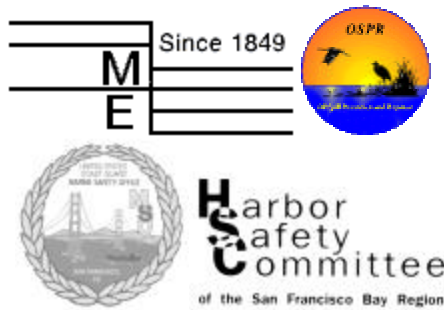


SAFE TRANSIT PROGRAM

Guide for Preventing Engine and Steering Failures

Standard of Care for San Francisco Bay



Sponsored by;

United States Coast Guard, MSO San Francisco

Office of Spill Prevention and Response

- **Harbor Safety Committee of the San Francisco Bay
Region**

Marine Exchange of the San Francisco Bay Region

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The Vessel “Safe Transit” Program

Purpose: The “Safe Transit” Program is an initiative designed to lower the risk of propulsion and steering casualties occurring in large vessels transiting the waters of San Francisco Bay. The program will consist primarily of two components: 1) a voluntary standard of care that will highlight the importance of proper maintenance and precautionary testing for shipboard control systems, 2) an increased effort to provide oversight by various agencies. The standard of care draws from elements of existing safety management programs, regulatory requirements and locally generated measures to establish good marine practice for preventing propulsion and steering casualties. The Coast Guard hopes that, by promulgating this program with the cooperation of the maritime community, the number of main propulsion and steering casualties will be reduced, thereby ensuring the safe transit of all vessels piloting the waters of San Francisco Bay.

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1. Required Tests and Drills Under U.S. & International Law

- ⇒ The following systems must be tested no more than 12 hours prior entering the navigable waterways of the United States and prior to getting underway:
 - ✓ Main engine machinery, ahead and astern, including telegraph.
 - ☑ Primary and secondary steering gear, includes a visual inspection of the steering gear and its connecting linkage, and where applicable, operation of the following:
 - ✓ Each remote steering gear control system. Each steering position located on the navigating bridge.
 - ✓ The main steering gear from the alternative power supply, if installed.
 - ✓ Each rudder angle indicator in relation to the actual position of the rudder.
 - ✓ Each remote steering gear control system power failure alarm.
 - ✓ The full movement of the rudder to the required capabilities of the steering gear.
 - ☑ All internal vessel control communications and vessel control alarms.
 - ☑ Standby or emergency generator, for as long as necessary to show proper functioning, including steady state temperature and pressure readings.
 - ☑ Storage batteries for emergency lighting and power systems in vessel control and propulsion machinery spaces.
- ⇒ The following steering drills must be completed within 48 hours of entering the navigable waters of the US or if conducted on a regular basis may be once every three months:
 - ☑ Operation of the main steering gear from within the steering gear compartment.
 - ☑ Operation of the means of communications between the navigating bridge and the steering compartment.
 - ☑ Operation of the alternative power supply for the steering gear if the vessel is so equipped.
- ⇒ Has the vessel's owners/operators, Port State Control Authority (USCG) and the classification society been contacted about all known non-compliance with regulatory or classification requirements?
- ⇒ These steering tests and other tests required by 33 CFR 165.25 must be completed and properly recorded in the vessels logbook.

2. Standard of Care Core Safety Components

The following maintenance/operational items should receive increased attention by owners and/or operators of ships bound for the San Francisco Bay:

a. STARTING AND CONTROL AIR SYSTEMS

1. Are air filters cleaned and replaced regularly, per manufacturer's guidelines? Are there adequate replacement filters onboard?
2. Are there procedures to ensure the control system is maintained per manufacturer's guidelines?
3. Are control air lines blown down regularly to remove moisture?
4. Are starting and control air lines leak free?
5. Are air tanks routinely inspected and cleaned?
6. Are all air receivers fully charged and drained of water prior to arrival?
7. Are air receivers kept charged during transit within the Bay?
8. Are air compressors checked for proper operation?
9. Are starting air system and components maintained and operated per manufacturer's guidelines?
11. Are air dryers used in the control air systems?
12. Are procedures in place to ensure maintenance on the starting or control air systems is ***not conducted*** while the vessel is operating in piloting waters?

b. FUEL SYSTEMS

1. Is fuel piping leak free, properly secured and insulated as necessary?
2. Are fuel heating and/or viscosity control systems checked routinely for proper operation?
3. Are fuel system valves properly labeled and operable?
4. Are fuel separators/filters cleaned/changed at an adequate interval?
5. Are fuel filters and strainers cleaned regularly? Are adequate spare filters available on board?
6. Are fuel change-over procedures consistent with the engine manufacturer's recommendations?
7. If necessary, is the fuel change-over completed prior to arriving at the sea buoy?

c. STEERING SYSTEMS

A scheduled maintenance/inspection program should be in place for the primary and secondary steering gear, including:

- a. Are linkages and control arms secure, double nutted, cotter pinned or lock wired to prevent loosening and potential loss of steering control?
- b. Are hoses, piping and fittings checked for signs of excessive wear or leaks?
- c. Are fluid levels checked, and if low refilled according to manufacturers specifications?
- d. Are the tools necessary for configuring the emergency operation of the primary and secondary steering gear checked and available in the steering gear room?
- e. Are the instructions for the proper operation of the steering gear posted in the pilot house and steering gear room in the language(s) that the responsible crew understand?
- f. Is there a block diagram of the steering system posted in the pilot house and steering gear room?
- g. Are all moving parts observed for signs of binding or excessive play?

d. SAFETY MANAGEMENT/HUMAN FACTORS

1. Do shipboard procedures identify the crew's duties and responsibilities for:
 - a. operating the engine system while navigating in piloting waters?
 - b. responding to engine emergencies, steering gear failures, and electrical system failures?
 - c. performing emergency anchor release?
2. Is the crew trained and regularly drilled in these procedures?
3. Do shipboard procedures address manning of unattended machinery spaces while maneuvering?
4. Is a senior licensed engineering officer in the engine control room while the vessel is in piloting waters?
5. Are all standby pumps (including cooling water, jacket water, lube oil, fuel oil, etc.) in working order and ready for immediate service when entering the Bay?
6. Are local/remote engine control stations examined for proper operation prior to entry into the Bay?
7. Are voice communications between the bridge and engine control station, emergency steering station, and anchor control stations adequate to handle emergencies?
8. Are up-to-date manufacturer's technical publications/reference materials onboard sufficient to perform routine preventative maintenance?
9. Is there sufficient equipment aboard the vessel to complete routine preventative maintenance and repair of high failure rate items?
10. Are oncoming pilots advised of all the items concerning the status of key navigation, propulsion and safety systems which could affect the safety of the proposed voyage?
11. Are oncoming watchstanders and joining crews adequately advised of all items concerning the status of key navigation, propulsion, and safety systems relevant to their respective positions?
12. Is care taken in the change out of a large portion of the ship's compliment to ensure an adequate transfer of information takes place?

3. BACKGROUND AND DISCUSSION

a. Background: Since the mid 1990's, the number of propulsion casualties experienced within the San Francisco Bay area has been on the rise. In the last four years, the number of propulsion casualties has steadily increased as follows: 21 in 1996; 28 in 1997; 38 in 1998; 35 in 1999; and 44 in 2000. A significant percentage of these casualties can be attributed to vessels with direct-drive diesel propulsion plants, and most have occurred during transition periods in a vessel's transit. These transition periods typically involve a reduction in speed where a stop or backing bell is ordered. For example; when picking up a pilot, the vessel has to reduce speed often below the vessel's slow ahead bell, which is typically accomplished by ordering a stop bell to further slow the vessel. Once the pilot is safely aboard, an ahead bell is re-ordered, which on occasion is unable to be answered. Most of these casualties can be attributed to improper maintenance of the involved shipboard systems. Additionally, it appears that the required precautionary testing of the propulsion and steering systems prior to entry into port may not be occurring.

b. Discussion: This document establishes recommendations for a voluntary standard of care designed to address two critical areas necessary for the prevention of propulsion and steering casualties: the maintenance and operational testing of important shipboard control systems. It also lays the groundwork for an initiative to increase oversight by regulatory agencies and other organizations responsible for ensuring maritime safety.

A review of recent casualty data has shown that many propulsion casualties have resulted from start/control air system failures, exhaust/intake system failures, and fuel system failures. In nearly all cases, the classification societies identified improper maintenance as either the root cause or a contributing factor. Specifically:

- Casualties relating to the start/control air system included clogged air filters, worn reversing disks, and inoperative start air valves.

b. Discussion continued...

- Casualties relating to the exhaust/intake system included fouled turbo charger grids, inoperative exhaust valves, and faulty gaskets.
- Casualties relating to the fuel system included fuel injector failures, dirty fuel strainers, and leaking main engine fuel lines.

To a large extent, these types of casualties can be prevented by increased vigilance in shipboard maintenance programs. Most vessels (tankers and certain bulk carriers) currently have developed safety management systems, in compliance with the International Safety Management Code (ISM), that encompass the maintenance procedures for these systems. All remaining vessels must have similar safety management systems in place by February 2002. This standard of care attempts to draw upon the elements within these safety management systems, and highlights the areas that are important to preventing control casualties. The owners/operators of ships should take action to ensure that their safety management systems adequately address these items, and that their accepted maintenance procedures are in agreement with all associated manufacturer's recommendations. Similarly, owner/operators should step up their vigilance to ensure that their safety management systems are properly implemented, especially with respect to the items contained herein.

c. Efforts to Increase Surveillance, Oversight, & Enforcement:

The goal of this program is to establish a standard of care that represents good marine practice. As such, it is our desire that the marine industry will voluntarily adopt the recommendations within their safety management systems and hold themselves accountable for responsible implementation. We recognize, however, that economic pressures often provide powerful incentives for some operators to put off needed preventative maintenance and neglect their safety management systems. As a counter balance, the Coast Guard proposes to implement an initiative that will focus increased attention and oversight (by regulatory bodies) on the maritime communities efforts to implement the core elements of this standard of care. Oversight actions should assist maritime companies in determining where shortfalls exist in their safety management systems. Oversight efforts may take the form of enforcement action where necessary when shipboard conditions do not meet required minimum safety standards set by US and International laws and regulations.

Vessel boarding crews will conduct material inspections of involved systems and record checks for maintenance/testing procedures on vessels during annual port state control exams, US vessel inspections, and during investigations of loss of propulsion and steering casualties. The purpose of these boardings will be assess the vessel's adherence to the recommendations contained within the standard of care, and to ensure compliance with the minimum requirements of related laws and regulations. Boarding teams will typically consist of Coast Guard personnel, but may also include personnel from classification societies, state agencies, etc.

USCG investigative boardings, in response to a loss of propulsion or a steering casualty, will determine the cause of the failure, ensure the system is returned to working order, and assess the related Safety Management System. The results of USCG inspection and casualty investigation reports are public information. This information provides the general public with important safety information which can aid them in making decisions regarding the carriers they may charter to carry cargo into the San Francisco Bay area. Public access to such records provides a direct economic incentive for carriers to increase their conscious efforts to implement their safety management systems and prevent shipboard system casualties.

4. RESOURCES

a) Document References

- i. "Guide for Preventing Engine and Steering Failures",
MSO/ISP/VBB/FORM 2, U.S.C.G. MSO & San Francisco
Bay Area Classification Societies, Alameda [March 1998]
- ii. 33 CFR 164 & 46 CFR 4.05-5

b) Contacts

- i. **U.S.C.G. MSO SAN FRANCISCO**
Bldg. 14 Coast Guard Island
Alameda, Ca 94501
24 hr 510 437-3073
Fax 510 437-3072
Web: www.uscg.mil/d11/msosf/
 - ii. **Office of Spill Prevention and Response**
1416 Ninth Street
P.O. Box 944209
Sacramento, CA 94244-2090
Department of Fish and Game, State of California
24 hr Dispatch 916 445-0045
Spill Report OES 800 852-7550
email: rhughes@Ospr.dfg.ca.gov
 - iii. **Marine Exchange of the San Francisco Bay Region**
Fort Mason Center, Building "B"
Suite 325
San Francisco, CA 94123-1380
24 hr 415 441-6600
Fax 415 441-3080
Email: info@sfmtx.org
Web: www.sfmtx.org
 - iv. **Harbor Safety Committee**
Meetings on the 2nd Thursday of each month.
All communications can be directed toward the Marine
Exchange of San Francisco Bay
- c) **Sources for Additional Pamphlets**
- i. **Marine Exchange of the San Francisco Bay Region.**
 - ii. **USCG, MSO San Francisco**