

NAVIGATION WORK GROUP

From: Bruce Horton, Work Group Chair
Subject: Work Group Recommendation on Crew Staffing Requirements
Date: May 8, 2008

Introduction

In response to the Cosco Busan oil spill incident, Governor Schwarzenegger directed a state investigation into the causes of and response to the oil spill. The directive outlined a number of issues to ensure “any action necessary to prevent this from ever happening again.” OSPR tasked the Harbor Safety Committee (HSC) of the San Francisco Bay Region to “analyze the navigational safety-related issues of the Governor’s directive and make appropriate recommendations regarding the prevention aspects of the incident.”

The HSC Work Groups addressed the issues raised in the Governor’s directives based on information available, noting that the National Transportation Safety Board (NTSB) report on the cause is not expected to be completed until autumn 2008, and the State Board of Pilot Commissioners Accusation (Case No. 07-01) of the pilot is scheduled for hearing before an Administrative Law Judge beginning September 2, 2008. Other investigations are focused on oil spill response efforts.

The Navigation Work Group met March 4 and April 18, 2008, to consider the question of vessel crew staffing requirements in reduced visibility in the San Francisco Bay Region.

Note: the following findings and recommendations should be considered preliminary, as not all evidence was accessible. As new information becomes available, the Harbor Safety Committee may revisit or address other policy implications.

Existing Crew Staffing Requirements in Reduced Visibility

The Work Group reviewed the following regulations and guidelines regarding requirements for crew staffing on large vessels in restricted visibility. (Attached as an addendum.)

1. Selected COLREGS including Rule 5 Lookouts, Rule 6 Safe Speed, and Rule 19 Conduct of Vessels in Reduced Visibility.
2. 46 CFR 15.705 addressing manning requirements for watches on U.S. vessels.
3. Seafarer's Training, Certification & Watchkeeping (STCW) Code, A-VIII/2 Part 3-1 addressing International Maritime Organization (IMO) requirements for watchkeeping at sea.

Conclusion. The Work Group agreed that sufficient regulations and guidelines exist under federal and international law for crewing requirements. These regulations and guidelines set out watch standards for mariners on ships. Federal regulations regulate only U.S.-flagged ships, while the COLREGS and STCW Code pertain to all ships.

The Work Group noted that crew staffing did not appear to be an issue in the Cosco Busan incident, but was raised in the Governor's Directive as an issue to address.

Recommendation to the Harbor Safety Committee. The Work Group recommends to the Harbor Safety Committee that no additional measures be proposed regarding crew staffing requirements in limited visibility.

Selected COLREGS:

Rule 5

Look-out

Every vessel shall at all times maintain a proper look-out by sight as well as by 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

Safe Speed

Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions.

In determining a safe speed the following factors shall be among those taken into account:

(a) By all vessels:

(i) The state of visibility;

(ii) The traffic density including concentrations of fishing vessels or any other vessels;

(iii) The manageability of the vessel with special reference to stopping distance and turning ability in the prevailing conditions;

(iv) At night the presence of background light such as from shore lights or from back scatter from her own lights;

(v) The state of wind, sea and current, and the proximity of navigational hazards;

(vi) The draft in relation to the available depth of water.

(b) Additionally, by vessels with operational radar:

(i) The characteristics, efficiency and limitations of the radar equipment;

(ii) Any constraints imposed by the radar range scale in use;

(iii) The effect on radar detection of the sea state, weather and other sources of interference;

(iv) The possibility that small vessels, ice and other floating objects may not be detected by radar at an adequate range;

(v) The number location and movement of vessels detected by radar;

(vi) The more exact assessment of the visibility that may be possible when radar is used to determine the range of vessels or other objects in the vicinity.

Rule 19

Conduct of Vessels in Restricted Visibility

- (a) This rule applies to vessels not in sight of one another when navigating in or near an area of restricted visibility.
- (b) Every vessel shall proceed at a safe speed adapted to the prevailing circumstances and condition of restricted visibility. A power driven vessel shall have her engines ready for immediate maneuver.
- (c) Every vessel shall have due regard to the prevailing circumstances and conditions of restricted visibility when complying with the Rules of Section I of this Part.
- (d) A vessel which detects by radar alone the presence of another vessel shall determine if a close-quarters situation is developing and/or risk of collision exists. If so, she shall take avoiding action in ample time, provided that when such action consists of an alteration in course, so far as possible the following shall be avoided:
 - (i) An alteration of course to port for a vessel forward of the beam, other than for a vessel being overtaken;
 - (ii) An alteration of course toward a vessel abeam or abaft the beam.
- (e) Except where it has been determined that a risk of collision does not exist, every vessel which hears apparently forward of her beam the fog signal of another vessel, or which cannot avoid a close-quarters situation with another vessel forward of her beam, shall reduce her speed to be the minimum at which she can be kept on her course. She shall if necessary take all her way off and in any event navigate with extreme caution until danger of collision is over.

TITLE 46--SHIPPING

CHAPTER I--COAST GUARD, DEPARTMENT OF HOMELAND SECURITY

PART 15_MANNING REQUIREMENTS--Table of Contents

Subpart F_Limitations and Qualifying Factors

Sec. 15.705 Watches.

(a) Title 46 U.S.C. 8104 is the law applicable to the establishment of watches aboard certain U.S. vessels. The establishment of adequate watches is the responsibility of the vessel's master. The Coast Guard interprets the term watch to be the direct performance of vessel operations, whether deck or engine, where such operations would routinely be controlled and performed in a scheduled and fixed rotation.

The performance of maintenance or work necessary to the vessel's safe operation on a daily basis does not in itself constitute the establishment of a watch. The minimum safe manning levels specified in a

vessel's certificate of inspection take into consideration routine maintenance requirements and ability of the crew to perform all operational evolutions, including emergencies, as well as those functions which may be assigned to persons in watches.

(b) Subject to exceptions, 46 U.S.C. 8104 requires that when a master of a seagoing vessel of more than 100 gross tons establishes watches for the licensed individuals, sailors, coal passers, firemen, oilers and watertenders, the personnel shall be divided, when at sea, into at least three watches and shall be kept on duty successively to

perform ordinary work incident to the operation and management of the vessel. The Coast Guard interprets sailors to mean those members of the deck department other than licensed officers, whose duties involve the mechanics of conducting the ship on its voyage, such as helmsman (wheelsman), lookout, etc., and which are necessary to the maintenance of a continuous watch. Sailors is not interpreted to include able seamen

and ordinary seamen not performing these duties.

(c) Subject to exceptions, 46 U.S.C. 8104(g) permits the licensed individuals and crew members (except the coal passers, firemen, oilers, and watertenders) to be divided into two watches when at sea and engaged

on a voyage of less than 600 miles on the following categories of vessels:

- (1) Towing vessel;
- (2) Offshore supply vessel; or,
- (3) Barge.

(d) Subject to exceptions, 46 U.S.C. 8104(h) permits a licensed master or mate (pilot) operating a towing vessel that is at least 26 feet in length measured from end to end over the deck (excluding sheer) to work not more than 12 hours in a consecutive 24 hour period except in

an emergency. The Coast Guard interprets this, in conjunction with other

provisions of the law, to permit licensed masters or mates (pilots) serving as operators of towing vessels that are not subject to the provisions of the Officers' Competency Certificates Convention, 1936, to

be divided into two watches regardless of the length of the voyage.

(e) Fish processing vessels are subject to various provisions of 46 U.S.C. 8104 concerning watches.

(1) For fish processing vessels that entered into service before January 1, 1988, the following watch requirements apply to the licensed officers and deck crew:

(i) If over 5000 gross tons--three watches.

(ii) If more than 1600 gross tons and not more than 5000 gross tons--two watches.

(iii) If not more than 1600 gross tons--no watch division specified.

(2) For fish Processing vessels which enter into service after December 31, 1987, the following watch requirements apply to the licensed officers and deck crew:

(i) If over 5000 gross tons--three watches.

(ii) If not more than 5000 gross tons and having more than 16 individuals on board primarily employed in the preparation of fish or fish products--two watches.

(iii) If not more than 5000 gross tons and having not more than 16 individuals on board primarily employed in the preparation of fish or fish products--no watch division specified.

(f) Properly manned uninspected passenger vessels of at least 100 gross tons--

(1) Which are underway for no more than 12 hours in any 24-hour period,

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and which are adequately moored, anchored, or otherwise secured in a harbor of safe refuge for the remainder of that 24-hour period may operate with one navigational watch;

(2) Which are underway more than 12 hours in any 24-hour period must

provide a minimum of a two-watch system;

(3) In no case may the crew of any watch work more than 12 hours in any 24-hour period, except in an emergency.

[CGD 81-059, 52 FR 38652, Oct. 16, 1987, as amended by USCG-1999-6224, 64 FR 63235, Nov. 19, 1999; USCG-1999-5040, May 15, 2002; USCG-2004-18884, 69 FR 58343, Sept. 30, 2004]

Seafarer's Training, Certification & Watchkeeping (STCW) Code

Chapter VIII of the STCW Annex, and the associated sections of the STCW Code, are a consolidation of material relating to watchkeeping arrangements. The primary focus of the STCW convention is to ensure that an effective watch is maintained on all seagoing ships, by qualified and fit personnel under all circumstances. Part 3 of Chapter VIII addresses maintaining a watch at sea.

PART 3 - WATCHKEEPING AT SEA

Principles applying to watchkeeping generally

8 Parties shall direct the attention of companies, masters, chief engineer officers and watchkeeping personnel to the following principles which shall be observed to ensure that safe watches are maintained at all times.

9 The master of every ship is bound to ensure that watchkeeping arrangements are adequate for maintaining a safe navigational watch. Under the master's general direction, the officers of the navigational watch are responsible for navigating the ship safely during their periods of duty, when they will be particularly concerned with avoiding collision and stranding.

10 The chief engineer officer of every ship is bound, in consultation with the master, to ensure that watchkeeping arrangements are adequate to maintain a safe engineering watch.

Protection of marine environment

11 The master, officers and ratings shall be aware of the serious effects of operational or accidental pollution of the marine environment and shall take all possible precautions to prevent such pollution, particularly within the framework of relevant international and port regulations.

PART 3-1 - PRINCIPLES TO BE OBSERVED IN KEEPING A NAVIGATIONAL WATCH

12 The officer in charge of the navigational watch is the master's representative and is primarily responsible at all times for the safe navigation of the ship and for complying with the International Regulations for Preventing Collisions at Sea, 1972.

Look-out

13 A proper look-out shall be maintained at all times in compliance with rule 5 of the International Regulations for Preventing Collisions at Sea, 1972 and shall serve the purpose of:

.1 maintaining a continuous state of vigilance by sight and hearing as well as by all other available means, with regard to any significant change in the operating environment;

.2 fully appraising the situation and the risk of collision, stranding and other dangers to navigation; and

.3 detecting ships or aircraft in distress, shipwrecked persons, wrecks, debris and other hazards to safe navigation.

14 The look-out must be able to give full attention to the keeping of a proper look-out and no other duties shall be undertaken or assigned which could interfere with that task.

15 The duties of the look-out and helmsperson are separate and the helmsperson shall not be considered to be the look-out while steering, except in small ships where an unobstructed all-round view is provided at the steering position and there is no impairment of night vision or other impediment to the keeping of a proper look-out. The officer in charge of the navigational watch may be the sole look-out in daylight provided that on each such occasion:

.1 the situation has been carefully assessed and it has been established without doubt that it is safe to do so;

.2 full account has been taken of all relevant factors including, but not limited to:

- state of weather,

- visibility,

- traffic density,

- proximity of dangers to navigation, and

- the attention necessary when navigating in or near traffic separation schemes; and

.3 assistance is immediately available to be summoned to the bridge when any change in the situation so requires.

16 In determining that the composition of the navigational watch is adequate to ensure that a proper look-out can continuously be maintained, the master shall take into account all relevant factors, including those described in this section of the Code, as well as the following factors:

.1 visibility, state of weather and sea;

.2 traffic density, and other activities occurring in the area in which the vessel is navigating;

.3 the attention necessary when navigating in or near traffic separation schemes or other routing measures;

.4 the additional workload caused by the nature of the ship's functions, immediate operating requirements and anticipated manoeuvres;

- .5 the fitness for duty of any crew members on call who are assigned as members of the watch;
- .6 knowledge of and confidence in the professional competence of the ship's officers and crew;
- .7 the experience of each officer of the navigational watch, and the familiarity of that officer with the ship's equipment, procedures, and manoeuvring capability;
- .8 activities taking place on board the ship at any particular time, including radiocommunication activities and the availability of assistance to be summoned immediately to the bridge when necessary;
- .9 the operational status of bridge instrumentation and controls, including alarm systems;
- .10 rudder and propeller control and ship manoeuvring characteristics;
- .11 the size of the ship and the field of vision available from the conning position;
- .12 the configuration of the bridge, to the extent such configuration might inhibit a member of the watch from detecting by sight or hearing any external development; and
- .13 any other relevant standard, procedure or guidance relating to watchkeeping arrangements and fitness for duty which has been adopted by the Organization.

Watch arrangements

17 When deciding the composition of the watch on the bridge, which may include appropriately qualified ratings, the following factors, inter alia, shall be taken into account:

- .1 at no time shall the bridge be left unattended;
- .2 weather conditions, visibility and whether there is daylight or darkness;
- .3 proximity of navigational hazards which may make it necessary for the officer in charge of the watch to carry out additional navigational duties;
- .4 use and operational condition of navigational aids such as radar or electronic position-indicating devices and any other equipment affecting the safe navigation of the ship;
- .5 whether the ship is fitted with automatic steering;
- .6 whether there are radio duties to be performed;
- .7 unmanned machinery space (UMS) controls, alarms and indicators provided on the bridge, procedures for their use and limitations; and
- .8 any unusual demands on the navigational watch that may arise as a result of special operational circumstances.

Taking over the watch

18 The officer in charge of the navigational watch shall not hand over the watch to the relieving officer if there is reason to believe that the latter is not capable of carrying out the watchkeeping duties effectively, in which case the master shall be notified.

19 The relieving officer shall ensure that the members of the relieving watch are fully capable of performing their duties, particularly as regards their adjustment to night vision. Relieving officers shall not take over the watch until their vision is fully adjusted to the light conditions.

20 Prior to taking over the watch relieving officers shall satisfy themselves as to the ship's estimated or true position and confirm its intended track, course and speed, and UMS controls as appropriate and shall note any dangers to navigation expected to be encountered during their watch.

21 Relieving officers shall personally satisfy themselves regarding the:

.1 standing orders and other special instructions of the master relating to navigation of the ship;

.2 position, course, speed and draught of the ship;

.3 prevailing and predicted tides, currents, weather, visibility and the effect of these factors upon course and speed;

.4 procedures for the use of main engines to manoeuvre when the main engines are on bridge control; and

.5 navigational situation, including but not limited to:

.5.1 the operational condition of all navigational and safety equipment being used or likely to be used during the watch,

.5.2 the errors of gyro and magnetic compasses,

.5.3 the presence and movement of ships in sight or known to be in the vicinity,

.5.4 the conditions and hazards likely to be encountered during the watch, and

.5.5 the possible effects of heel, trim, water density and squat on under keel clearance.

22 If at any time the officer in charge of the navigational watch is to be relieved when a manoeuvre or other action to avoid any hazard is taking place, the relief of that officer shall be deferred until such action has been completed.

Performing the navigational watch

23 The officer in charge of the navigational watch shall:

.1 keep the watch on the bridge;

.2 in no circumstances leave the bridge until properly relieved;

.3 continue to be responsible for the safe navigation of the ship, despite the presence of the master on the bridge, until informed specifically that the master has assumed that responsibility and this is mutually understood; and

.4 notify the master when in any doubt as to what action to take in the interest of safety.

24 During the watch the course steered, position and speed shall be checked at sufficiently frequent intervals, using any available navigational aids necessary, to ensure that the ship follows the planned course.

25 The officer in charge of the navigational watch shall have full knowledge of the location and operation of all safety and navigational equipment on board the ship and shall be aware and take account of the operating limitations of such equipment.

26 The officer in charge of the navigational watch shall not be assigned or undertake any duties which would interfere with the safe navigation of the ship.

27 Officers of the navigational watch shall make the most effective use of all navigational equipment at their disposal.

28 When using radar, the officer in charge of the navigational watch shall bear in mind the necessity to comply at all times with the provisions on the use of radar contained in the International Regulations for Preventing Collisions at Sea, in force.

29 In cases of need the officer in charge of the navigational watch shall not hesitate to use the helm, engines and sound signalling apparatus. However, timely notice of intended variations of engine speed shall be given where possible or effective use made of UMS engine controls provided on the bridge in accordance with the applicable procedures.

30 Officers of the navigational watch shall know the handling characteristics of their ship, including its stopping distances, and should appreciate that other ships may have different handling characteristics.

31 A proper record shall be kept during the watch of the movements and activities relating to the navigation of the ship.

32 It is of special importance that at all times the officer in charge of the navigational watch ensures that a proper look-out is maintained. In a ship with a separate chart room the officer in charge of the navigational watch may visit the chart room, when essential, for a short period for the necessary performance of navigational duties, but shall first ensure that it is safe to do so and that proper look-out is maintained.

33 Operational tests of shipboard navigational equipment shall be carried out at sea as frequently as practicable and as circumstances permit, in particular before hazardous conditions affecting navigation are expected. Whenever appropriate, these tests shall be recorded. Such tests shall also be carried out prior to port arrival and departure.

34 The officer in charge of the navigational watch shall make regular checks to ensure that:

- .1 the person steering the ship or the automatic pilot is steering the correct course;
- .2 the standard compass error is determined at least once a watch and, when possible, after any major alteration of course; the standard and gyro-compasses are frequently compared and repeaters are synchronized with their master compass;
- .3 the automatic pilot is tested manually at least once a watch;
- .4 the navigation and signal lights and other navigational equipment are functioning properly;
- .5 the radio equipment is functioning properly in accordance with paragraph 86 of this section; and
- .6 the UMS controls, alarms and indicators are functioning properly.

35 The officer in charge of the navigational watch shall bear in mind the necessity to comply at all times with the requirements in force of the International Convention for the Safety of Life at Sea, (SOLAS) 1974*. The officer of the navigational watch shall take into account:

- .1 the need to station a person to steer the ship and to put the steering into manual control in good time to allow any potentially hazardous situation to be dealt with in a safe manner; and
- .2 that with a ship under automatic steering it is highly dangerous to allow a situation to develop to the point where the officer in charge of the navigational watch is without assistance and has to break the continuity of the look-out in order to take emergency action.

36 Officers of the navigational watch shall be thoroughly familiar with the use of all electronic navigational aids carried, including their capabilities and limitations, and shall use each of these aids when appropriate and shall bear in mind that the echo-sounder is a valuable navigational aid.

37 The officer in charge of the navigational watch shall use the radar whenever restricted visibility is encountered or expected, and at all times in congested waters having due regard to its limitations.

38 The officer in charge of the navigational watch shall ensure that range scales employed are changed at sufficiently frequent intervals so that echoes are detected as early as possible. It shall be borne in mind that small or poor echoes may escape detection.

39 Whenever radar is in use, the officer in charge of the navigational watch shall select an appropriate range scale and observe the display carefully, and shall ensure that plotting or systematic analysis is commenced in ample time.

40 The officer in charge of the navigational watch shall notify the master immediately:

- .1 if restricted visibility is encountered or expected;
- .2 if the traffic conditions or the movements of other ships are causing concern;
- .3 if difficulty is experienced in maintaining course;
- .4 on failure to sight land, a navigation mark or to obtain soundings by the expected time;
- .5 if, unexpectedly, land or a navigation mark is sighted or a change in soundings occurs;
- .6 on breakdown of the engines, propulsion machinery remote control, steering gear or any essential navigational equipment, alarm or indicator;
- .7 if the radio equipment malfunctions;
- .8 in heavy weather, if in any doubt about the possibility of weather damage;
- .9 if the ship meets any hazard to navigation, such as ice or a derelict; and
- .10 in any other emergency or if in any doubt.

41 Despite the requirement to notify the master immediately in the foregoing circumstances, the officer in charge of the navigational watch shall in addition not hesitate to take immediate action for the safety of the ship, where circumstances so require.

42 The officer in charge of the navigational watch shall give watchkeeping personnel all appropriate instructions and information which will ensure the keeping of a safe watch, including a proper look-out.

Watchkeeping under different conditions and in different areas

Clear weather

43 The officer in charge of the navigational watch shall take frequent and accurate compass bearings of approaching ships as a means of early detection of risk of collision and bear in mind that such risk may sometimes exist even when an appreciable bearing change is evident, particularly when approaching a very large ship or a tow or when approaching a ship at close range. The officer in charge of the navigational watch shall also take early and positive action in compliance with the applicable International Regulations for Preventing Collisions at Sea, 1972 and subsequently check that such action is having the desired effect.

44 In clear weather, whenever possible, the officer in charge of the navigational watch shall carry out radar practice.

Restricted visibility

45 When restricted visibility is encountered or expected, the first responsibility of the officer in charge of the navigational watch is to comply with the relevant rules of the International Regulations for Preventing Collisions at Sea, 1972 with particular regard to

the sounding of fog signals, proceeding at a safe speed and having the engines ready for immediate manoeuvre. In addition, the officer in charge of the navigational watch shall:

.1 inform the master;

.2 post a proper look-out;

.3 exhibit navigation lights; and

.4 operate and use the radar.

In hours of darkness

46 The master and the officer in charge of the navigational watch when arranging look-out duty shall have due regard to the bridge equipment and navigational aids available for use, their limitations; procedures and safeguards implemented.

Coastal and congested waters

47 The largest scale chart on board, suitable for the area and corrected with the latest available information, shall be used. Fixes shall be taken at frequent intervals, and shall be carried out by more than one method whenever circumstances allow.

48 The officer in charge of the navigational watch shall positively identify all relevant navigation marks.

Navigation with pilot on board

49 Despite the duties and obligations of pilots, their presence on board does not relieve the master or officer in charge of the navigational watch from their duties and obligations for the safety of the ship. The master and the pilot shall exchange information regarding navigation procedures, local conditions and the ship's characteristics. The master and/or the officer in charge of the navigational watch shall co-operate closely with the pilot and maintain an accurate check on the ship's position and movement.

50 If in any doubt as to the pilot's actions or intentions, the officer in charge of the navigational watch shall seek clarification from the pilot and, if doubt still exists, shall notify the master immediately and take whatever action is necessary before the master arrives.

Ship at anchor

51 If the master considers it necessary, a continuous navigational watch shall be maintained at anchor. While at anchor, the officer in charge of the navigational watch shall:

.1 determine and plot the ship's position on the appropriate chart as soon as practicable;

.2 when circumstances permit, check at sufficiently frequent intervals whether the ship is remaining securely at anchor by taking bearings of fixed navigation marks or readily identifiable shore objects;

- .3 ensure that proper look-out is maintained;
- .4 ensure that inspection rounds of the ship are made periodically;
- .5 observe meteorological and tidal conditions and the state of the sea;
- .6 notify the master and undertake all necessary measures if the ship drags anchor;
- .7 ensure that the state of readiness of the main engines and other machinery is in accordance with the master's instructions;
- .8 if visibility deteriorates, notify the master;
- .9 ensure that the ship exhibits the appropriate lights and shapes and that appropriate sound signals are made in accordance with all applicable regulations; and
- .10 take measures to protect the environment from pollution by the ship and comply with applicable pollution regulations.

Note: to view entire STCW document, see IMO or U.S. Coast Guard web sites:

http://www.imo.org/includes/blastDataOnly.asp/data_id%3D7864/STCWCode.pdf

<http://www.uscg.mil/STCW/stcw-code-ach8.htm>