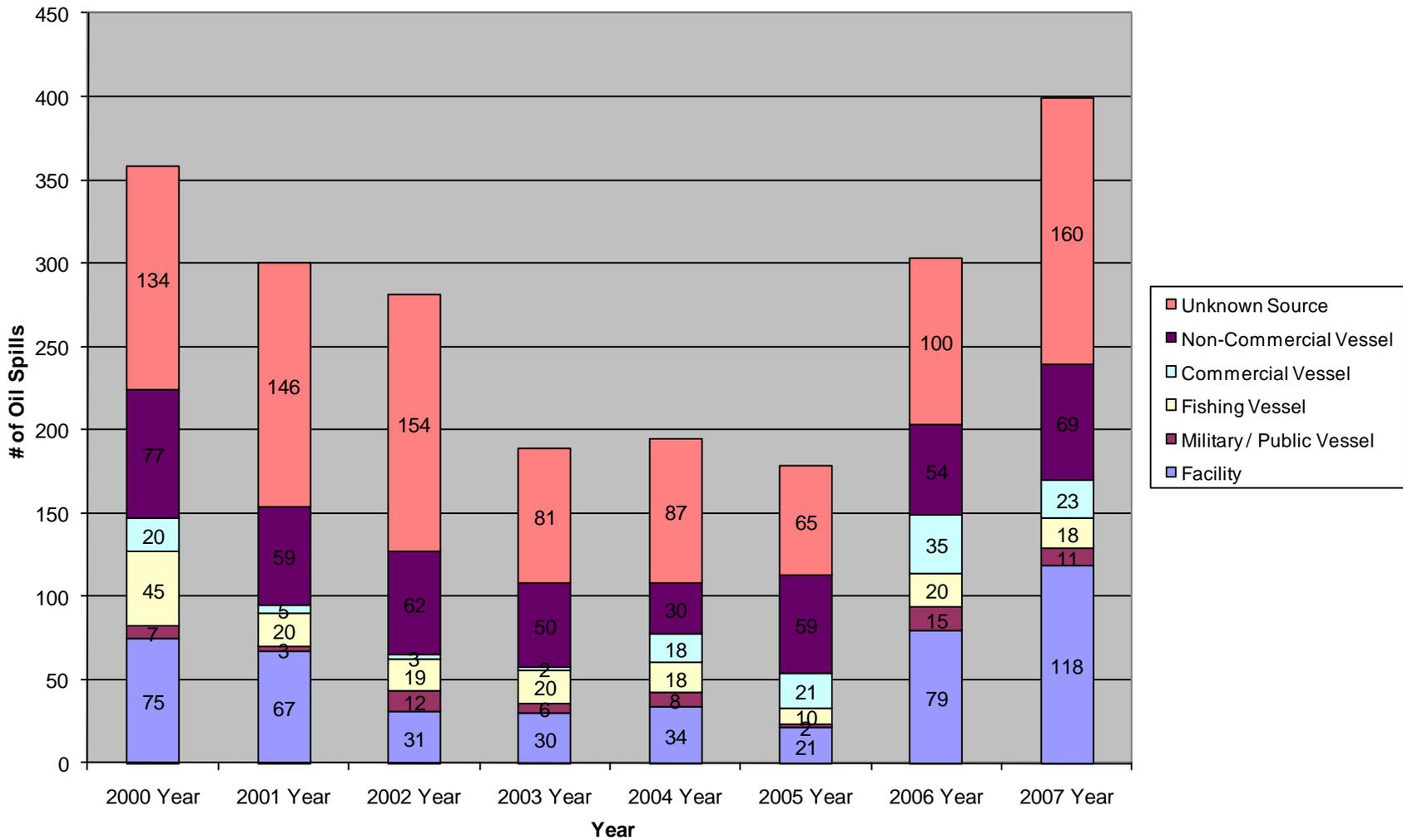
	01-12/31/2000	01-12/31/2001	01-12/31/2002	01-12/31/2003	01-12/31/2004	01-12/31/05	01-12/31/06	01-12/31/07	Totals	Average per year (2000-2007)
<b>Spill Source</b>	2000	2001	2002	2003	2004	2005	2006	2007	Totals	Average per year (2000-2007)
Facility / Non Vessel	75	67	31	30	34	21	79	118	321	64
Military/Public Vessel	7	3	12	6	8	2	15	11	39	8
Fishing Vessel	45	20	19	20	18	10	20	20	124	25
Commercial Vessel	20	5	3	2	18	21	35	30	60	12
Non-Commerical Vessel	77	59	62	50	30	59	54	71	319	64
Unknown Source	134	146	154	81	87	65	102	160	675	135

	2005	2006	2007	Totals	Avg per year (2005-2007)
<b>Total Reported Discharge Oil or Released Hazmat (gallons)</b>	14958	25090.00	60386.00	100434.00	50217

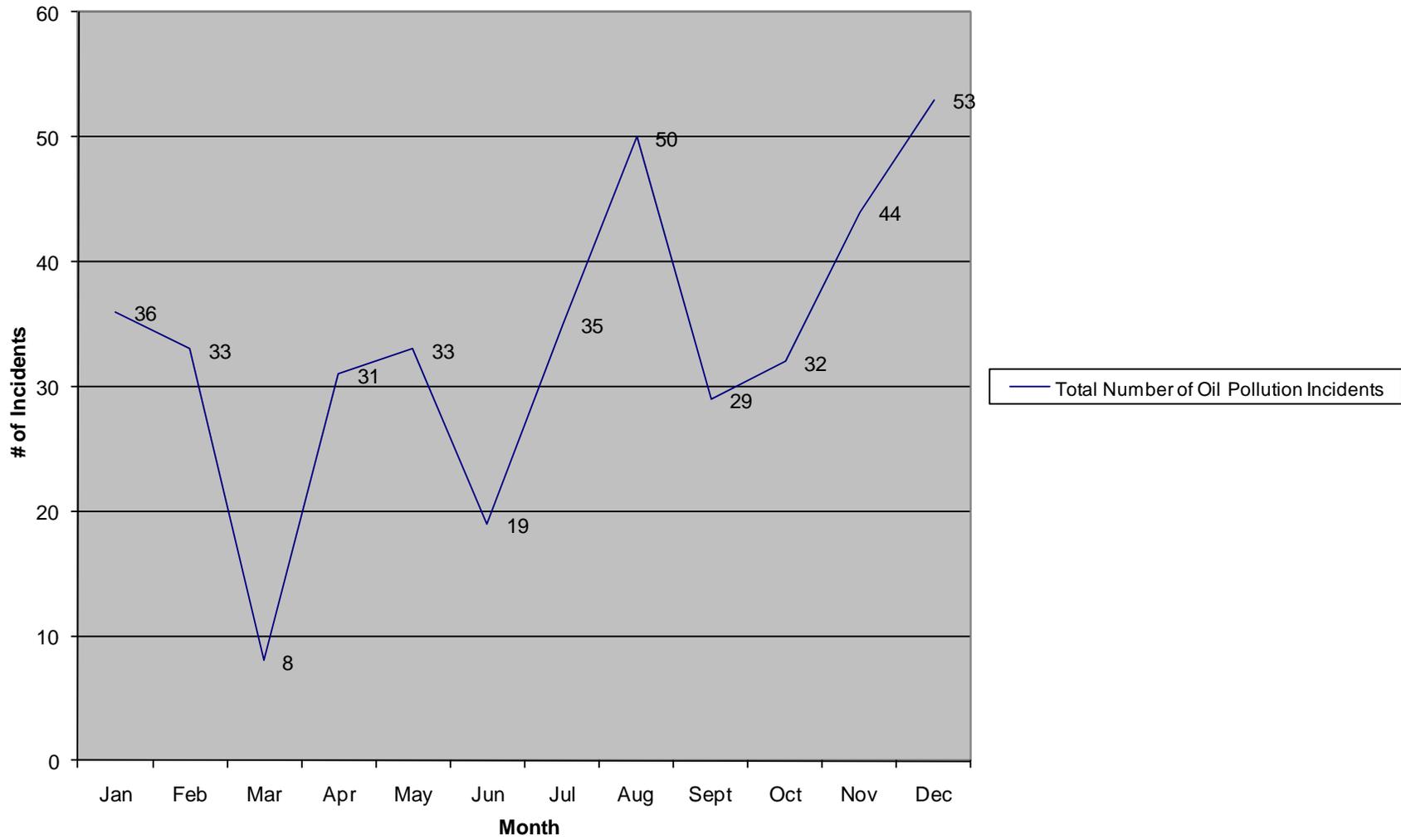
**Chart 1: Total Reported Oil Pollution Incidents for Sector San Francisco (2000-2007)**



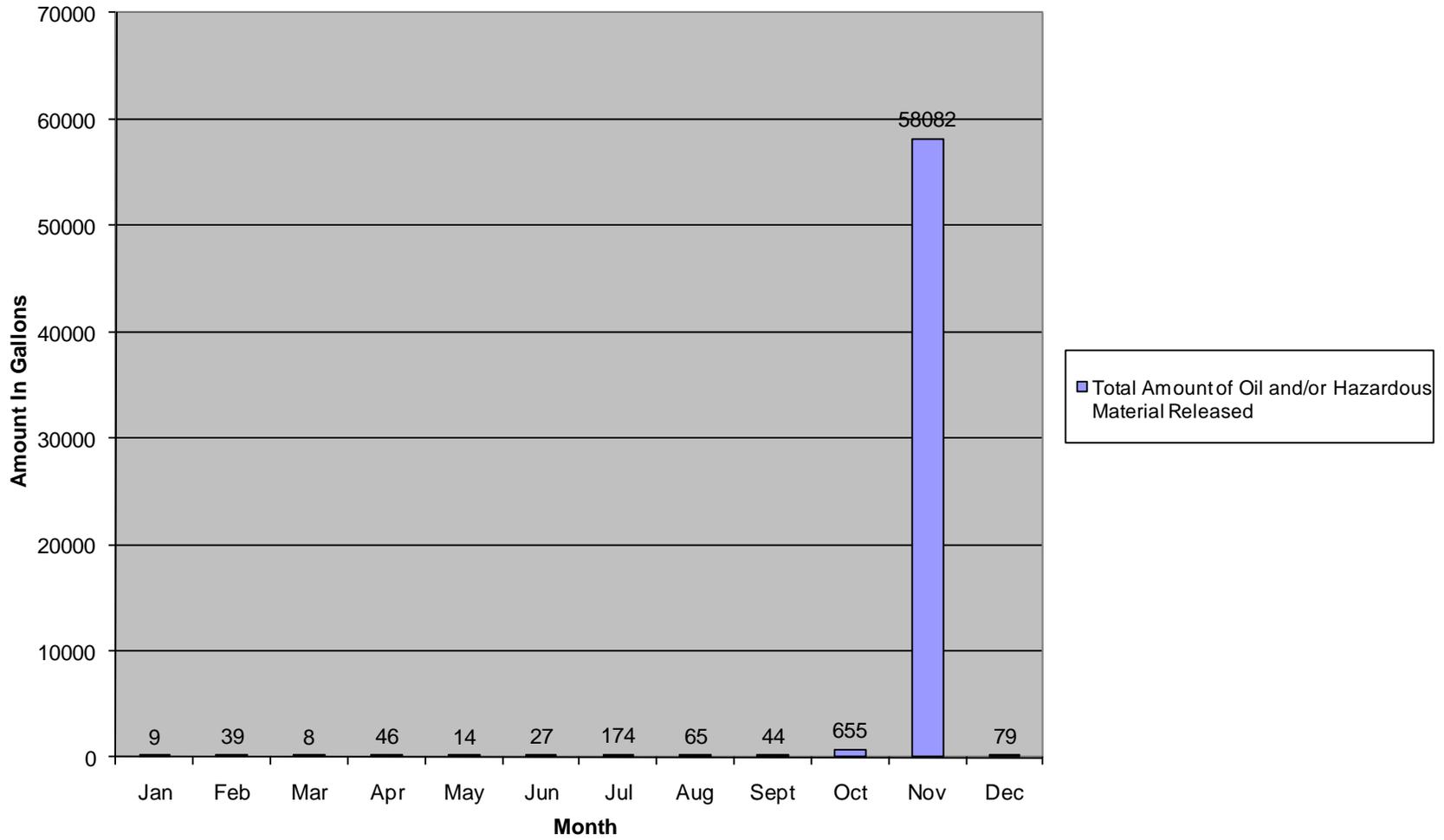
**Chart 2: Total Reported Oil Spills By Source (2000-2007)**



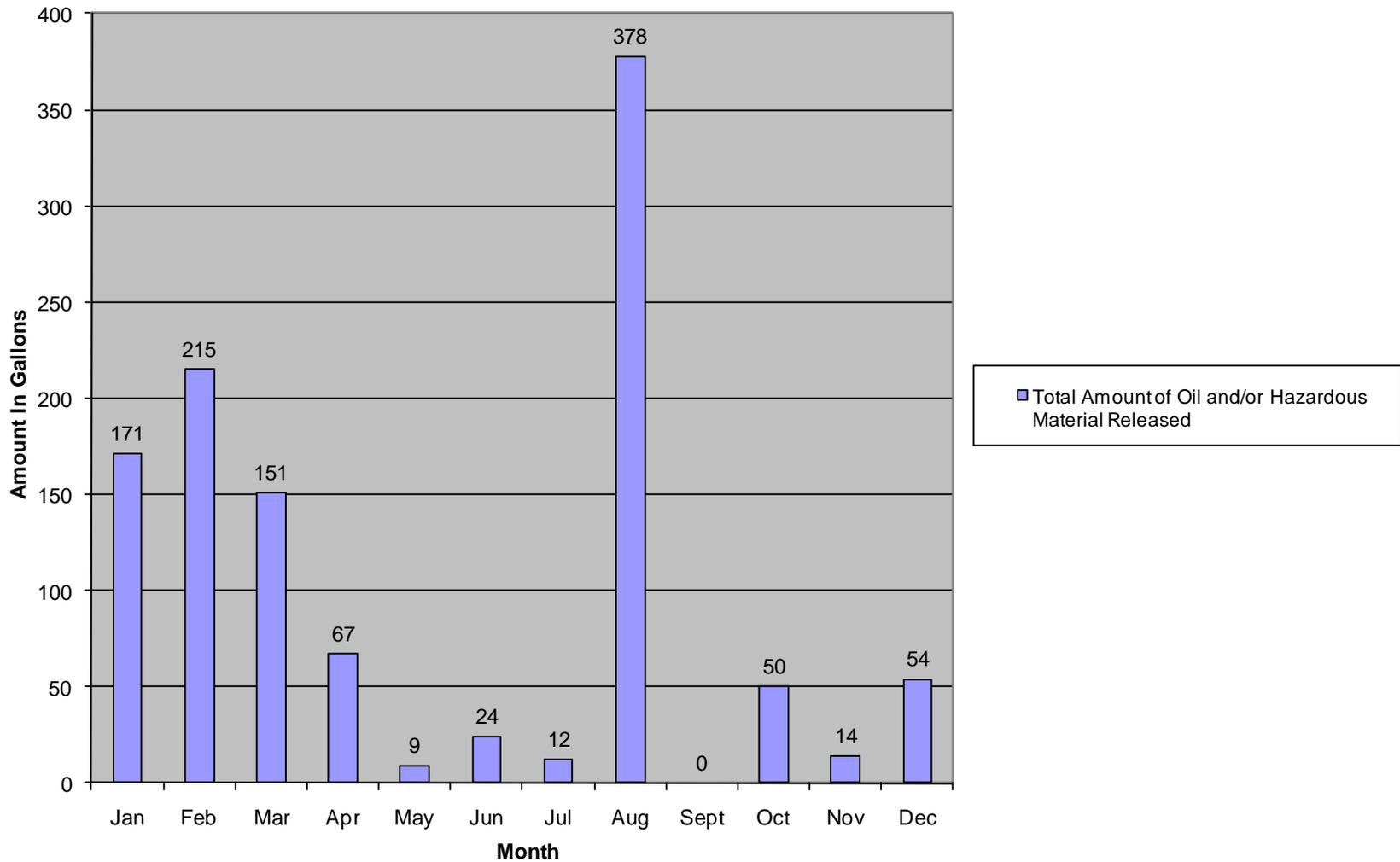
**Chart 3: Total Reported Oil Pollution Incidents/Month for 2007**



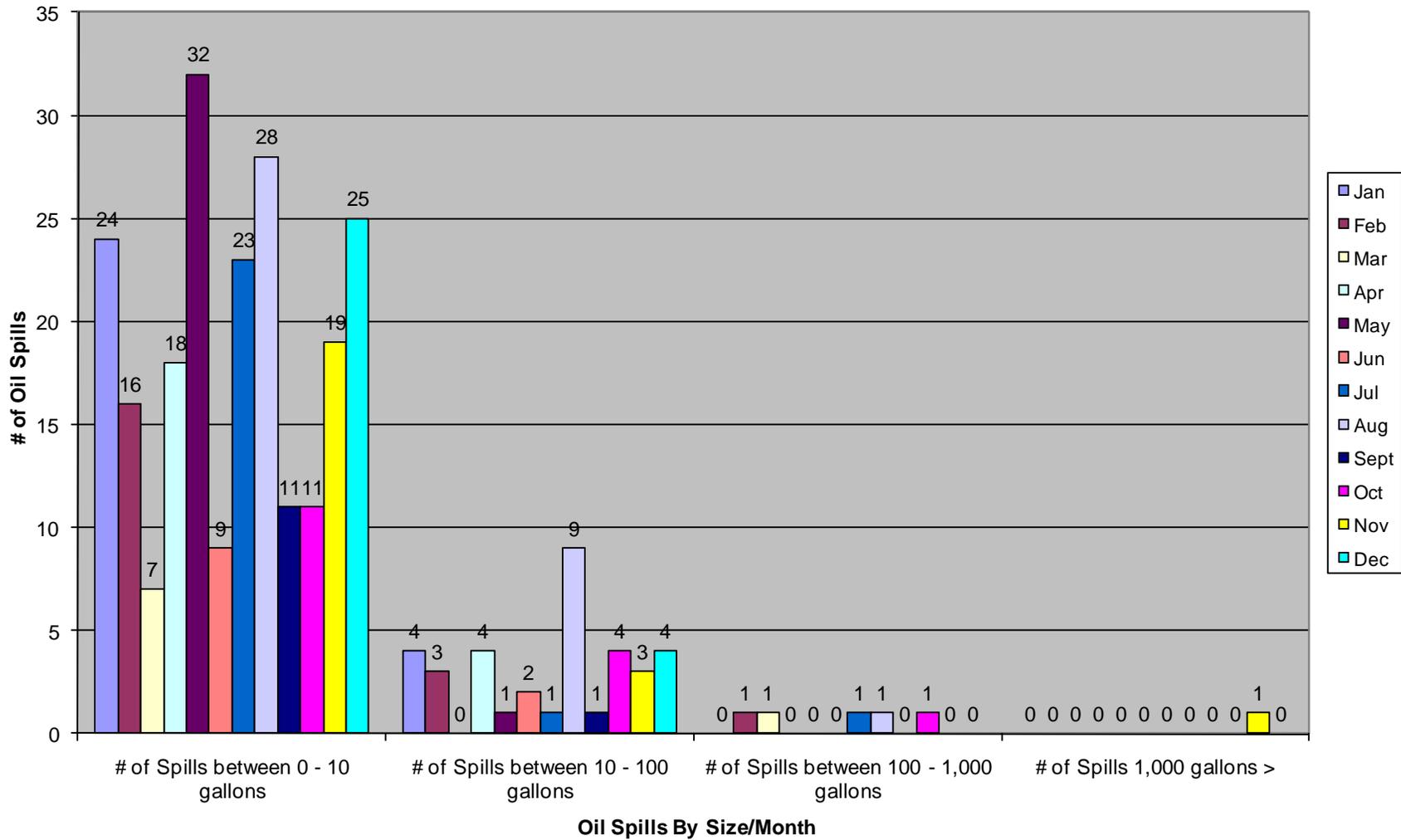
**Chart 4: Total Amount of Oil and/or Hazardous Material Released By Vessels/Month for 2007**



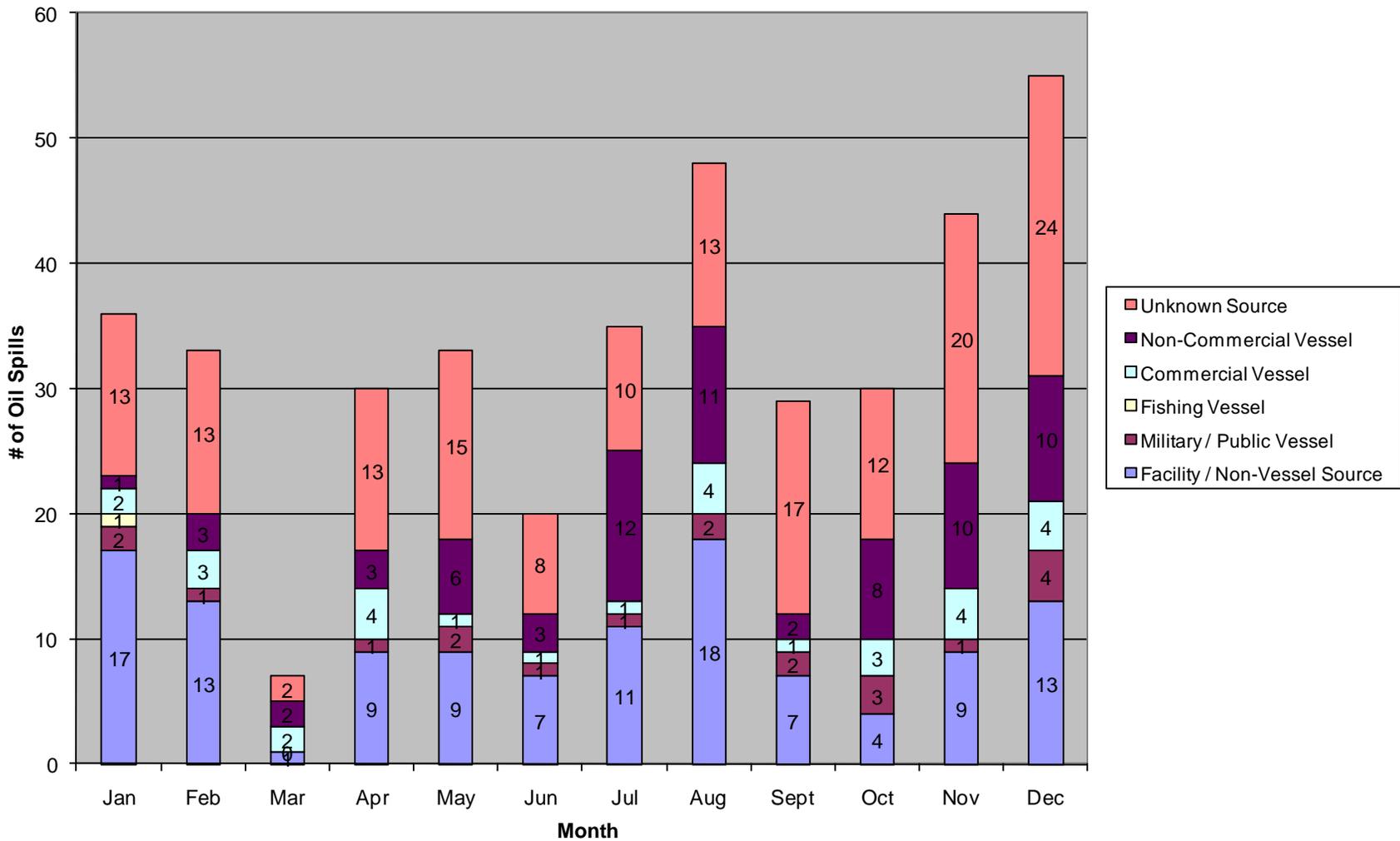
**Chart 5: Total Amount of Oil and/or Hazardous Material Released by Non-Vessels/Month for 2007**



**Chart 6: Total Reported Oil Spills By Size/Month for 2007**



**Chart 7: Total Reported Oil Spills By Source/Month for 2007**



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**Sector San Francisco Pollution Statistics January 1, 2008 to December 31, 2008**

**Total Reported Oil Pollution Incidents for Sector SF/Year - Chart 1**

	2000 Year	2001 Year	2002 Year	2003 Year	2004 Year	2005 Year	2006 Year	2007 Year	2008 Year	Total	Avg
Total Number of Oil Pollution Incidents	363	303	240	192	196	200	297	403	502	2696	299.56

**Total Reported Oil Spills By Source/Year - Chart 2**

	2000 Year	2001 Year	2002 Year	2003 Year	2004 Year	2005 Year	2006 Year	2007 Year	2008 Year	Total	Avg
Facility	75	67	31	30	34	21	79	118	145	600	66.67
Military / Public Vessel	7	3	12	6	8	2	15	11	29	93	10.33
Fishing Vessel	45	20	19	20	18	10	20	18	10	180	20.00
Commercial Vessel	20	5	3	2	18	21	35	23	29	156	17.33
Non-Commercial Vessel	77	59	62	50	30	59	54	69	74	534	59.33
Unknown Source	134	146	154	81	87	65	100	160	228	1155	128.33

**Total Reported Oil Pollution Incidents/Month for 2008 - Chart 3**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	Avg
Total Number of Oil Pollution Incidents	28	26	59	39	43	45	34	51	38	46	53	40	502	42

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	Avg
Total Amount of Oil Discharged and/or Hazardous Material Released (gallons)	258	90	335	67	3407	108	228	156	95	236	38	235	5253	438

**Total Amount of Oil and/or Hazardous Material Released by Vessels/Month for 2008 - Chart 4**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	Avg
Total Amount of Oil and/or Hazardous Material Released	28	20	12	1	62	8	25	35	95	183	5	83	556.5	46

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Total Amount of Oil and/or Hazardous Material Released by Non-Vessel Sources/Month for 2008 - Chart 5														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	Avg
Total Amount of Oil and/or Hazardous Material Released	230	70	323	66	3345	100	203	121	0	53	33	152	4696	391

Total Reported Oil Spills by Size/Month for 2008 - Chart 6														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	Avg
# of Spills between 0 - 10 gallons	4	11	22	7	28	6	7	13	5	11	8	5	127	11
# of Spills between 10 - 100 gallons	1	1	2	1	4	2	1	3	4	3	1	5	28	2
# of Spills between 100 - 1,000 gallons	1	0	2	0	0	0	0	0	0	1	0	0	4	0
# of Spills 1,000 gallons >	0	0	0	0	1	0	0	0	0	0	0	0	1	0

Total Reported Oil Spills By Source/Month for 2008 - Chart 7														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	Avg
Facility / Non-Vessel Source	8	4	18	11	15	13	10	16	6	14	12	18	145	12.08
Military / Public Vessel	1	0	0	0	0	4	2	3	0	3	2	0	15	1.25
Fishing Vessel	0	0	0	0	1	1	1	1	1	1	2	2	10	0.83
Commercial Vessel	0	0	4	2	4	0	5	2	6	3	1	2	29	2.42
Non-Commercial Vessel	9	2	4	3	12	8	4	7	6	7	8	4	74	6.17
Unknown Source	10	20	33	23	11	19	12	22	19	18	27	14	228	19.00

Penalty Action:														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	Avg
Civil Penalty (MV)	0	0	0	0	1	0	0	0	0	0	0	0	1	0.08333
Civil Penalty (TK)	2	1	2	3	0	0	2	2	2	4	0	1	19	1.58333
Letter of Warning (LOW)	1	1	5	3	4	3	3	2	3	3	3	3	34	2.83333

Please Note: Oil Discharge data includes all discharges within the USCG response zone, including wetlands and adjacent waterways.

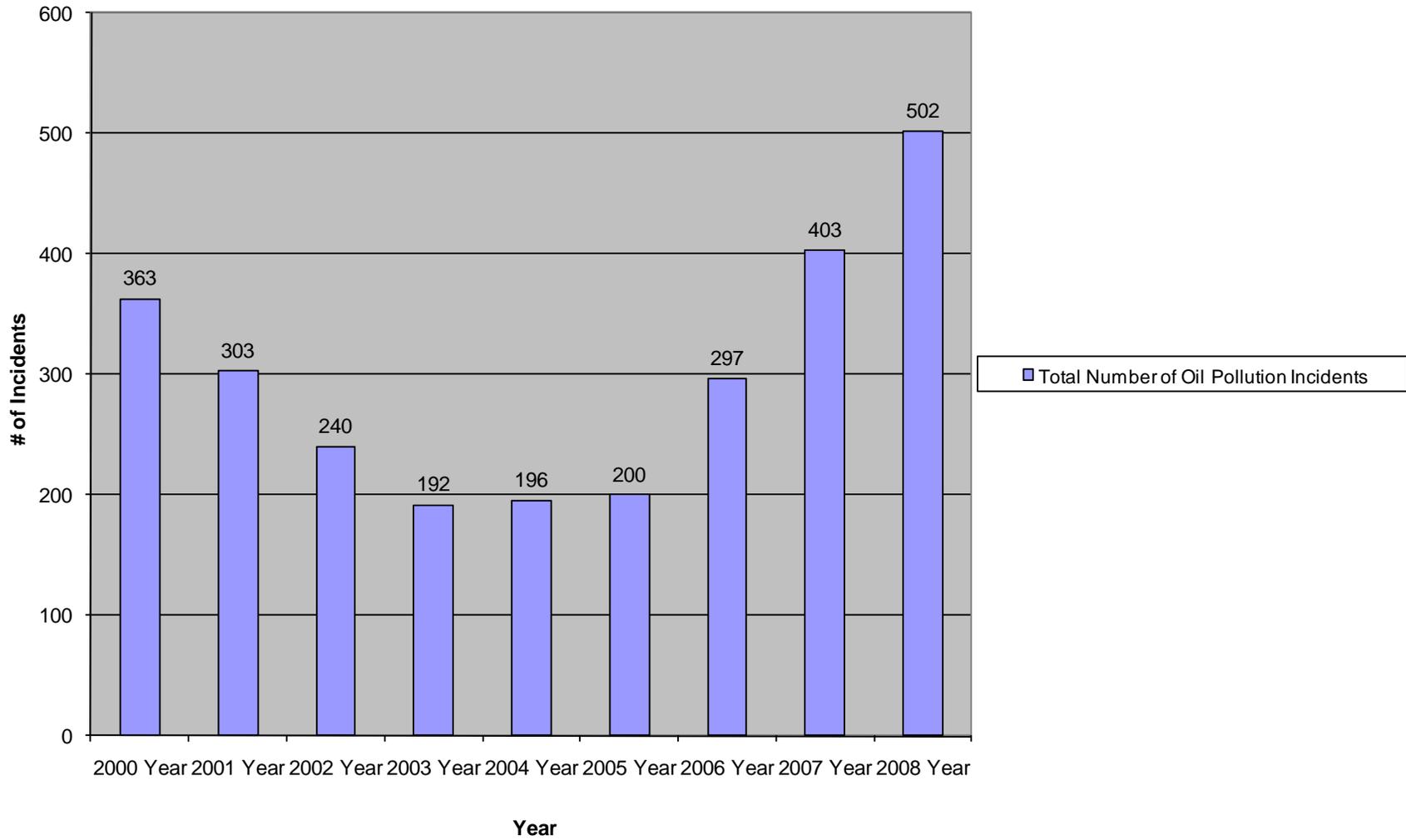
Appendix N

<b>Sector San Francisco Pollution Statistics: 2000 to 2008</b>											
	01-12/31/2000	01-12/31/2001	01-12/31/2002	01-12/31/2003	01-12/31/2004	01-12/31/2005	01-12/31/06	01-12/31/07			
	2000 Year	2001 Year	2002 Year	2003 Year	2004 Year	2005 Year	2006 Year	2007 Year	2008 Year	Totals	Average per year (2000-2007)
<b>Total Reported Oil Pollution Incidents for Sector SF</b>	363	303	240	192	196	249	297	403	502	2496	312
<b>Penalty Action:</b>											
Civil Penalty (MV)	11	10	41	18	4	1	1	5	1	90	13
Civil Penalty (TK)	30	18	41	25	9	23	18	18	19	159	23
Letter of Warning	75	45	52	31	40	39	46	35	34	324	46

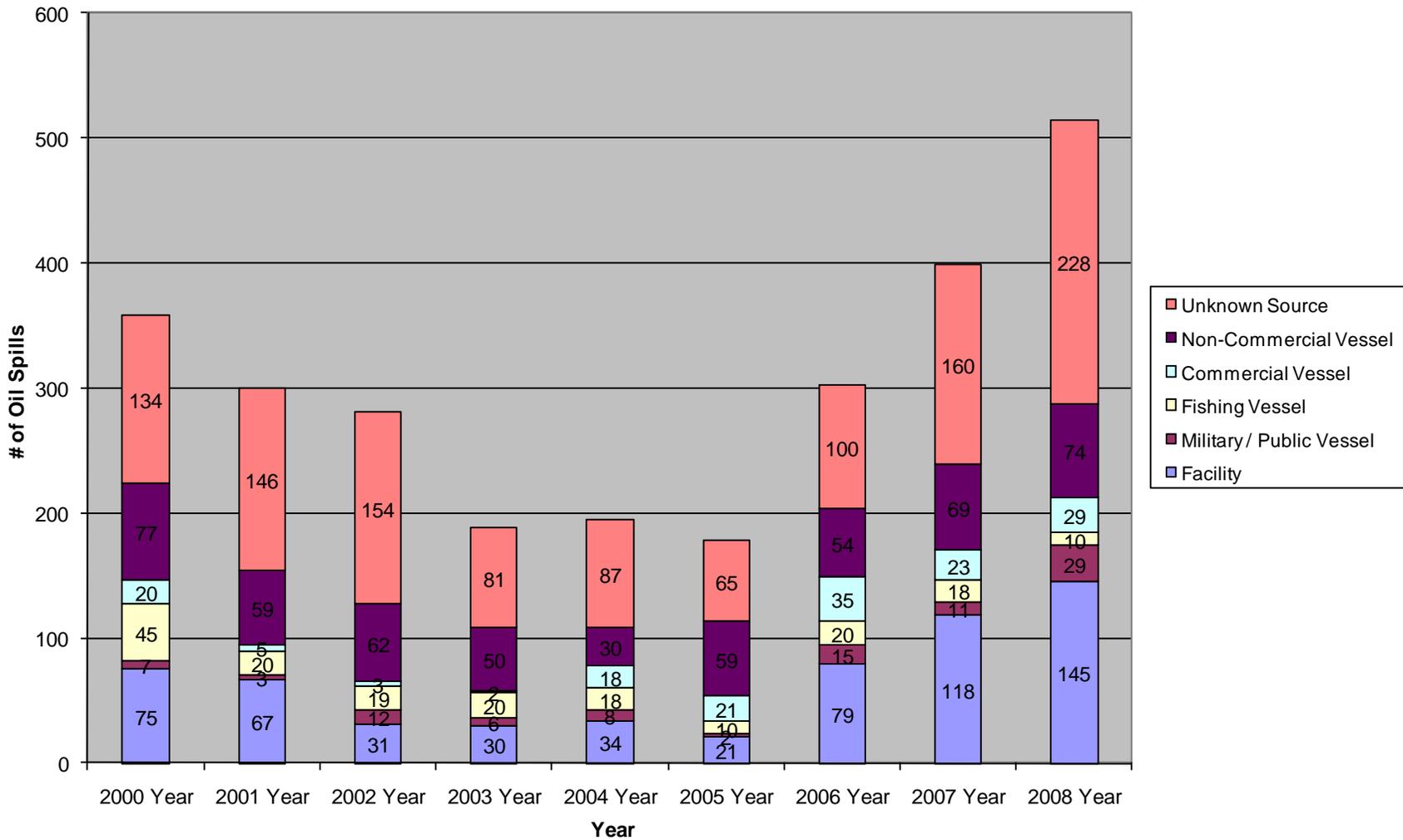
	01-12/31/2000	01-12/31/2001	01-12/31/2002	01-12/31/2003	01-12/31/2004	01-12/31/05	01-12/31/06	01-12/31/07			
<b>Spill Source</b>	2000	2001	2002	2003	2004	2005	2006	2007	2008	Totals	Average per year (2000-2007)
Facility / Non Vessel	75	67	31	30	34	21	79	118	145	321	64
Military/Public Vessel	7	3	12	6	8	2	15	11	15	39	8
Fishing Vessel	45	20	19	20	18	10	20	20	10	124	25
Commercial Vessel	20	5	3	2	18	21	35	30	29	60	12
Non-Commerical Vessel	77	59	62	50	30	59	54	71	74	319	64
Unknown Source	134	146	154	81	87	65	102	160	228	675	135

	2005	2006	2007	2008	Totals	Avg per year (2005-2008)
<b>Total Reported Discharge Oil or Released Hazmat (gallons)</b>	14958	25090.00	60386.00	5253.00	105687.00	42274.8

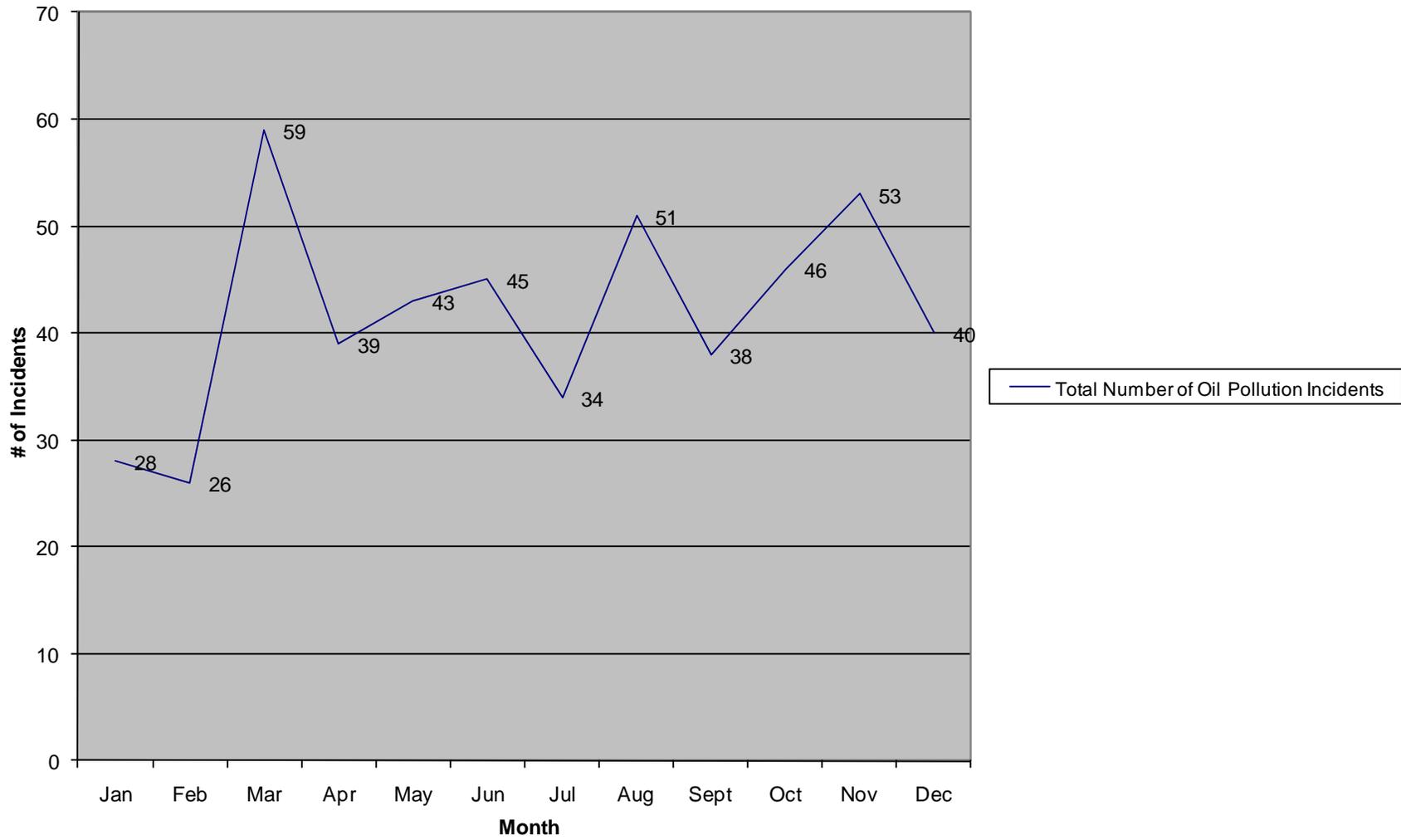
**Chart 1: Total Reported Oil Pollution Incidents for Sector San Francisco (2000-2008)**



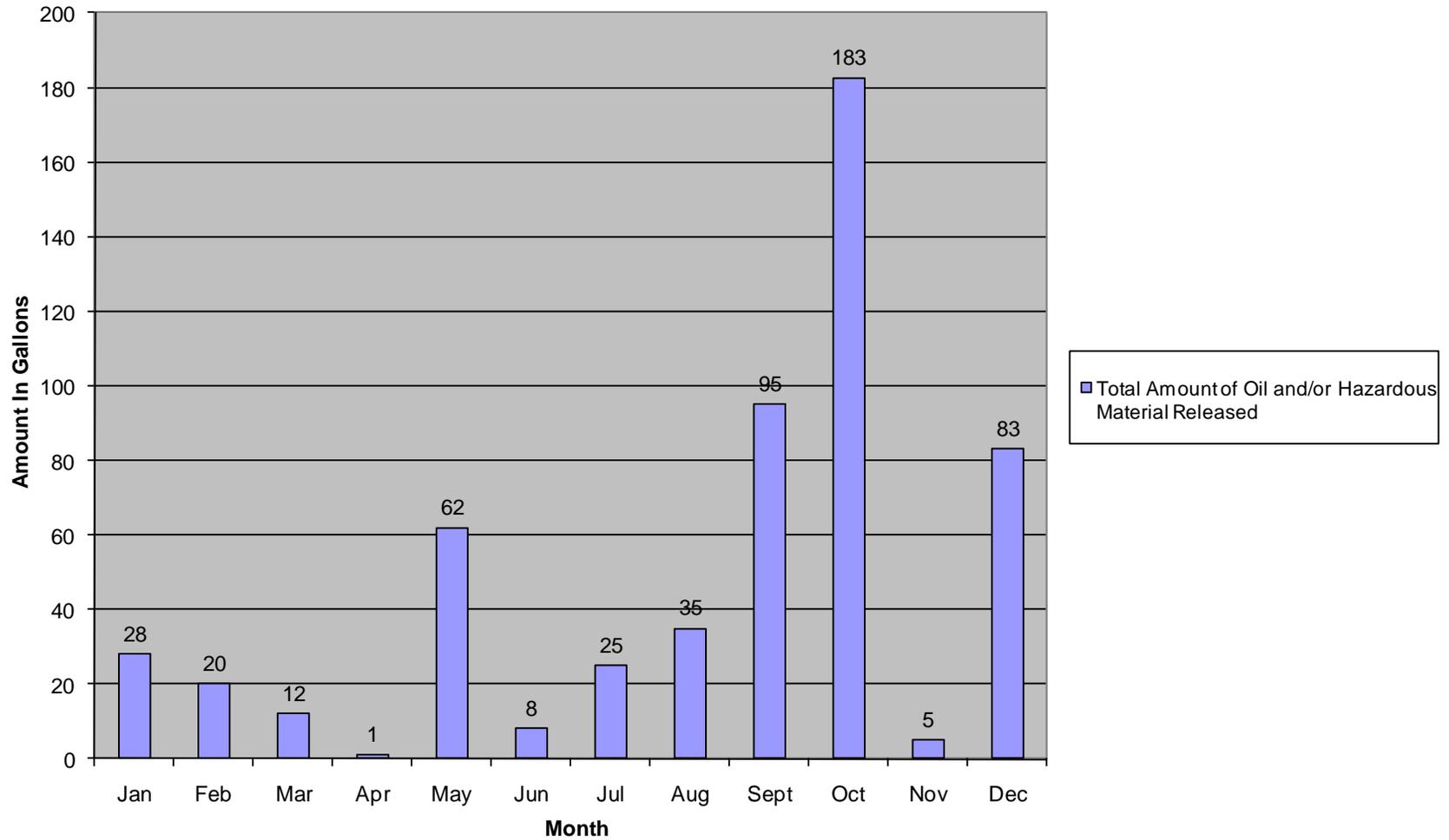
**Chart 2: Total Reported Oil Spills By Source (2000-2008)**



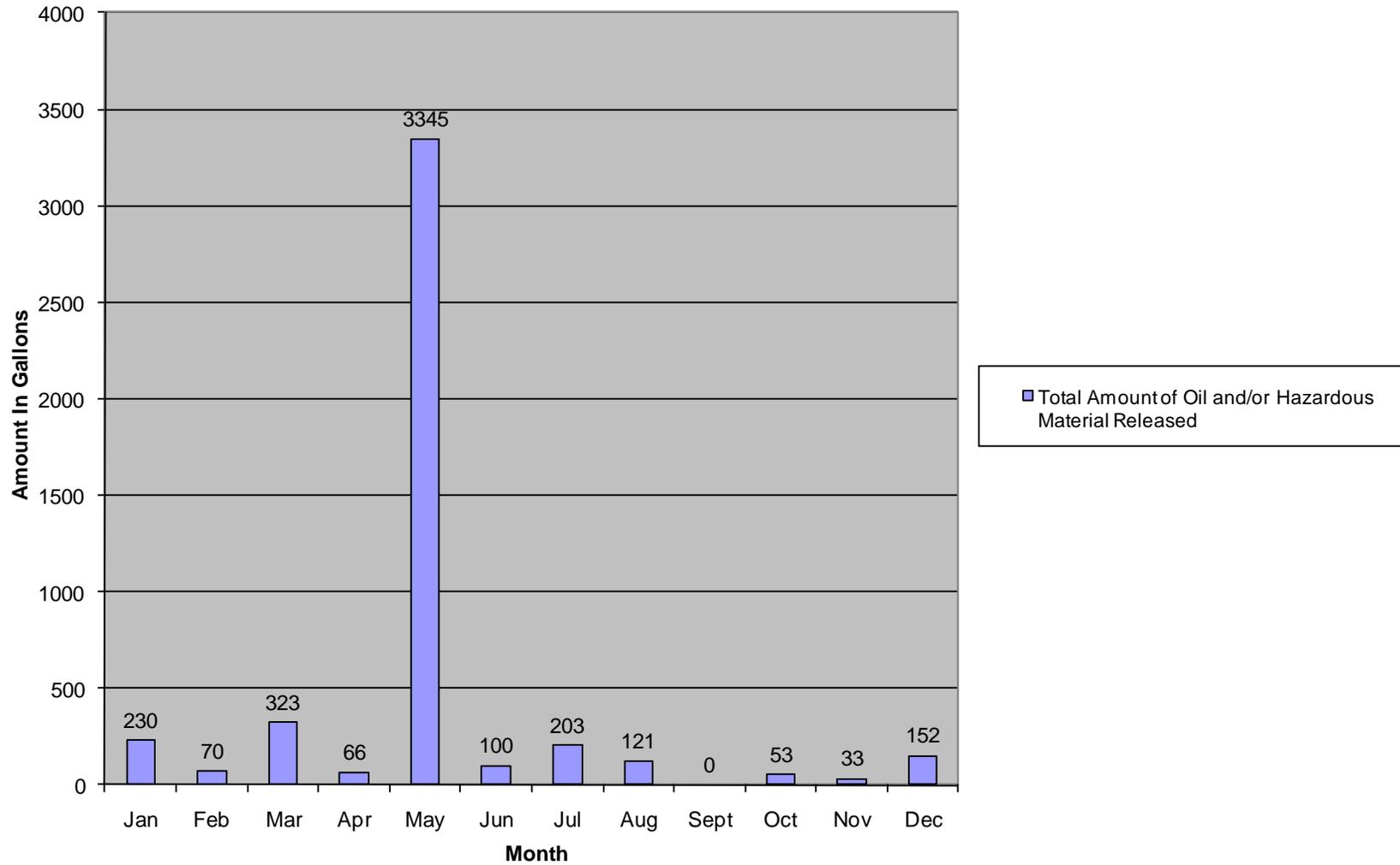
**Chart 3: Total Reported Oil Pollution Incidents/Month for 2008**



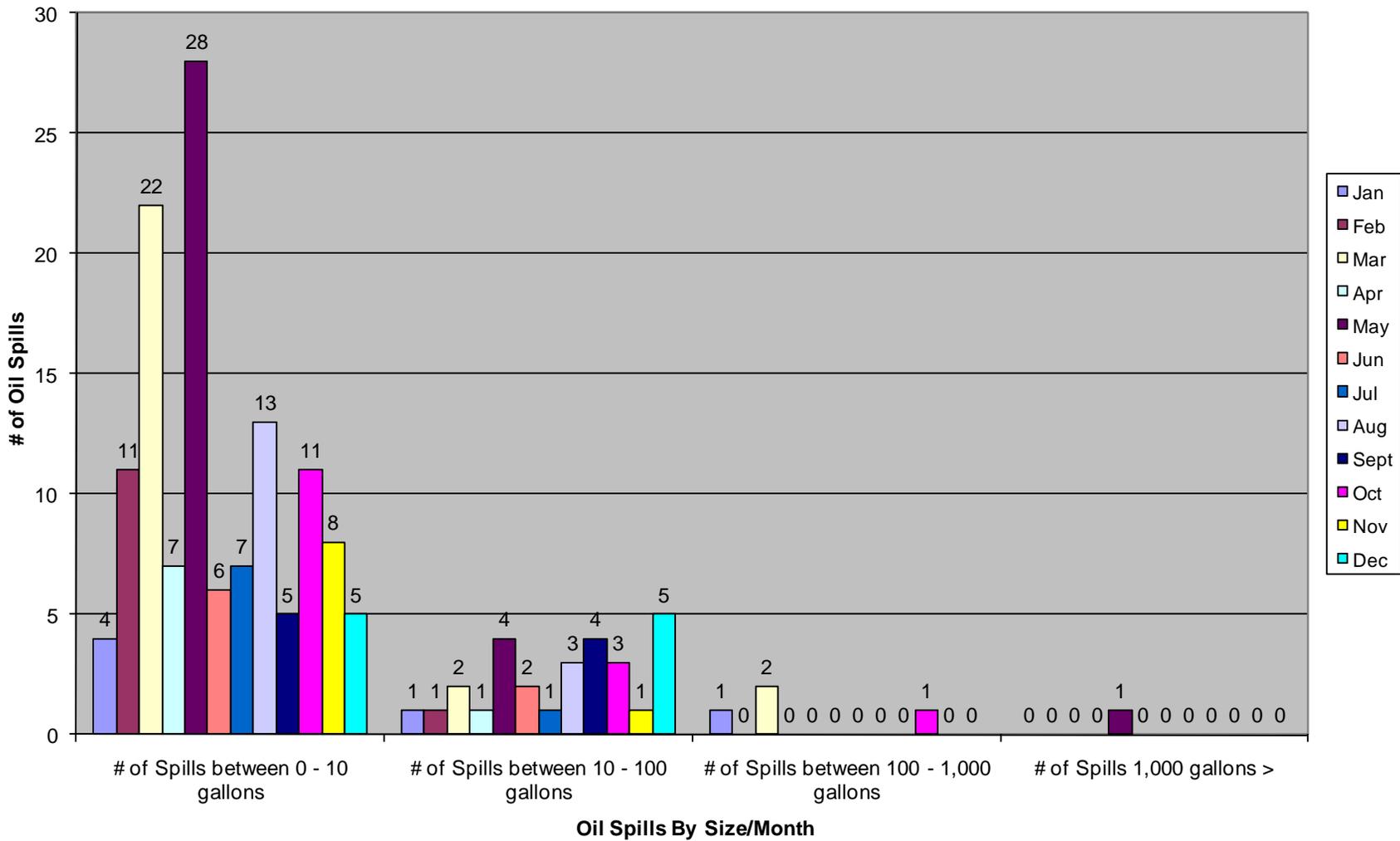
**Chart 4: Total Amount of Oil and/or Hazardous Material Released By Vessels/Month for 2008**



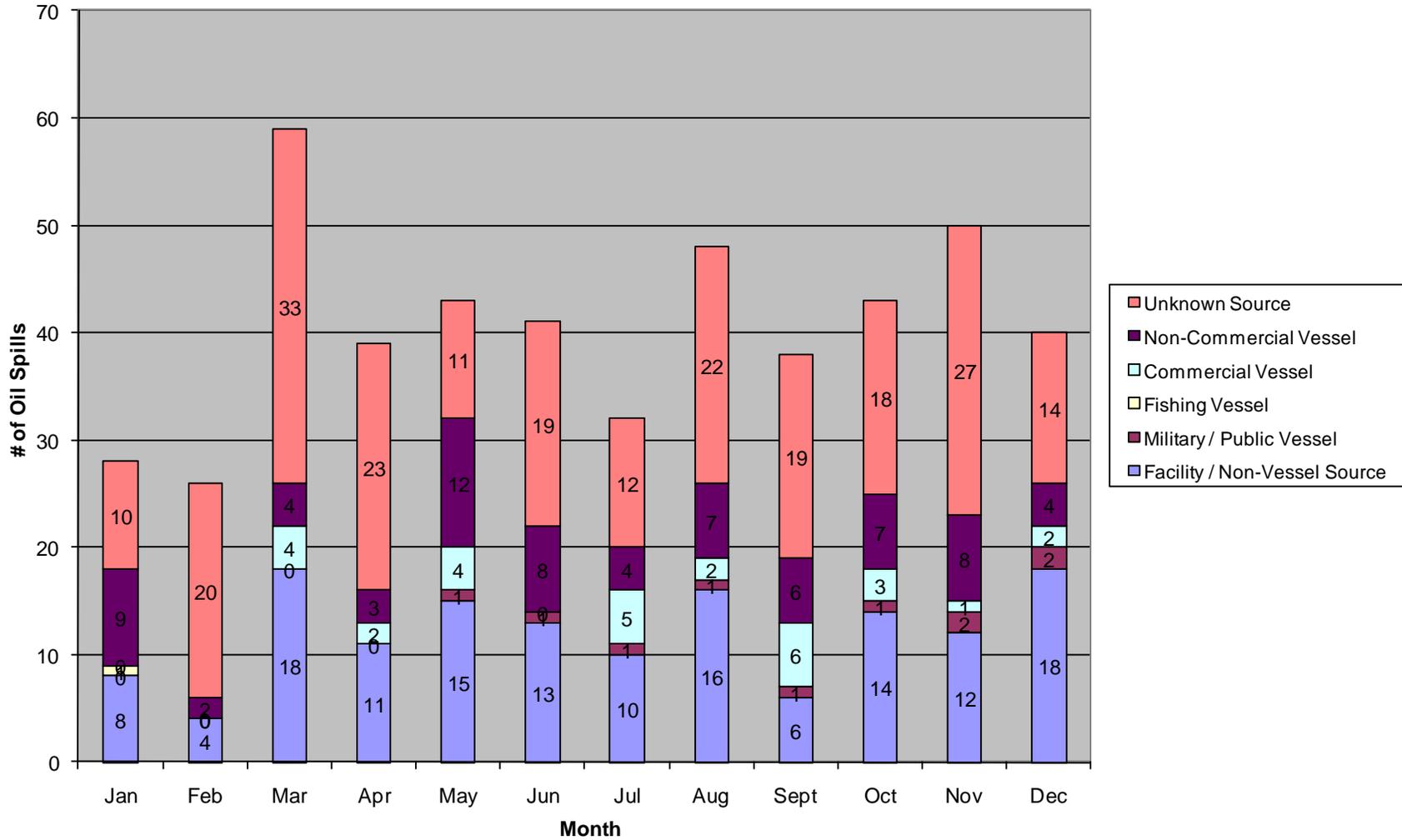
**Chart 5: Total Amount of Oil and/or Hazardous Material Released by Non-Vessels/Month for 2008**



**Chart 6: Total Reported Oil Spills By Size/Month for 2008**



**Chart 7: Total Reported Oil Spills By Source/Month for 2008**



**CALIFORNIA STATE LANDS COMMISSION  
SAN FRANCISCO REGION  
Waterborne Petroleum Cargo Statistics**

**January 1, 2007 – December 31, 2007**

<b>Product</b>	<b>Load (in barrels)</b>	<b>Discharge (in barrels)</b>
Additives - Alkylate	1,816,900	5,520,600
Additives - Naphtha	878,000	1,545,500
Additives - Other	1,670,300	3,857,100
Additives - Ethanol	180,000	0
Additives – Reformate	2,490,840	243,000
Additives – Toulene	251,000	58,000
Crude – ANS	1,015,000	42,865,000
Crude – Import	0	104,744,300
Crude – Other	41,000	2,270,000
Cutter Stock	1,311,500	208,500
Diesel	25,127,539	13,123,100
Fuel Oil	29,858,735	17,167,382
Gasoline	43,125,100	14,935,600
Jet Fuel	10,245,100	5,486,179
Light Cycle Oil	11,538,907	36,753,336
Lube Oil	4,414,615	323,800
MDO	6,390	52,000
Other	1,482,550	2,448,848
<b>Totals:</b>	<b>135,453,476</b>	<b>251,602,245</b>

**Total Loads: 135,453,476**

**Total Discharges: 251,602,245**

**Total # of barrels: 387,055,721**

**CALIFORNIA STATE LANDS COMMISSION  
SAN FRANCISCO REGION  
Waterborne Petroleum Cargo Statistics**

**January 1, 2008 – December 31, 2008**

<b>Product</b>	<b>Load (in barrels)</b>	<b>Discharge (in barrels)</b>
Additives - Alkylate	858,000	3,478,800
Additives - Naphtha	1,522,000	239,000
Additives - Other	1,109,200	2,160,000
Additives - Ethanol	0	38,000
Additives – Reformate	1,116,000	0
Additives – Toulene	37,000	150,000
Crude – ANS	0	40,661,000
Crude – Import	400,000	126,204,310
Crude – Other	0	964,000
Cutter Stock	297,500	733,714
Diesel	30,905,353	8,733,814
Fuel Oil	29,698,875	14,202,276
Gasoline	51,532,468	14,245,200
Jet Fuel	20,544,000	993,050
Light Cycle Oil	6,587,902	30,269,993
Lube Oil	6,054,282	229,555
MDO	1,300	0
Other	642,000	605,000
<b>Totals:</b>	<b>151,305,880</b>	<b>243,741,712</b>

**Total Loads: 151,305,880**

**Total Discharges: 243,741,712**

**Total # of barrels: 395,213,592**

## **RECOMMENDATIONS YET TO BE IMPLEMENTED**

**I. Geographical Boundaries** No current recommendation.

### **II. General Weather, Tides and Currents**

1. The Harbor Safety Committee supports efforts to adequately fund NOAA maritime functions. The Committee recommends that NOAA update tide and current data using the latest technology available and publish the water level and current atlases on an expeditious basis.

2. The Harbor Safety Committee urges that the OSPR Administrator continue to support PORTS as a high priority and that OSPR continue to seek and allocate funds to maintain the system. The Committee recommends that the Marine Exchange of the San Francisco Bay Region continue to operate, maintain and support the uses of the PORTS program.

3. The Harbor Safety Committee recommends that a statewide uniform system of PORTS, certified by NOAA, be established in California waters. PORTS should be permanently financed by the State of California and/or NOAA, as there is broad public benefit in terms of marine safety, protecting the environment, use by recreational boaters and by academia, and preventing oil spills in California waters. Safety of navigation in our harbors is highly dependent upon real time tidal, current and wind information. OSPR, as an agency, should continue its oversight role.

**III. Aids to Navigation** No current recommendation.

**IV. Anchorages** No current recommendation.

### **V. Surveys, Charts and Dredging**

1. The Committee continues to encourage facility owners/operators to conduct annual condition surveys of depths alongside and at the head of their facilities. The surveys should be forwarded to NOAA for application to the nautical charts.

2. The Committee continues to support the spirit of cooperation of the Corps of Engineers (COE) in providing timely up-to-date surveys of deep-water navigation channels, with highest priority on areas where shoaling has taken place, and timely dissemination of that information to the United States Coast Guard (USCG), pilots and the maritime community.

## Appendix P

3. The Committee continues to support NOAA's timely updating of charts to reflect survey information from NOAA, COE and independent sources, frequently publishing data on channel depths in areas heavily trafficked by deep draft vessels, oil tankers and barges, and quickly alerting the USCG, pilots and the maritime community.

### **VI. Contingency Routing**

1. The Committee continues to support the high degree of cooperation and consultation between pilots, the Coast Guard, the COE, port authorities and all other appropriate agencies and contractors, 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. The Committee continues to request that Caltrans, railroads, etc., provide notice of work that would temporarily or permanently reduce bridge clearances as far in advance as possible through the Local Notice to Mariners, at a minimum, to assure that vessels are alerted to these hazards.

### **VII. Vessel Speed and Traffic Patterns**

1. As larger and deeper draft vessels enter San Francisco Bay en route to the Port of Oakland due to the -50 foot deepening project, it is recommended that the Navigation Work Group of the Harbor Safety Committee (HSC) examine the current traffic scheme in the Bay and make recommendations to the Coast Guard for any changes in the current traffic schemes.

2. It is recommended that the Navigation Work Group (or a special group formed for this purpose) examine the Coast Guard's marine casualty statistics and their monthly reports of Significant Port Safety and Security cases to determine if there are trends or issues that should be brought to the HSC's attention for further consideration or action. A summary shall be included in the Annual Report to the Harbor Safety Committee.

**VIII. Accidents and Near-Accidents** No current recommendation.

**IX. Communication** No current recommendation.

### **X. Bridges**

1. The Harbor Safety Committee continues to recommend that Caltrans, the Golden Gate Bridge and other owners and bridge operators install energy-absorbing fendering, instead of wooden or plastic fendering as bridges are repaired, retrofitted or in new construction.

**XI. Small Passenger Vessels - Ferries** No current recommendation.

**XII. Small Vessels**

1. Representatives of the Harbor Safety Committee should continue to make efforts to meet with representatives of the San Francisco Boardsailing Association, kayak, outrigger and canoe groups to promote safer navigation in the Bay by discussing such issues as race schedules and locations (if applicable); Rule 9 requirements; characteristics of large vessels, fast ferries, and tug/barge operations, and possible education efforts such as posting signs at areas frequented by large numbers of boardsailors or paddlesports enthusiasts to warn of vessel traffic dangers.

Other possible efforts include:

- Cooperate with the Coast Guard Auxiliary, U.S. Power Squadrons and other educational organizations to emphasize boater safety education and to disseminate boater safety materials to recreational boaters.
- Target boat rental establishments for education of inexperienced boaters.
- Target marinas and boat ramps for education outreach.

**XIII. Vessel Traffic Service** No current recommendation.

**XIV. Tug Escort/Assist for Tank Vessels**

1. The HSC encourages the maritime industry to provide simulator training for tug personnel with pilot participation for emergency tug operations, based on local conditions. The training would improve communication between pilots and tug masters, offer in-house training to tug industry personnel, and provide valuable “lessons learned” for emergency situations in a controlled environment.

**XV. Pilotage**

1. Urge the Board of Pilot Commissioners, as a near-term priority, to work with the San Francisco Bar Pilots to incorporate in the Pilot training program enhanced training in advanced electronic navigation systems, providing exposure to a greater number of systems and variety of presentations.

## Appendix P

2. Support adoption by the Board of Pilot Commissioners of a regulation to require that pilots licensed by the Pilot Commission be equipped with, and trained in the use of, portable electronic navigation equipment, commonly known as Portable Pilot Units ("PPUs"). The regulation should require that pilots be equipped with PPUs at all times while piloting except when the pilot deems that embarking on or disembarking from a vessel while carrying a PPU may present an unacceptable safety hazard to the pilot or when circumstances would prevent its use.

Such PPUs shall, at a minimum, have the following capabilities:

- (a) Displaying approved electronic navigation charts (ENCs) issued by the cognizant U.S. government authority;
- (b) Displaying the vessel's position and heading on such ENCs to the accuracy required by the International Maritime Organization (IMO) for Automatic Identification Systems (AIS); and
- (c) Displaying other navigational information as provided through the vessel's AIS pilot plug.

**XVI. Underkeel Clearance** No current recommendation.

**XVII. Economic and Environmental Impacts** No current recommendation.

**XVIII. Plan Enforcement** No current recommendation.

**XIX. Substandard Vessel Inspection Program** No current recommendation.

