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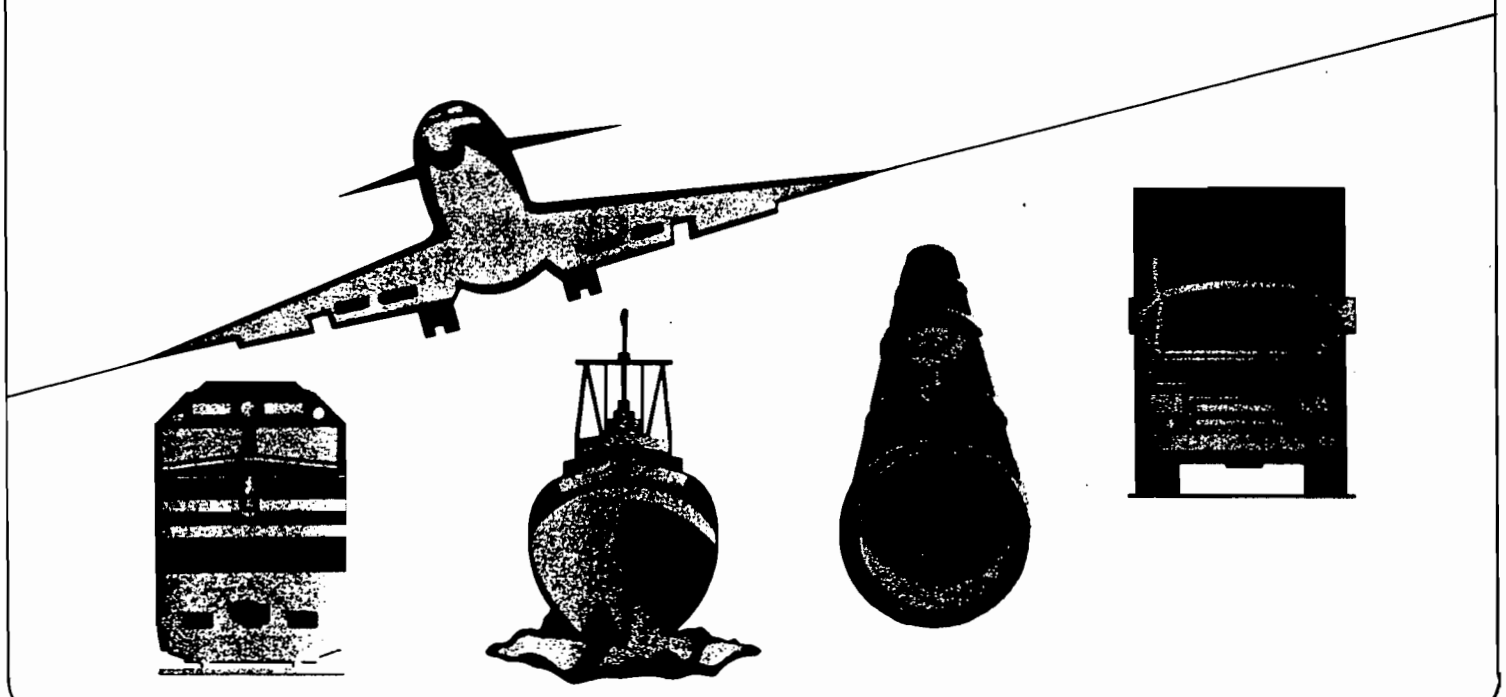
NATIONAL TRANSPORTATION SAFETY BOARD

SAFETY STUDY

PASSENGER VESSELS OPERATING FROM U.S. PORTS



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16. Abstract

In 1988, the National Transportation Safety Board began a study to examine passenger vessel safety in the United States. The study addresses needed safety improvements for domestic passenger vessels, foreign flag passenger vessels, and State-regulated passenger vessels that operate exclusively on State waters or do not carry passengers for hire. The study is divided into three parts. Part 1 discusses accidents, safety issues, and the current and proposed U.S. Coast Guard regulations relating to domestic passenger vessels, except those carrying six or fewer passengers. Part 2 discusses international safety guidance, the Coast Guard's Control Verification and Examination Program, and safety oversight relating to foreign flag passenger vessels. Part 3 discusses safety oversight programs of some States relating to State-regulated passenger vessels. As a result of this safety study, recommendations have been issued to the U.S. Coast Guard, the National Association of Small Passenger Vessel Owners, the Cruise Lines International Association, the National Association of State Boating Law Administrators, cruise vessel owners and operators, and Washington State and its ferry system.

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EXECUTIVE SUMMARY

In 1988, the National Transportation Safety Board began a safety study to examine actions taken by agencies and organizations to address passenger vessel safety in the United States. The study addresses needed safety improvements for domestic passenger vessels, foreign flag passenger vessels, and State-regulated passenger vessels that operate exclusively on State waters or do not carry passengers for hire. The study is divided into three distinct parts: safety issues relating to domestic passenger vessels; safety issues relating to foreign flag passenger vessels operating from U.S. ports and embarking U.S. passengers; and safety needs for State-regulated passenger vessels.

The safety issues discussed in the first part on domestic passenger vessels are:

- licensing, with qualification requirements, for masters of small passenger vessels;
- training of masters and crewmembers;
- admeasurement and requirements for basic safety equipment and manning;
- lifesaving equipment requirements;
- passenger information and drill requirements;
- improvements to the alcohol and drug rules issued by the U.S. Coast Guard; and
- fatigue.

Safety issues addressed in the second part on foreign flag passenger vessels are:

- safety oversight;
- fire protection safety improvements;
- shoreside fire contingency planning;
- training and drill requirements;
- language barriers;
- accident reporting and investigation;
- interpretation of the Safety of Life at Sea Convention (SOLAS);

- use of U.S. Subchapter T regulations pertaining to small passenger vessels for foreign flag passenger vessels;
- location of life jackets;
- mass casualty planning; and
- application of U.S. Coast Guard alcohol and drug rules to foreign flag passenger vessels.

The following safety issues are discussed in the part on State-regulated passenger vessels:

- minimum standards or guidelines for vessel stability; and
- safety oversight.

As a result of this safety study, recommendations have been issued to the U.S. Coast Guard, the National Association of Small Passenger Vessel Owners, the Cruise Lines International Association, the National Association of State Boating Law Administrators, cruise vessel owners and operators, and Washington State and its ferry system.

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

SAFETY STUDY

PASSENGER VESSELS OPERATING FROM U.S. PORTS

INTRODUCTION

Background

Passenger vessels operating from ports in the United States during 1988 carried an estimated 6.75 million passengers, excluding passengers carried by ferry vessels. The number of passengers is projected to increase by about 20 percent by 1995. The National Transportation Safety Board is concerned that there is serious potential for a high loss of life.

The Safety Board has been committed to improving the safety of vessels carrying U.S. passengers from U.S. ports. This study reviews safety issues for three broad groups of vessels: domestic passenger vessels, foreign flag passenger vessels operating from U.S. ports and carrying U.S. passengers, and some State-regulated domestic passenger vessels.[1]

For purposes of this study the following categories of passenger vessels are included:

- Domestic large passenger vessels, 100 gross tons or more subject to U.S. Coast Guard regulations (Subchapter H, "Passenger Vessels") and/or the requirements of the international convention for the Safety of Life at Sea (SOLAS 74 as amended).

- Domestic small passenger vessels, less than 100 gross tons carrying more than six passengers for hire subject to less stringent U.S. Coast Guard regulations (Subchapter T, "Small Passenger Vessels"). This study does not address small passenger vessels carrying six or less passengers for hire, which are required to meet U.S. Coast Guard requirements with the exception of safety equipment requirements for recreational boats and a licensed operator.

- Foreign flag passenger vessels that are generally subject to the international

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[1]The term "State-regulated domestic passenger vessel" used in this report denotes a domestic vessel generally not subject to U.S. Coast Guard materiel inspection, certification, and standards in such areas as hull, machinery, lifesaving and fire fighting equipment, and navigation equipment. Additionally, the vessels are not subject to Federal manning requirements.

convention of Safety of Life at Sea (SOLAS) but, in some cases to U.S. regulations, applied when these vessels are exempted from SOLAS requirements by the flag Administration.[2] The U.S. Coast Guard verifies that these vessels meet SOLAS requirements when operating from U.S. ports through a program termed the "Control Verification or Examination of Foreign Vessel."[3]

- State-regulated passenger vessels that operate exclusively on State waters (non-Federal waters) or that do not carry passengers for hire. This study does not address private pleasure craft.

An estimated 5,000 U.S. passenger vessels of all types and more than 80 foreign flag passenger vessels regularly operate from U.S. ports.

Examples of Passenger Vessel Accidents

The passenger vessel industry operating from U.S. ports has had accidents with large loss of life, such as the fire on the Panamanian passenger vessel YARMOUTH CASTLE on November 13, 1965 (87 passengers were killed) and the collision of the U.S. passenger ferry GEORGE PRINCE with the Norwegian freighter FROSTA on October 20, 1976 (76 were killed). Several other accidents (ANGELINA LAURO, SCANDINAVIAN SUN, SCANDINAVIAN SEA, EMERALD SEAS, SCANDINAVIAN STAR, PILGRIM BELLE, and KLAHOWYA) and several recent accidents involving domestic and foreign flag passenger vessels also indicate serious safety issues. For example, on September 15, 1988, the U.S. small passenger vessel COUGAR sank in the Pacific Ocean offshore from Depoe Bay, Oregon, resulting in the loss of four passengers and one crewmember. On November 8, 1988, the Norwegian passenger vessel SONG OF AMERICA operated by the Miami-based Royal Caribbean Cruise Lines had a piston seize in one of its engines with a resultant fire caused by debris penetrating a lubricating oil return pipeline. On December 16, 1988, the U.S. large passenger vessel MONTEREY, operated by the Hawaii-based Aloha Pacific Company, had an electrical short circuit that resulted in a loss of power for 4 1/2 hours, and the vessel drifted perilously close (200 yards) to the rocky Hamakua coast near Hilo, Hawaii. On January 4, 1989, the MONTEREY lost power again from an electrical problem. On February 10, 1989, the Liberian passenger vessel CELEBRATION, operated by the Miami-based Carnival Cruise Lines, struck and sank the Cuban bulk cement carrier CAPITAN SAN LUIS off the coast of

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[2]Flag Administration is the government of the state of ship registry; the ship is entitled to fly that government's flag.

[3]The program is described in the U.S. Coast Guard Marine Safty Manual, Chapter 20, "Examination of Foreign Vessels Subject to SOLAS (Safety of Life at Sea)."

Cuba; 3 lives were lost and 13 persons injured. On February 15, 1989, the Panamanian passenger vessel VIKING PRINCESS operated by the West Palm Beach Crown Cruise Lines, lost bridge propulsion control of the main engine and rammed the docked U.S. Navy vessel LCM YUF97 at Palm Beach, Florida. On March 11, 1989, the Panamanian passenger vessel EUROPA STAR, operated by the Florida-based Europa Cruise Lines, rammed the docked U.S. passenger vessel ATLANTIS at Madeira Beach, Florida. On April 18, 1989, the EUROPA SUN, the sister vessel to the EUROPA STAR, rammed a boardwalk and restaurant in the same city.

Three accidents investigated by the Safety Board illustrate some of the safety issues addressed in this study: licensing; manning; training; the use of admeasurement[4] exemptions, reductions in tonnage, and techniques to skirt Federal regulatory safety requirements; safety equipment; passenger safety; fire protection; language barriers; and safety oversight. These three accidents are referred to throughout the report: (1) the grounding of the M/V PILGRIM BELLE (a domestic small passenger vessel); (2) the collision of the M/V KLAHOWYA (a large passenger vessel) and the M/V SANKO GRAIN; and (3) the fire on the M/V SCANDINAVIAN STAR (a foreign flag passenger vessel). A brief account of each accident follows.

On July 28, 1985, the M/V PILGRIM BELLE, a U.S. registered, 192-foot, 96-gross ton, small passenger vessel, ran aground on the Sow and Pigs Reef, Vineyard Sound, Massachusetts (NTSB 1986a). The master was informed that the vessel was taking on water. He immediately ordered passengers and crew to abandon ship and then broadcast a distress message to the U.S. Coast Guard. The 84 passengers and 16 crewmembers were taken to a fishing vessel, the FARE LADY, and to Cuttyhunk Island by recreational boats operating in the area and by the PILGRIM BELLE's launch. They were later transferred to a U.S. Coast Guard station. Eight crewmembers and a representative of the shipyard and builder stayed with the damaged vessel. The PILGRIM BELLE did not sink. Damage and repair costs were $357,000.

The Safety Board determined that the probable cause of the grounding of the PILGRIM BELLE was the failure of the master to actively direct the navigation of his vessel, to plot a course to alert himself to the possible dangers along the route, and to take and plot navigation fixes to monitor the vessel's positions accurately. Contributing to the accident was the failure of the mate to warn the master that the vessel was approaching close to Sow and Pigs Reef.

The Safety Board's investigation of this accident led to several conclusions:

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[4]Admeasurement determines the cargo-carrying volume of a vessel. The U.S. Coast Guard admeasurement regulations are given in 46 CFR Part 69. The regulations are now subject to rulemaking action CGD 87-015b, "Tonnage Measurement of Vessels," issued April 26, 1989, as a notice of proposed rulemaking in 54 FR 17968. The final rule was issued on September 12, 1989, in 54 FR 37652.

- The admeasurement of gross tonnage used for U.S. small passenger vessels does not accurately reflect the size of a vessel or the risk of loss of life. The admeasurement is used, however, to determine crew size, licensing requirements, shipboard construction, lifesaving and firefighting equipment, and structural fire protection.[5] (Admeasurement and proposed rulemaking concerning admeasurement are discussed in chapter 3.)

- Primary lifesaving equipment was insufficient for the number of passengers and crewmembers on board. Such equipment should keep all persons out of the water and would reduce the effects of hypothermia and make it easier to locate persons abandoning a vessel.

- Fire protection requirements for small passenger vessels do not ensure adequate protection for some types of enginerooms because they do not specify fixed firefighting systems.

- License requirements for masters of small passenger vessels do not test the applicant's knowledge of passenger vessel regulations on structural fire protection and damage stability (knowledge of actions to take to keep the vessel afloat after an accident).

- Some owners of small passenger vessels do not provide an operations manual to guide shipboard personnel in their duties and responsibilities.

- Navigation policies, written guidance, and training of masters and mates on vessels are not provided by some operators nor are they required to be before such employees are placed in charge of a passenger vessel.

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[5]The unit of admeasurement used in the United States is 1 gross ton, equivalent to 100 cubic feet of hull volume. A vessel's gross tonnage in the United States is the total volume of measurable spaces below the main deck. The PILGRIM BELLE admeasured 96 gross tons under the U.S. system. Under the 1969 International Tonnage Convention used by all other countries, the vessel would admeasure more than 1,600 gross tons and would therefore be required to carry additional safety and navigation equipment.

On January 13, 1981, the Washington State Ferry M/V KLAHOWYA (310 feet long; 1,334 gross tons), en route to Seattle, collided with the outbound Liberian freighter M/V SANKO GRAIN (514 feet long; 12,272 gross tons) in dense fog in Elliott Bay, Puget Sound (NTSB 1982). There were no injuries to the ferry's passengers (an exact count of the passengers was not determined) or to the vessels' crews. The vessels sustained minor damage, estimated at $117,000, and both were able to continue operations. The Safety Board investigated the accident because of the potentially catastrophic consequences relevant to other ferry operations carrying hundreds of passengers.

The Safety Board determined that the probable cause of this accident was the failure of the KLAHOWYA's pilot to order hard right rudder after advising the SANKO GRAIN's bridgewatch by radiotelephone that he would do so. Contributing to the accident was the KLAHOWYA's excessive speed in fog, inadequate navigation equipment, and poor navigation procedures by the bridgewatch.

The Safety Board's report of this accident documented several safety issues:

- Excessive speed in adverse weather conditions with limited visibility.
- The need for additional crew training in use of navigation and communications equipment.
- The need for established means of informing ferry passengers in advance of actions necessary should an emergency occur.
- The need for additional equipment for ferries, such as lifesaving and navigation equipment, regardless of gross tonnage (admeasurement).
- The need for realistic contingency plans that consider environmental conditions, water, and ferry crew limitations.

On March 15, 1988, a fire occurred in the engineroom of the Bahamian passenger vessel SCANDINAVIAN STAR (465 feet long; 10,513 gross tons) (NTSB 1989). The ship was en route from Cozumel, Mexico, to St. Petersburg, Florida, with 439 passengers and 268 crewmembers on board. The vessel lost the ship service generator and the emergency generator 16 minutes after the fire started. The vessel's four fire pumps were rendered inoperative by this loss of power. A failure of the remote and manual release mechanisms of the ship's fixed firefighting system required a crewmember to open each of the 36 bottles of CO_2 designated for the engineroom, by hand, one at a time. The fire was confined to the main engineroom and to the port and starboard stack trunk areas. An hour after the main and emergency electrical power was lost, the emergency generator problem was solved and emergency generator power was provided to the vessel. In the meantime, the emergency battery electrical

power system came on line, providing power for the fire alarm, general alarm, navigation lights, lighting in the passageways, stairwells, and lifeboat embarkation areas. The crew monitored the temperatures of the bulkheads and deck surrounding the engineroom; about 6 hours after the fire had started, the temperatures began to decrease. The fire was determined to be extinguished about 16 hours after it was reported. One passenger was injured when he fell down the vessel's stairs, one passenger had chest pains when a pre-existing disease was aggravated, and two crewmembers received minor injuries. Property damage to the vessel was estimated at $5,250,000.

The Safety Board determined that the probable cause of the uncontrolled engineroom fire on board the SCANDINAVIAN STAR was (1) the lack of a preventive maintenance program for the engineroom that resulted in the failure to replace deteriorated fuel pipe packing seals and deflector sleeves, (2) inadequate crew training, and (3) the lack of written procedures for engineroom emergency firefighting. Contributing to the severity of the emergency was the malfunctioning of the ship's fixed CO_2 fire suppression system, and the inability of some crewmembers to communicate in a common language with each other and with passengers.

As a result of its investigation of this accident, the Safety Board identified several safety issues:

- The need to improve the U.S. Coast Guard's program for Control Verification or Examination of Foreign Vessels by the addition of further requirements, such as requiring annual examinations of fire extinguishing systems and a more detailed examination of emergency generators.

- The need to establish requirements to eliminate language barriers among crewmembers responsible for the safety of the vessel and passengers.

- The need to amend the SOLAS requirements to ensure that operating instructions and plans for vital and emergency ship components are written in a language understood by the ship's officers and the Coast Guard.

- The need to develop and implement written engineroom instructions for emergency procedures, to conduct regularly scheduled engineroom emergency drills, and to ensure that all crewmembers are familiar with the written emergency procedures.

- The need to establish requirements for the automatic shutdown of ventilation systems when smoke sensing units are activated to prevent

the spread of smoke into accommodation and public spaces, passageways, stairwells, and other compartments.

Study Methods

This study was conducted to explore safety issues relative to passenger vessels (except domestic small passenger vessels carrying six or less passengers), and to urge that appropriate action be taken before further serious accidents and loss of life occur, and to make additional safety recommendations if necessary.

The study is based on the results of the Safety Board's 36 accident investigations of passenger vessels over the past 15 years, pertinent safety recommendations issued by the Safety Board, and the responses of the organizations to whom the recommendations were made. The Safety Board staff also interviewed more than 100 persons directly involved in the passenger vessel industry (domestic and foreign flag vessels operating from U.S. ports), including vessel owners, masters, marine surveyors, heads of passenger vessel associations, Federal and State officials, delegation members to the International Maritime Organization (IMO), naval architects, and others. A list of the organizations is given in appendix A. The organizations and persons interviewed represent a cross section of the foreign and domestic passenger vessel industry operating from ports in the United States.

The Safety Board also reviewed Coast Guard computerized accident data (CASMAIN system) on passenger vessels for the period 1981-87, applicable Coast Guard safety regulations for passenger vessels, and the applicable portions of the international conventions for the Safety of Life at Sea (SOLAS) of 1929, 1948, 1960, and 1974. The most recent SOLAS requirements are in the 1986 text consolidating the 1974 SOLAS convention, the 1978 SOLAS protocol, and the 1981 and 1983 SOLAS amendments (International Maritime Organization 1986). Further, a Safety Board staff member collected information and documented the positions on fire protection concerns expressed by other countries at the 1989 meeting of the IMO Subcommittee on Fire Protection and its working group on passenger vessel fire safety protection.

Accident Data

Several accident data bases were reviewed for the study. Analyses of these data bases were not performed because the criteria for collecting the data and the data elements were not compatible. The data did indicate, however, that collisions, fires, capsizings, and groundings generally accounted for about 70 to 80 percent of the reported accidents.

Safety Board Data.--Analysis of Safety Board data on accidents and incidents involving passenger vessels (domestic and foreign flag) indicates the following:

- From 1974 through 1988 the Safety Board investigated 36 accidents[6] involving 49 passenger vessels. The accidents resulted in 176 deaths and about 364 injuries. Property damage was estimated at more than $68 million. (A list of the accidents is given in appendix B).

- The vessels involved in the accidents fall into the following broad groupings:

Group	Number of Accidents
Domestic passenger (small and large):	26
Passenger vessels	(19)
Ferry vessels	(7)
Foreign flag passenger vessels:	8
Passenger vessels	(7)
Ferry vessels	(1)
State-regulated passenger vessels	2

- The types of accidents for all passenger vessels were as follows:

Types of accident	Number
Collision	12
Capsizing	10
Fire	7
Grounding	4
Near capsizing	1
Ramming	1
Flooding	1

[6]The accidents generally were "major marine casualties" as defined in 49 CFR Part 850: (1) the loss of six or more lives; (2) the loss of a mechanically propelled vessel of 100 or more gross tons; (3) property damage initially estimated as $500,000 or more; or (4) serious threat, as determined by the Commandant (Coast Guard) and concurred in by the Chairman (Safety Board), to life, property, or the environment by hazardous materials.

At the time this report was written, the Safety Board was investigating two other accidents, a collision and a ramming, involving foreign flag vessels that operate from U.S. ports and carry U.S. passengers: the CELEBRATION and the VIKING PRINCESS. The accident of the CELEBRATION resulted in 3 deaths and at least 13 injuries on a Cuban vessel (fig. 1). The Safety Board is also investigating the sinking of the U.S. small passenger vessel COUGAR that resulted in five deaths. The Coast Guard is also conducting an investigation of the EUROPA SUN accident on April 18, 1989, in Madeira Beach, Florida.

Coast Guard Casualty Data.--The Coast Guard maintains a data base (CASMAIN) on accidents of all passenger vessels that occur in U.S. navigable waters.[7] The data base contains 1,923 records for the period 1981-87. These 1,923 records of incidents accounted for 90 fatalities, 297 injuries, and an estimated $75.5 million in property damage. Most data relate to accidents of domestic passenger vessels, but 41 records involving foreign flag passenger vessels operating out of U.S. ports were reported by the following years:

Year	Number of accidents
1981	2
1982	6
1983	2
1984	5
1985	9
1986	10
1987	7

The Coast Guard data indicate that domestic passenger vessels admeasured at more than 100 gross tons were involved in about 457 of the 1,923 records that occurred during the period 1981-87. Most of these reported records (257 of the 457) involved domestic ferries. The other 1,425 records on domestic passenger vessels involved small passenger vessels admeasured at under 100 gross tons.

Coast Guard staff responsible for the data base acknowledged that the number of accidents involving foreign flag passenger vessels operating from U.S. ports and carrying U.S. passengers is not completely known because only accidents occurring within U.S. navigable waters are reported to the Coast Guard. For example, the VIKING PRINCESS accident was reportable because it occurred in U.S. waters. The collision of the CELEBRATION with the CAPITAN SAN LUIS was not considered a reportable accident and the Coast Guard did not investigate the accident, nor were they required to do so, because it occurred in international waters and also because the accident did not involve a U.S. vessel. The CELEBRATION, however, regularly operates from a U.S. port and carries U.S. passengers.

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[7] The definitions of accidents included in the Coast Guard's computerized accident data base are in 46 CFR 4, "Marine Casualties and Investigations."

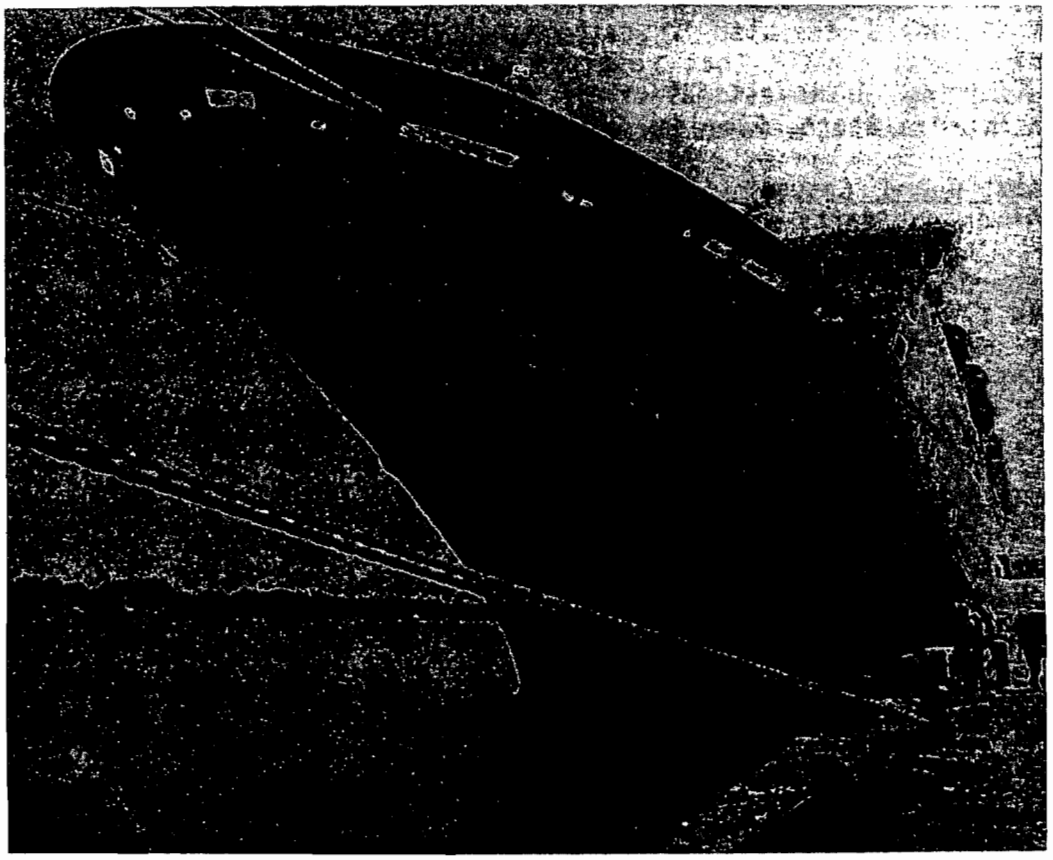

Figure 1.--Damage (estimated at $1 million) to the bow of the CELEBRATION after its collision with the CAPITAN SAN LUIS.

The Coast Guard presented data on accidents of small passenger vessels occurring between 1981 and 1986 in its Notice of Proposed Rulemaking "Small Passenger Vessel Inspection and Certification," issued January 30, 1989. Accidents reported in these data included grounding, loss of maneuvering capability, and occurrence affecting the seaworthiness of a vessel, a loss of life, injury causing incapacitation for more than 72 hours, and accidents resulting in more than $25,000 in property damage (table 1).

Industry Data.--Another data base of primarily domestic small passenger vessel accidents is based on claims data maintained by an insurance company for the National Association of Passenger Vessel Owners. Data summarizing 1,409 claims over a 6-year period (1983-88) were presented at the

Table 1.--Casualties involving small passenger vessels, 1981-86

Nature	Number of casualities	Deaths	Injuries
Casualities involving total loss of a vessel with accompanying deaths and injuries:			
Collision	9	1	2
Sank/broke up/fire (while moored)	8	0	0
Explosion/fire (other than while moored)	8	0	0
Flooding/foundering (8 had wood hulls)	11	9	4
Capsizing	4	0	3
Unknown	2	0	0
Grounding	2	3	0
Total	44	13	9
Casualties materially affecting a vessel (including total loss) with accompanying deaths and injuries:			
Collision	156	2	57
Explosion/fire	74	0	11
Capsizing/foundering/flooding/swamping	128	13	11
Grounding	182	1	9
Material failure to machinery, structure, control and navigating systems	248	1	5
Steering	43	0	0
Disabled	34	0	0
Other	42	6	0
Total	907	23	94

Source: U.S. Coast Guard.

Association's 1989 national conference.[8] Most (69 percent) of the claims occurred on small passenger vessels; many of the claims over $5,000 were for personal injury. The data, however, revealed 436 claims (31 percent) of the following types:

[8] M&M Protection Consultants. "Making safety pay: hints from the insurance industry." Presented at the 1989 national conference of the National Association of Passenger Vessel Owners, January 1989. Marsh and McLennan, St. Louis, MO.

Type of claim	Number	Percent
Collision	183	13
Sinking	56	4
Fire	155	11
Vessel failure (unspecified)	42	3
TOTAL	436	31

Passenger vessel claims data are also collected by the United States based Marine Index Bureau. Since 1937 this organization has served the U.S. maritime industry as the central clearinghouse for records on personal injuries, illnesses, accidents, and claims. At present, 28 companies that operate foreign flag and U.S. passenger vessels are members of the Bureau.

Organization of the Report

The report has three parts, one part for each group of passenger vessels comprising the subject of this safety study. Each part discusses accidents and safety issues relevant only to that group of vessels and the regulations or safety oversight programs that bear on that group. Thus, the part on domestic passenger vessels discusses accidents, safety issues, and the current and proposed Coast Guard regulations that relate to those vessels, except those carrying six or less passengers. The part on foreign flag passenger vessels discusses international safety guidance, the Coast Guard's Control Verification and Examination Program, and safety oversight that relate to those vessels. The part on State-regulated passenger vessels discusses safety oversight programs of some States.

The following safety issues are discussed in Part 1, "Domestic Passenger Vessels":

Licensing of masters of small passenger vessels.--In some accidents, the masters of small passenger vessels had insufficient knowledge of safety regulations. This report reviews the need for licensing improvements.

Training of masters and crewmembers.--Many accidents indicate the need for training and operational and emergency procedures manuals. The report examines training and the need for emergency procedures manuals.

Requirements for basic safety equipment and manning.--Gross tonnage (admeasurement) of a small passenger vessel dictates the emergency equipment requirements. The study discusses admeasurement and its relationship to safety equipment and manning requirements.

Lifesaving equipment requirements.--In some accidents, the vessels lacked sufficient life saving equipment to keep all passengers out of the water. The report examines the Coast Guard's role in determining the need to require lifesaving equipment that keeps people out of the water and lists other reasons for requiring such equipment.

Passenger information and drills.--In many accidents, the vessel did not have an accurate passenger list or count. The study examines the need for passenger information and drills.

Alcohol and drug use by crewmembers.--Rules related to alcohol and drug use have been issued to domestic passenger vessel operations. The report discusses the impact of those rules.

Fatigue.--Fatigue can play a role in performance degradation of masters and crewmembers responsible for the safety of many passengers on vessels. The report addresses this issue based on the Coast Guard's response to a past safety recommendation and other information.

The following safety issues are discussed in Part 2, "Foreign Flag Passenger Vessels":

Safety oversight.--The Coast Guard has authority to examine foreign flag passenger vessels for compliance with international conventions. The report discusses the national law and international requirements giving that authority and the role of the International Maritime Organization (IMO) and the primary safety convention, the "Safety of Life at Sea," known as SOLAS.

Fire protection.--Investigations of some accidents indicate that the international requirements relating to fire protection are not adequate. The report examines past recommendations of the Safety Board to improve international requirements for fire protection equipment and systems, and to improve fire protection for newly designed large, open areas on passenger vessels. Some provisions of the international requirements are open to wide interpretation by the country of registry of the vessel.

Shoreside fire contingency planning.--The Safety Board's investigations indicate a need for better coordination between local fire departments, port administrations, and passenger vessels in port. The report reviews actions taken on past Safety Board recommendations relating to

fire safety at shoreside and discusses practices proposed by the National Fire Protection Association.

Training and drills.--Investigations of some accidents indicate the need for definitive training and drills in firefighting and emergency procedures. The study examines the need for training and drills.

Language barriers.--The report examines language barriers in some accidents.

Accident reporting and investigation.--The report examines the role of the United States in more actively participating in receiving reports and investigating serious casualties involving foreign flag passenger vessels that operate from U.S. ports and carry U.S. passengers.

Interpretation of SOLAS.--The study examines difficulties experienced by the U.S. Coast Guard in verifying safety certificates for some foreign flag passenger vessels because of differences in interpreting SOLAS requirements.

Use of U.S. Subchapter T regulations.--At least one flag Administration is exempting some passenger vessels from all SOLAS requirements and is using U.S. Subchapter T regulations. The study discusses this use of the rules to circumvent more stringent SOLAS requirements.

Location of life jackets.--The location of life jackets in an emergency can be critical to the safety of passengers in an emergency. Two issues are addressed in this report: (1) the need for consistent information provided to passengers on the location of life jackets; and (2) the need for a sufficient number of life jackets at muster stations.

Mass casualty planning.--The report discusses the need for a mass casualty plan in the event of an emergency.

Application of U.S. alcohol and drug rules to foreign flag passenger vessels.--Alcohol/drug rules have been promulgated by the U.S. Coast Guard applicable to marine employers who must apply these rules to foreign citizens who are employed or contracted by a U.S. company. The study discusses this issue.

The following safety issues are discussed in Part 3, "State-Regulated Passenger Vessels":

Minimum standards or guidelines for vessel stability.--U.S. Coast Guard standards for vessel stability do not include State-regulated passenger vessels or some passenger vessels carrying many passengers but not for hire. Stability characteristics were factors in the two accidents investigated by the Safety Board reported in this Part. The study reviews the application of Coast Guard criteria for stability of domestic small passenger vessels to State-regulated passenger vessels.

Safety oversight.--Many States have neither laws nor safety regulations addressing passenger vessels operating exclusively on State waters nor do they have safety programs for these vessels. The report reviews existing programs of two States provided to the Safety Board.

References to supporting material and published literature are given in parentheses throughout the text; the bibliographic citation for each work appears in the References section at the end of the text.

Examples of Passenger Vessel Operations

U.S. passenger vessel operations.--Passenger vessel operations in the United States include ferries, sightseeing/excursion boats, coastal overnight cruises, and dinner cruises.

Most of the U.S. passenger fleet consists of vessels categorized as small passenger vessels.[9] The Coast Guard reports that of the 4,724 small passenger vessels, 1,533 are certificated with coastwise routes; 1,133 with ocean routes; 1,083 with lakes, bays, and sounds routes; and 975 with Great Lakes or river routes. Another 1,300 of the small passenger vessels are used in the offshore oil industry. The Coast Guard estimates the carrying capacity of the total small passenger vessel fleet at 303,000. The M/V PILGRIM BELLE is an example of an "oversized" small passenger vessel (fig. 2).[10]

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[9]A small passenger vessel is a vessel of less than 100 gross tons that can carry more than six passengers for hire. The definition is contained in 46 USC 2101.

[10]The term "oversized" small passenger vessel, for the purposes of this study, denotes a small passenger vessel which admeasured less than 100 gross tons and carries six or more passengers that through various methods, reductions, and exemptions reduces the value of space for admeasurement purposes to sometimes skirt Federal regulatory requirements. Therefore, the true size of the vessel and the risks posed by the larger passenger loadings have not been adequately factored into Federal safety requirements. Admeasurement and its relationship to safety requirements is discussed in chapter 3.

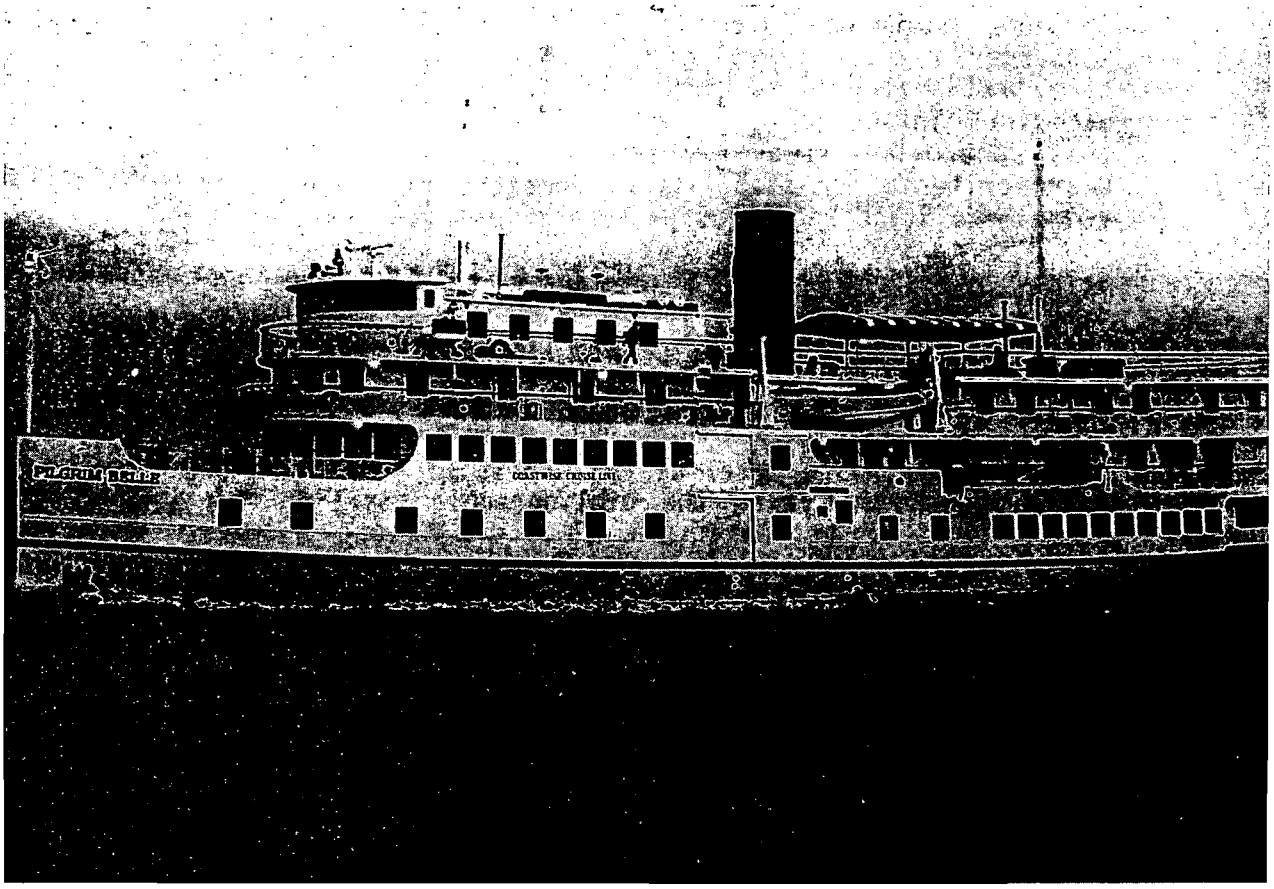

Figure 2.--The M/V PILGRIM BELLE, an example of an oversized small passenger vessel.

The U.S. fleet also includes large passenger vessels (vessels that admeasure more than 100 gross tons). Three--the MONTEREY, CONSTITUTION, and INDEPENDENCE--operate in the Hawaiian Island cruise trade; they are similar in size (more than 5,000 gross tons) to foreign flag passenger vessels. Additionally, the State of Alaska operates some large passenger vessels, and the MISSISSIPPI QUEEN and DELTA QUEEN operate on the Mississippi River. Most large U.S. passenger vessels provide excursions of short durations, and most generally operate close to shore. Many of these vessels can carry more than 1,000 passengers; for example, the DAY LINER, operating from New York City, carries 3,252 passengers, and the GENERAL JACKSON, operating from Opryland, Tennessee, carries 1,200 passengers (fig. 3).

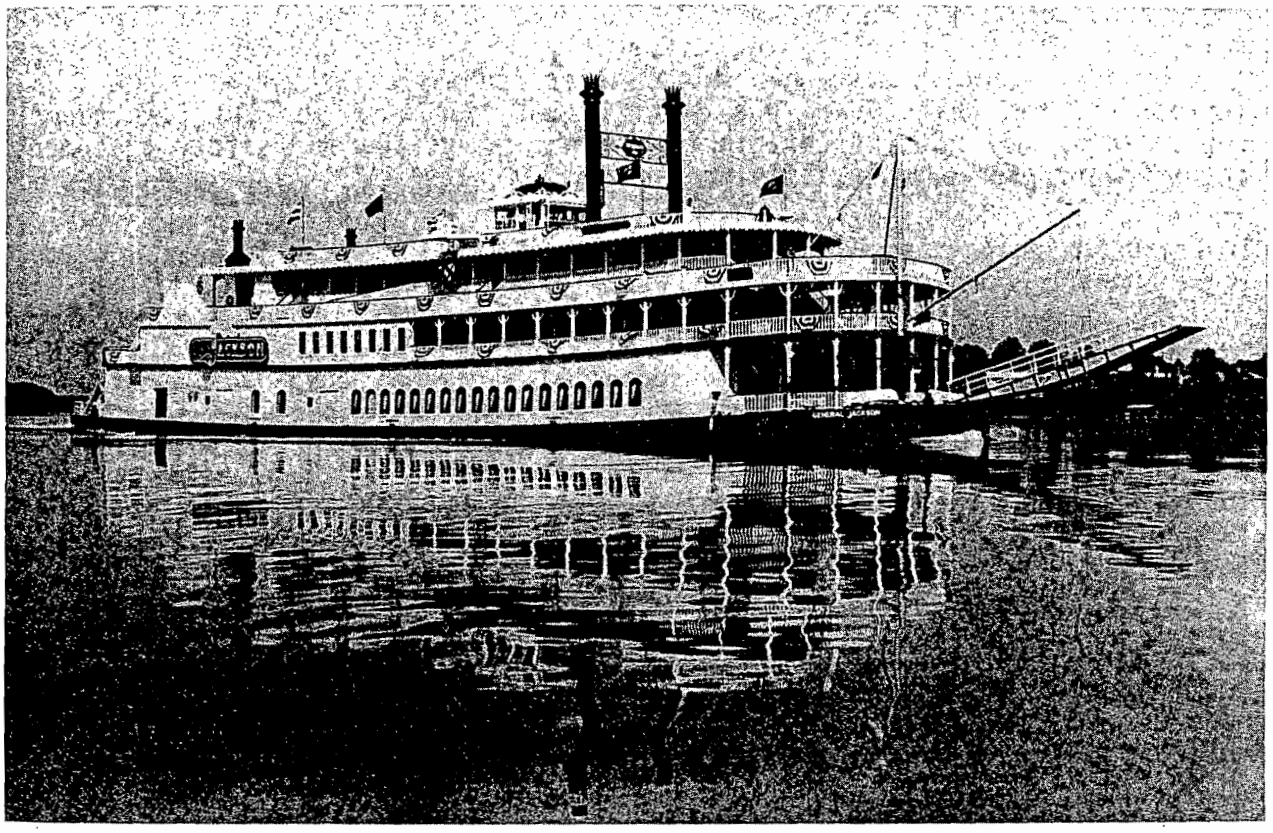

Figure 3.--The GENERAL JACKSON, an example of a large U.S. passenger excursion vessel.

About 270 ferries operate in the United States (Wright 1987). New York City and the State of Washington have the largest ferry vessel operations. The fleet of New York City ferries carries 3,000-6,000 passengers per rush-hour trip between Staten Island and the Battery on Lower Manhattan; more than 20 million passengers use the Staten Island ferries each year. In Seattle, a fleet of 22 ferries plays an integral role in the commuter transportation system of Washington State. In 1987, the fleet carried 18 million passengers and 7 million motor vehicles. The Seattle ferries range in gross tonnage from slightly less than 500 gross tons to 3,246 gross tons. The smaller ferries carry 40 motor vehicles and 200 passengers; the larger ferries carry 206 motor vehicles and 2,000 passengers. Other large, notable ferry operations are in and around the Boston area and the Mississippi River. The estimated number of passengers using ferry services in the United States exceeds 50 million each year.

In addition to the traditional displacement hull passenger vessels, the U.S. industry is beginning to use new types of passenger vessels. These new types include dynamically supported craft (DSC) such as hydrofoils, air-

cushioned and surface effect vessels, and any high speed watercraft that meet IMO's "Code of Safety for Dynamically Supported Craft"; small waterplane area twin hull (SWATH) vessels (fig. 4); and large sailing passenger catamarans (two hulls). Tourist passenger submersibles (submarines) have also been introduced; the Coast Guard has certificated four such vessels. Passenger submersibles may not fit certain regulatory categories for safety equipment requirements; for example, life preservers.

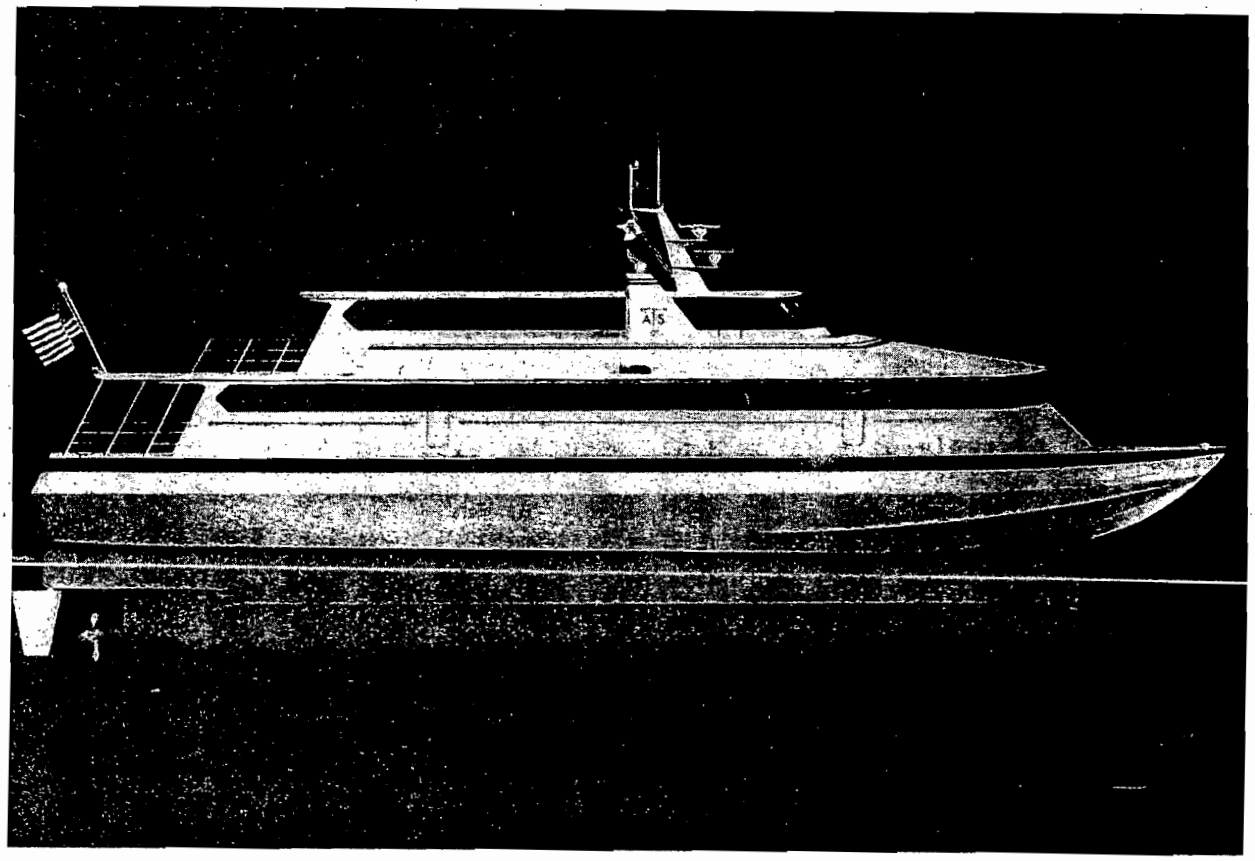

Figure 4.--An example of a proposed passenger vessel known as a SWATH (small waterplane area twin hull).

Because of their unique designs, however, passenger submersibles and other new types of passenger vessels may require unique safety regulations.[11] The Safety Board believes that the Coast Guard should assess the applicability of present safety regulations to these vessels.

Foreign flag passenger vessel operations.--Foreign flag passenger vessels operating from U.S. ports are of three types. First, there are luxury passenger vessels that accommodate up to 2,600 passengers and crews of 400-500 (fig. 5). These vessels undertake voyages to many international ports and may spend up to 3 months on such voyages.

The second type comprises passenger vessels on "short, international" voyages (a voyage of less than 600 miles) and "cruises to nowhere." These vessels usually operate from U.S. ports on daily schedules. The daily voyages offer food and entertainment, but the primary purpose appears to be open gambling after the vessel crosses the U.S. territorial water limits. These vessels accommodate up to 1,500 passengers and crews of 200-300.

The third type comprises small foreign flag vessels (admeasurement less then 100 gross tons under U.S. regulations) on "cruises to nowhere" that previously were documented and originally fell under the U.S. regulations for domestic small passenger vessels. Vessels once used in U.S. offshore oil fields then converted to passenger vessels carrying foreign flags, such as the Panamanian vessels EUROPA STAR and the EUROPA SUN operating out of Madeira Beach, Florida, are examples of these types. These vessels can be exempted from SOLAS standards for passenger vessels by the flag Administration. The U.S. Coast Guard-Miami indicates that more small foreign flag passenger vessels like the EUROPAs plan to enter the cruise-to-nowhere trade. The Coast Guard is now applying the regulations of U.S. Subchapter T for small passenger vessels rather than international[12] SOLAS requirements to these foreign flag passenger vessels. (See chapter 12 for further discussion of this safety issue.) These vessels may carry up to 600 passengers.

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[11] Congress recognized submersible vessels as a new area for safety concern in the "Omnibus Budget Reconciliation Act of 1986," Public Law 99-509, October 21, 1986, and provided authority to the Secretary of Transportation to "prescribe regulations...to provide a minimum level of safety" and "...consider factors relevant to...structure, stability, and watertight integrity" (Part C, "Load Lines of Vessels"; Chapter 51, "Load Lines"; Section 5110, "Submersible Vessels").

[12] U.S. Coast Guard letter reference 16711/31. January 27, 1989. 2 p. Washington, D.C.

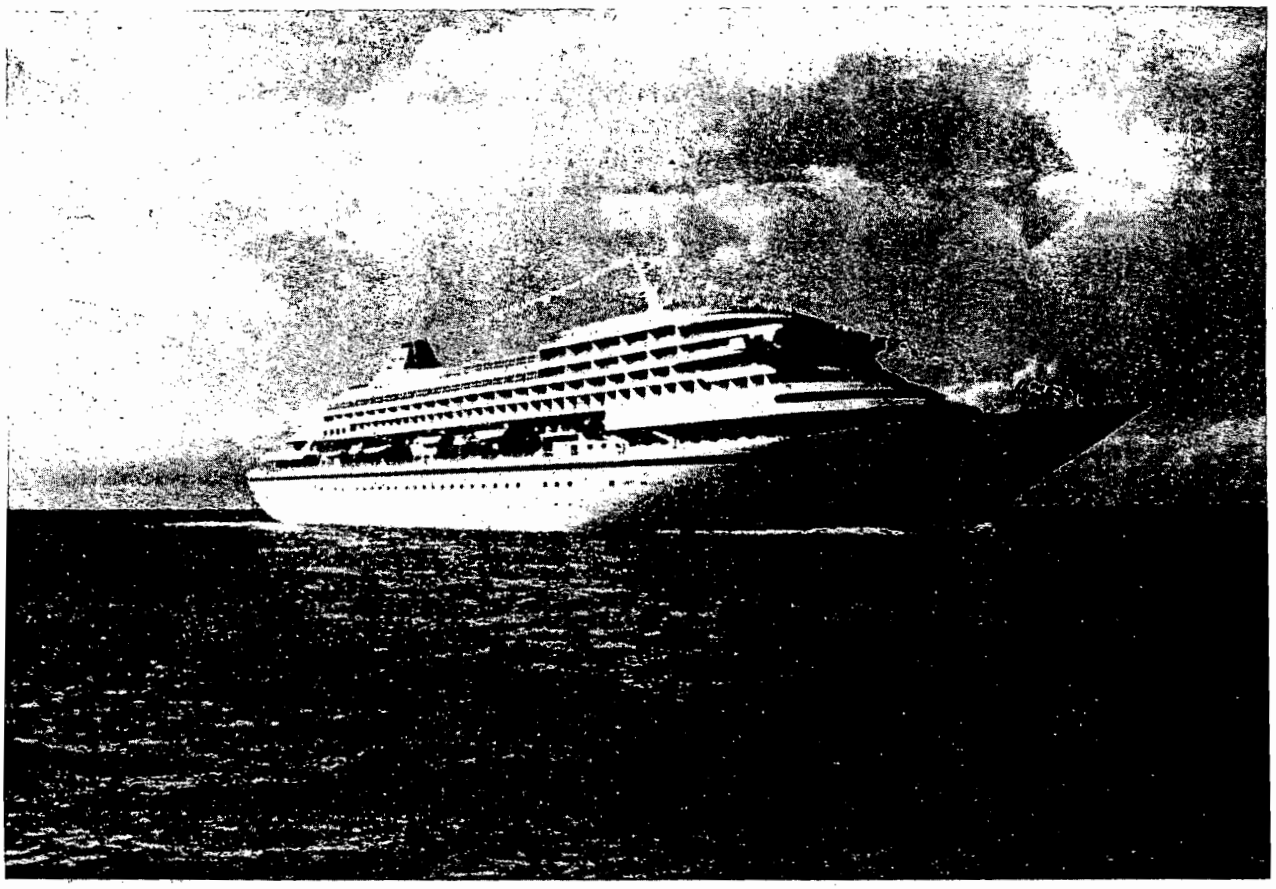

Figure 5.--The M/V ROYAL VIKING SUN, an example of a large foreign flag passenger vessel operating in the U.S. cruise market.

The number of foreign flag passenger vessels regularly operating from U.S. ports is neither clearly nor concisely documented in a readily available source. Port administrators for 11 locations provided the number of foreign flag vessels admeasuring more than 5,000 gross tons that regularly call at their ports:

Region and port	Number of vessels
South Atlantic Coast:	
Port Canaveral	4
Palm Beach	2
Port Everglades	23
Miami	21
San Juan	15
North Atlantic Coast:	
New York City area	5
Gulf Coast:	
Tampa	4
New Orleans area	1
Pacific Coast:	
San Diego	1
Los Angeles	3
San Francisco	2
TOTAL	81

These 81 vessels operating regularly from U.S. ports comprise about 80 to 85 percent of the world fleet of foreign flag passenger vessels admeasuring over 5,000 gross tons, which is estimated to be between 95 and 100 vessels. More than half the world's fleet of large foreign flag passenger vessels operate from Florida in the Caribbean, Bahamas, and cruise-to-nowhere trade. There are no U.S. large passenger vessels operating in this trade.

According to a survey conducted by Det Norske Veritas, the Norwegian classification society, the worldwide cruise trade of large passenger vessels is booming, and at least 20 new passenger vessels are under construction or on order in shipyards around the world. Most of these vessels will enter the U.S. cruise market. Some of these vessels will exceed 70,000 gross tons and will carry up to 2,600 passengers. The U.S. Coast Guard is expecting to examine an additional eight new foreign flag passenger vessels in 1989 in Miami alone.

State-regulated passenger vessel operations.--Many vessels in the United States operate on State waters (non-Federal waters) or do not carry passengers for hire. These operations are basically of two types: large recreational passenger vessels, such as the M/V SCITANIC (NTSB 1985b), and commercial operations, such as the S/B WHIPPOORWILL (NTSB 1979a). These

vessels are not subject to the Coast Guard's regulations for passenger vessels because they operate on State waters (non-Federal waters), or because they do not carry passengers for hire. They are, however, subject to certain recreational boating safety requirements of their States. Generally the requirements specify that the vessel must be registered and have safety equipment on board, such as personal flotation devices for each person, fire extinguishers, navigation lights, a whistle, and a bell. Requirements for vessel stability or manning are seldom specified by State authorities.

One safety program for State-regulated passenger vessels reviewed during the Safety Board's study was that of the New York State Office of Parks, Recreation, and Historic Preservation. There are 20 passenger vessels operating in the State on non-Federal waters, notably, a fleet of vessels on Lake George that can carry from 150 to 550 passengers each. A new vessel under construction for Lake George, the LAC DE SAINTE SACREMENT, will be the largest State-regulated passenger vessel in the United States, carrying 1,500 passengers. Programs in some other States also address passenger vessel safety requirements.

PART 1

DOMESTIC PASSENGER VESSELS

CHAPTER 1

LICENSING OF MASTERS OF SMALL PASSENGER VESSELS

Domestic small passenger vessels, which admeasure less than 100 gross tons and carry more than 6 passengers for hire, currently carry up to 1,500 passengers at one time and pose substantial demands on masters in the event of an emergency. Excluded from this study are small passenger vessels that admeasure less than 100 gross tons and carry six or fewer passengers. In its report on the accident of the PILGRIM BELLE, the Safety Board stated its position that masters of small passenger vessels--in particular, masters who operate small passenger vessels that have overnight accommodations for 50 or more passengers--should be required to meet the higher qualification requirements for masters of large passenger vessels, including examination on particular regulations about subdivision, damage stability, structural fire protection, and electronic navigation (NTSB 1986a).

Historically, the ocean operator license required for masters was intended for daily excursion and charter fishing vessels. Small passenger vessels carrying large numbers of passengers were not contemplated. The original intent of the "Small Passenger Vessel Act of 1956" (Public Law 84-519) was to improve the safety of vessels 65 feet or less in length, admeasuring more than 15 but less than 100 gross tons, and carrying more than six passengers; for example, fishing party vessels, small excursion/sightseeing vessels, and small ferries. These operations were principally owned by individuals or families, and often operated on tight budgets. In 1963, the scope of the regulations was broadened to include vessels more than 65 feet in length, admeasuring less than 100 gross tons, and carrying one or more passengers (28 CFR Part 9733). The ocean operators license originally required by the Coast Guard accepted experience on small vessels, such as charter fishing vessels less than 65 feet, and required the applicant to spend a short period of service on this smaller vessel for an individual to qualify for an ocean operators license. When the ocean operators license was obtained, it was valid on any small passenger vessel less than 100 gross tons, regardless of the complexity of the operation, number of passengers, or safety equipment on board.

Since the requirements for the ocean operator's license were established, the small passenger vessel industry has expanded to include small passenger vessels that have accommodations for 50 or more overnight passengers, excursion vessels, dynamically supported craft, and other new types of vessels such as SWATH and submersibles. Some of these vessels have placed an increased responsibility on masters to ensure passenger safety, particularly because of the increased number of passengers on board, which can be more than 1,500. The increased responsibility for large numbers of passengers calls for a master to have skills in passenger orientation (the ability to transmit to passengers necessary safety information in an emergency), emergency drill training for his or her crew, and a clear understanding of emergency procedures in the event of fire, hull damage, or the need to quickly and efficiently abandon ship. In its investigation of the PILGRIM BELLE accident, the Safety Board concluded that U.S. Coast Guard requirements for master of small passenger vessels that have overnight

accommodations for 50 or more passengers are not sufficient because they do not test the applicant's knowledge of regulations concerning lifesaving equipment, structural fire protection, damage stability, and proper use of electronic navigation equipment covered by Subchapter H.[13] Therefore, the Safety Board recommended in 1986 that the U.S. Coast Guard:

M-86-65

Require the masters of all passenger vessels that have overnight accommodations for 50 or more passengers to pass an examination on applicable sections of 46 CFR Subchapter H regulations, including subdivision, damage stability, structural fire protection, and electronic navigation.

In its response on February 28, 1987, the Coast Guard concurred with the intent of the Safety Board's recommendation and advised that revisions to the licensing and examination sections of Subchapter T, "Small Passenger Vessels," were contemplated under proposed rulemaking action, "Licensing of Maritime Personnel," Docket CGD 81-059. Based on the Coast Guard response and the issuance of new Safety Recommendation M-89-111, the Safety Board classifies this recommendation as "Closed--Superseded."

On June 22, 1987, two small passenger vessels collided in Lower New York Bay during fog (NTSB 1988a). The JACK W, a 110-foot, aluminum ex-crew boat, was southbound from Manhattan to Highlands, New Jersey, with 126 passengers aboard. The JAMEY DOWNEY, a similar, 99-foot vessel, was northbound with two passengers aboard. The operators of the vessels established a meeting agreement by VHF radio before they came in sight of one another. When they were about 150 feet apart, the JAMEY DOWNEY was sighted directly in the path of the JACK W. The resulting collision left 17 passengers injured. The Safety Board determined that both operators failed to properly monitor their radars after establishing a meeting arrangement and before sighting each other visually. The Safety Board concluded that safety would be improved if the masters of radar-equipped passenger vessels were qualified radar observers, and in 1988 recommended to the U.S. Coast Guard:

M-88-9

Require that operators of all inspected radar-equipped passenger vessels under 300 gross tons be qualified as radar observers.

On July 29, 1988, the Coast Guard concurred with the intent of this recommendation and said it would review the need for radar observer status aboard small passenger vessels. The Safety Board classified the recommendation as "Open--Acceptable Action" pending completion of Coast

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[13] Subchapter H, "Passenger Vessels," is in 46 CFR Parts 70-89. These regulations generally are applicable to all U.S. flag vessels that admeasure 100 gross tons or more.

Guard action. Safety Recommendation M-88-9 is being reiterated because the Safety Board continues to stress that masters of passenger vessels should be qualified as radar observers as a license requirement.

The Coast Guard issued a Notice of Proposed Rulemaking (NPRM) on August 8, 1983 (48 FR 35920) and a supplement NPRM on October 24, 1985 (50 FR 43316) to amend and simplify the licensing structure.

The Safety Board's comments on the NPRM were forwarded to the Coast Guard's Marine Safety Council on February 14, 1986. The comments addressed the following concerns:

- The need for deck officers whose license permits him or her to operate a small passenger vessel of less than 100 gross tons carrying more than six passengers for hire to be qualified in first aid or cardiopulmonary resuscitation (CPR);

- The need for firefighting training requirements to extend to deck officers in inland as well as near-coastal and ocean categories for any license that allows operation of vessels under 100 gross tons carrying six or more passengers;

- The need for licensed operators of all small, radar-equipped passenger vessels carrying more than six passengers for hire to have a radar endorsement on the license;

- The need for masters of small passenger vessels to be examined on all subjects concerning passenger ship regulations, such as damage stability, structural fire protection, and electronic navigation.

The Coast Guard's final rule "Licensing of Maritime Personnel" was issued on January 4, 1989 (54 FR 125).[14] Some examination areas, such as the ability to use radar, were are not covered in the final rule; the Safety Board continues to believe that safety should be improved by including in the license examination for masters of small passenger vessels, the following areas:

- Radar observer expertise. Many small passenger vessels admeasuring less than 100 gross tons and carrying more than six passengers for hire operate in highly congested waters, often with unlimited visibility. A radar observer

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[14]The final rule comprises 33 CFR Part 155 and 46 CFR Parts 1, 10, 12, 15, 26, 30, 31, 151, 175, 185, 186, and 187.

certificate should be required for operators of such vessels.

- Damage stability. Examination of this area should not be limited to masters of vessels more than 100 gross tons, particularly if the smaller vessels carry six or more passengers.

- Knowledge of emergency procedures for grounding and loss of steering.

- Knowledge in crew training, personnel management, and shipboard organization. Masters must ensure that all crewmembers are familiar with their duties and can sufficiently handle any emergency so that the crew can make decisions about evacuating passengers and have skills to control damage or fire.[15]

The Safety Board believes that all masters of small passenger vessels that carry more than six passengers for hire should have an indepth knowledge of vessel trim and damage stability; the use of emergency equipment; and how to use their firefighting systems. The Safety Board also believes that masters should conduct emergency drills with their crews and should keep a record of such activities, noting areas needing improvement. This record would be used to ensure that drills were conducted as required by regulations.

The Coast Guard's regulatory structure for licensing masters and mates of small passenger vessels continues to be based on gross tonnage and intended route of service. The Safety Board believes that license requirements for masters and mates of passenger vessels should not only consider the (true) size of the vessel but should also reflect the number of passengers carried, type of vessel, and type of operation. Training requirements would be important elements of the licensing program and are discussed in the next chapter.

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[15] This area would apply to oversized small passenger vessels. Most small passenger vessels only have a crew of two: one operator and one deckhand.

CHAPTER 2

TRAINING REQUIREMENTS FOR MASTERS AND CREWMEMBERS

The Safety Board has repeatedly addressed the need for training masters and crewmembers. In several accident reports, the Safety Board addressed the training issue in two ways: through Coast Guard regulations and through passenger vessel companies (NTSB 1984, 1986a, 1986b, 1988a).

Coast Guard Regulations

The sole purpose of the Coast Guard's manning requirements is to ensure that each vessel has sufficient crew and licensed operators for the proper navigation and operation of the vessel with "due regard...given to the need for protection of the vessel and passengers during emergencies."[16] Yet the Coast Guard has not established qualification and training standards for deckhands on small passenger vessels; consequently, persons unfamiliar with safety procedures, vessel operations, and emergency equipment may serve on small passenger vessels. This lack of standards causes concern, even for the smallest passenger vessel. For example, if the master becomes incapacitated, it may fall to a deckhand to take control of the vessel. If the deckhand has no training, the safety of the vessel and the passengers is likely to be in jeopardy.

The Safety Board believes that deckhands employed on small passenger vessels should meet specified qualification requirements, with proper training in emergency procedures, use of safety equipment, and firefighting; if the deckhand is called on to assume navigation responsibilities, it is even more important that the Coast Guard require qualifications and training related to those responsibilities.

The Safety Board report on the collision of the two commuter ferries JACK W and the JAMEY DOWNEY addressed the need for deckhands on ferries to meet qualification standards, particularly because one crewmember on board the JAMEY DOWNEY had worked only 2 full days with another experienced deckhand before assuming duties on the vessel. A deckhand cannot be fully trained on use of emergency and lifesaving equipment and how to safely evacuate passengers for emergencies by on-the-job training of 2 days. In its report on the accident, the Safety Board referred to its earlier investigation of the capsizing of the U.S. charter passenger fishing vessel FISH-N-FOOL (NTSB 1987c) and the recommendation issued in 1987 from that report to the Coast Guard stated:

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[16] See 46 CFR 186.01-5, "Intent," October 1, 1987, referenced in the Safety Board's accident report on the FISH-N-FOOL (NTSB 1987c). 46 CFR 186 subsequently was moved to 46 CFR Part 15, revised October 1, 1988, and the language in the "Intent" paragraph was deleted.

M-87-115

Amend 46 CFR Part 187 to establish qualification standards for deckhands on small passenger vessels.

In a letter dated May 18, 1988, the Coast Guard said that it "concurs with this recommendation in part. A regulatory project concerning manning of small passenger vessels and the qualifications of the crews has been initiated by the Coast Guard." The Coast Guard, however, alluded to the lack of specific statutory authority in this area. The Safety Board classified the recommendation as "Open--Acceptable Action," based on the Coast Guard's plan to take corrective action. Because the Coast Guard has not yet taken action, Safety Recommendation M-87-115 is being reiterated as a result of this safety study to reemphasize the Safety Board's concern that qualification standards are necessary for deckhands on small passenger vessels.

In its reports on the accidents involving the U.S. passenger vessels YANKEE and the MISSISSIPPI QUEEN (large passenger vessels over 100 gross tons), a different training concern emerged: weaknesses in the training and emergency procedures requirements set forth in 46 CFR Part 78.13, "Station Bills" (NTSB 1984, 1986b). Coast Guard regulations require that a station bill be prepared by the master of the vessel, setting forth the duties and duty station of each member of the crew for various emergencies. This subpart of the passenger vessel regulations defines the particular emergencies for which the vessel's crew should be prepared. However, the Coast Guard provides no criteria to determine crew proficiency for emergencies or the standards of training necessary to achieve that proficiency. The Safety Board recommended in 1984 and in 1986, as a result of the YANKEE and MISSISSIPPI QUEEN accidents, that the Coast Guard:

M-84-26

Require that passenger vessels subject to 46 CFR Subchapter H incorporate in station bills the details of actions to be taken by the crew to prepare the passengers for various shipboard emergency conditions.

M-86-73

Require comprehensive training of passenger vessel crews in emergency procedures that includes demonstrating proficiency in the use of emergency equipment.

The Safety Board is concerned that station bills required for large passenger vessels are not also required for the small passenger vessels. Some of these vessels may carry more passengers than many large passenger vessels carry, and the Safety Board believes that they should also comply with provisions similar to those required in 46 CFR Part 78-13, Subchapter H, "Passenger Vessels." This would require that a station bill be prepared by the master of the vessel, setting forth the duties and duty station of each member of the crew for various emergencies.

The Coast Guard did not agree with Safety Recommendation M-84-26 because, it said, current regulations already required that station bills reflect what the Safety Board had recommended. In the accident prompting the recommendation, the passenger vessel company had not met Coast Guard standards. The Safety Board classified the recommendation "Closed--Reconsidered" on July 22, 1985.

The Coast Guard concurred with M-86-73. The December 1, 1986, response indicated that new, proposed training and drill regulations would address crew proficiency in the operation of equipment. The Coast Guard promised regulatory action in 1987, but as of this writing, it has not occurred. Based on the lack of action, this safety recommendation is now classified as "Open--Unacceptable Action." The Safety Board believes that Safety Recommendation M-86-73 must be met by the Coast Guard and therefore the recommendation is reiterated.

Passenger Vessel Companies

The Safety Board also has issued recommendations related to crew training directly to some passenger vessel companies and owners. As a result of the MISSISSIPPI QUEEN accident, for example, the Safety Board issued Safety Recommendations M-86-87, asking the Delta Queen Steamboat Company to develop a comprehensive emergency operations and procedures manual, and M-86-88, to develop and administer a training program for company vessel crews in emergency procedures that include demonstrating proficiency in the use of emergency equipment. These recommendations were classified as "Closed--Unacceptable Action" because the company never responded. Following the JACK W accident, the Safety Board recommended that the Direct Line Commuter Service, Inc., develop a company operating manual to include such subjects as appropriate navigation rules, emergency procedures, adverse weather procedures, and communication requirements (Safety Recommendation M-88-13). Additionally, the Safety Board recommended that the company require its Coast Guard-licensed operators to attend radar training and to obtain a radar observed endorsement (Safety Recommendation M-88-14). The Direct Line Commuter Service replied favorably to the Safety Board's recommendations and, based on the company's response, Recommendations M-88-13 and M-88-14 have been classified as "Closed--Acceptable Action."

Comprehensive manuals for emergency operations and procedures is one approach to improve safety operations of passenger vessels. During the Safety Board's interviews with passenger vessel operators and masters, the need for operational and emergency procedures manuals and corollary training for crewmembers was discussed. There was general agreement that comprehensive manuals addressing safety operations would provide each crewmember with his or her duties and responsibilities before an emergency arises.

Opryland USA, the corporation operating the showboat GENERAL JACKSON, provided to the Safety Board copies of its safety training program and manuals for review. The diesel electric stern paddle wheel vessel is 274 feet long, admeasured 1,489 gross tons (a large passenger vessel), and has a

crew of 157. The vessel operates as many as five cruises per day and can carry up to 1,200 passengers. The company issues a "General Jackson Safety Manual" to each new employee. Employees are required to attend a 4-hour training session and to pass a safety orientation test before they can work on the vessel. Additionally, the master of the GENERAL JACKSON provides to each employee a pocket-size manual and a plastic wallet-size emergency signal card that the employee must possess whenever working on the vessel. The senior safety officer of Opryland USA and the master of the GENERAL JACKSON indicated that the crew meets daily with the master to review safety procedures.[17]

Operators and owners of some other passenger vessels provided or described to the Safety Board their documentation of operational and emergency procedures and crew training. For example, the Belle Carol Riverboat Company, operating the 125-foot diesel electric stern paddle wheel vessel MUSIC CITY QUEEN (a small passenger vessel) in Nashville, Tennessee, provided its training manual. Although not as comprehensive as the manual for the GENERAL JACKSON, it does cover the areas necessary for the crew to respond in an emergency. The general manager of the company indicated that the company is concerned about fire safety, and drills are held on man-overboard procedures and firefighting.[18]

Other companies interviewed during the study indicated the following:

- The Boston Harbor Commuter service, which operates small passenger vessels, did not have an operation and emergency manual; the company president said he planned to complete such a manual as soon as possible.[19] (On September 23, 1989, Boston Harbor Commuter Service provided its new training manual to the Safety Board.) Crew training, he said, was essential for safe operations.

- The general manager of the SPIRIT OF WASHINGTON (a small passenger vessel) operating in Washington, D.C., was completing an operational and emergency manual and supported the type of crew training areas recommended in this

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[17] Interviews with manager of safety and security, Opryland USA, and general manager, GENERAL JACKSON, November 10, 1988; and captain of the GENERAL JACKSON, January 8, 1989.

[18] Interview conducted in Nashville, Tennessee, on November 11, 1988.

[19] Interview conducted at Rowes Wharf, Boston, Massachusetts, on November 29, 1988.

study.[20] He said the company holds monthly meetings at which safety and emergency issues are discussed with all employees.

- The executive vice president of BB Riverboats of Covington, Kentucky, provided their "Vessels Training Manual" that addresses such areas as rules of the road, medical emergencies, fire prevention and control, standard operating procedures for emergencies, and use of marine radios. All crewmembers must read each general section and sign that they understand each section. Additionally, the manual contains a specific section on each vessel that crewmembers assigned to that vessel must understand and sign. BB Riverboats tests employees in five major areas: rules of the road, bow watch, certificate of inspection, fire safety, and first aid. This company operates seven small passenger vessels, and the executive vice president strongly supports the need for each employee to understand what the company expects of its crewmembers and what the crewmember can expect from the company.[21]

At the 1989 conference of the National Association of Passenger Vessel Owners (NAPVO), the insurance industry presented the elements of a successful loss-control management system for use by NAPVO members. Elements of the system are management commitment, hazard assessment and control, safety planning, rules and work practices, and safety and health training (see footnote 8).

Because of NAPVO's view that training is essential for all passenger vessel operations, its Safety and Training Committee developed a safety program and manual for use by NAPVO members. The draft manual was reviewed by the Safety Board in March 1989. The intent of this manual is to address the safety program needs of small passenger vessels. The manual provides a framework for improving safety guidance for small passenger vessels with no overnight accommodations that operate primarily on limited or sheltered routes. For the manual to be used by small passenger vessels that admeasure less than 100 gross tons and have overnight accommodations for 50 or more passengers, it would need additional safety program information such as damage stability, actions to immediately notify rescue authorities, and duties of each crewmember in an emergency when operating offshore in ocean or coastwise routes. The NAPVO recently released the final manual to its

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[20] Interviews conducted in San Diego, California on January 9, 1989, and in Washington, D.C., on February 20, 1989.

[21] Interview conducted in Washington, D.C., on August 18, 1989, and review of BB Riverboats' "Vessels Training Manual" received August 22, 1989.

membership (National Association of Passenger Vessel Owners 1989.) One of the major purposes of this manual is to provide a format for passenger vessel owners and operators to develop their own formal written company training program to improve the safety level of operation and preparation for emergencies.

Because crewmembers must understand minimum safety operational and emergency procedures, the Safety Board believes that the Coast Guard should provide the necessary guidance to ensure a minimum level of standards for crew training before crewmembers are put in emergency situations. The minimum areas that should be addressed include appropriate rules of the road and navigation principles (for crewmembers who may have to assume a vessel's command), emergency procedures (firefighting, man-overboard, and other drills), communication requirements, and the use of critical lifesaving equipment. The safety training should be commensurate with the crewmembers' responsibility on a vessel.

Further, the Safety Board believes that all passenger vessel owners and operators should provide an operational and emergency manual explaining the company's policies and procedures to crewmembers so that they have basic written guidance in those areas critical to their own and to their passengers' safety and survival, and so that the actions they are expected to take in an emergency are known and not expected to be learned during an emergency.

Safety training should be reinforced by owners, masters, and operators of all passenger vessels, with periodic drills in the use of safety equipment before it must be deployed in an actual emergency; a record should note the date and time such training drills were conducted. Also, firefighting drills and man-overboard drills should be part of a rigorous training program, and the vessel's record should reflect the date and time of such drills. Maintaining a record of such events is important to keep a proper recording of drills and other safety-related actions. The Safety Board believes that if masters knew that records would be open for inspection by the Coast Guard, there would be an incentive for accuracy and completion of required training drills.

CHAPTER 3

ADMEASUREMENT AND ITS RELATIONSHIP TO SAFETY EQUIPMENT AND MANNING REQUIREMENTS

To admeasure a vessel is to determine the internal volume or cargo-carrying capacity of a vessel under specified rules. The Safety Board has been concerned about the use of various admeasurement exemptions, reductions in tonnage, and other techniques to sometimes skirt Federal regulatory safety requirements. Historically (since 1854), the unit of admeasurement used in the United States is that 1 gross ton is equivalent to 100 cubic feet of hull volume.

In its report on the PILGRIM BELLE accident, the Safety Board pointed out that admeasurement, under U.S. regulations (46 CFR Subchapter G), exempted all crew and passenger spaces above the main deck on small passenger vessels like the PILGRIM BELLE. Because the volume of a space for admeasurement purposes includes only the volume inside the structural members, naval architects have reduced the volume below the main deck by (1) introducing large bolted plates, called tonnage openings, in deck houses and bulkheads; and (2) specifying construction methods that include deep and wide frames, intercostal hull framing, and ballast tanks. All of these methods result in increased vessel weight, loss of usable space, loss of hull strength, and possible loss in stability (DeJong 1988).

Until 1982, each country and the Panama and Suez canals had its own admeasurement regulations. On July 18, 1982, the 1969 International Convention on Tonnage Admeasurement of Ships (ITC) went into effect for most countries of the world. The United States ratified this convention on May 5, 1983; however, national legislation to fully implement the convention awaits the results of a Department of Transportation study mandated by Section 5103 (g) of Public Law 99-509. In passing this law, Congress supported the Coast Guard contention that the U.S. tonnages currently assigned to many vessels are unreliable as an index of vessel size. The Coast Guard, however, believed that neither Congress nor the Department of Transportation wished to fully impose a tonnage convention system that would bring more vessels under regulation or subject currently regulated vessels to additional requirements.[22] The legislation, therefore, included an alternate regulatory measurement to "grandfather" most domestic U.S. vessels but did not include foreign flag vessels.

The Congress, mindful that measuring vessels under two systems would be cumbersome and costly, asked the Department of Transportation to complete its study of this issue by July 18, 1990. The final study will include:

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[22] U.S. Coast Guard. 1988. Interim progress report: study of the use of vessel tonnage in U.S. laws and regulations. Washington, DC. 16 p. Submitted to Congress.

- An analysis of the number and types of vessels that would become subject to additional laws or more stringent requirements by applying the 1969 International Tonnage Convention;

- A determination of the extent to which the tonnage thresholds in U.S. laws would have to be changed to protect vessels from these laws, if the ITC system was applied;

- A recommendation of the levels to which the tonnage thresholds in U.S. laws should be raised if a complete conversion to the ITC system is made.

One section of the study will look at tonnage comparisons. An initial observation provided in the interim report to Congress indicated that passenger vessels are the most inconsistent vessel type in both tonnage-to-length ratio and in tonnage comparison (U.S. Coast Guard 1988). Convention gross tonnages exceed the U.S. gross tonnage by a range of 49 to 2,350 percent. Convention net tonnages exceed the U.S. net tonnages by a range of 75 to 400 percent. These variances are due to the sophisticated tonnage reduction techniques used by owners and naval architects in the U.S. passenger vessel service.

The Safety Board strongly believes that the safety of passengers and safety equipment requirements, manning, and construction for passenger vessels should not be based on U.S. gross tonnage. Clearly, the ITC was to establish a uniform and realistic measurement of the volume of a vessel. For example, the PILGRIM BELLE admeasured only 96 gross tons under the U.S. system. Using the 1969 convention, the same vessel would admeasure over 1,600 gross tons. In the United States, a vessel that admeasured 1,600 gross tons would have to meet more stringent safety equipment requirements and would be equipped with a radar system, gyrocompass, magnetic compass, fathometer, and various marine publications and tables. Additionally, construction, lifesaving equipment, firefighting equipment, manning and licensing standards of the PILGRIM BELLE would be at a considerably higher level if the vessel had been admeasured at 1,600 gross tons. The Safety Board believes that for domestic passenger vessels, the number of passengers should be the critical factor in determining safety requirements rather than gross tonnage determining the safety requirements, particularly because some small passenger vessels admeasured at under 100 gross tons can carry more than 1,500 passengers.

As a result of these concerns, the Safety Board issued the following recommendation in 1986 from the PILGRIM BELLE report to the Coast Guard:

M-86-64

Require all passenger vessels that have overnight accommodations for 50 or more passengers to meet the

construction, licensing, and manning requirements for a passenger vessel over 100 gross tons.

The Coast Guard responded on October 2, 1987, that a regulatory project would address the Safety Board's concern in part. The Coast Guard disagreed that oversized small passenger vessels (see footnote 10) such as the PILGRIM BELLE needed to meet the more stringent construction requirements of Subchapter H, "Passenger Vessels" (passenger vessels over 100 gross tons). The Coast Guard, however, acknowledged that the proposed regulatory project would address manning and qualifications of personnel assigned to small passenger vessels. Based on this response, the Safety Board classified the recommendation as "Open--Acceptable Action" pending completion of the Coast Guard's regulatory project, which is now scheduled for late 1989 or early 1990. Safety Recommendation M-86-64 is being reiterated because of the Safety Board's concern about the amount of time with no action, and the recommendation is being reclassified as "Open--Unacceptable Action."

The 1987 collision of the two commuter ferries JACK W and the JAMEY DOWNEY in Lower New York Bay during conditions of fog prompted the Safety Board to again address admeasurement. Currently, radar equipment is not required for passenger vessels of less than 1,600 gross tons. Both ferry vessels involved in this collision admeasured under 100 gross tons. The Safety Board urged the Coast Guard to require radar aboard small inspected passenger vessels that carry 50 or more passengers and also to require that operators of these vessels be trained to use the radar properly (NTSB 1988a). The Safety Board again affirmed its position in 1988 that the number of passengers rather than gross tonnage should be the basis for setting safety regulations.

M-88-10

Require, in the current regulatory project (CGD 85-080) concerning small passenger-carrying vessels, that safety standards relative to construction, lifesaving equipment, firefighting equipment, and manning and licensing be based on the number of passengers carried rather than the gross tonnage of the vessel.

The Coast Guard replied on July 29, 1988, that it concurred with the intent of the recommendation and that passenger levels would be considered in the upcoming rulemaking action CGD 85-080. The Coast Guard said it intended to employ a system of gradually increased requirements, as the number of passengers increased, such that small passenger vessels carrying a large number of passengers or with a large number of overnight passengers would be required to demonstrate a level of safety equivalent to that of passenger vessels subject to Subchapter H regulations. The Safety Board classified the safety recommendation as "Open--Acceptable Action." This recommendation is reiterated to reemphasize the Safety Board's position that any new safety equipment regulations and manning requirements should be based on the number of passengers.

The Coast Guard recognizes that the Subchapter T regulations for the safety of small passenger vessels are outdated and has relied on extensive use of informal policy in an attempt to keep the regulations abreast of the many changes affecting the small passenger fleet.[23] The Coast Guard has stated that development of the Subchapter T regulations did not consider the hazards and risks associated with the operation of oversized small passenger vessels--passenger vessels that carry many passengers and are larger than vessels originaly contemplated by the Subchapter T rules. Because the builders of small passenger vessels have gained expertise in the use of exemptions, innovative design and construction techniques, and other techniques to reduce gross tonnage to less than 100, the Coast Guard stated that compliance with the existing regulations in Subchapter T alone does not protect against the hazards inherent by the physical size, passenger capacity, and operations of oversized small passenger vessels.

The Coast Guard issued an NPRM on January 30, 1989, entitled "Small Passenger Vessel Inspection and Certification" (54 FR 4412). A portion of the NPRM states the following:

> The hazards and risks created by the operation of small passenger vessels varies greatly depending on length, total passenger capacity, existence of overnight accommodations, number of decks, service, route, machinery, etc. Consequently, the Coast Guard has developed a graduated system of regulations with increasingly more stringent requirements for a vessel or operation which presents increasingly greater safety hazards or risks.

In the proposed rule, the Coast Guard kept some existing passenger-level breakpoints, such as 49 passengers and 150 passengers. However, the proposed rule also added some new breakpoints, including "more than 400 passengers" for DSC vessels and "with overnight accommodations." Although the factors mentioned by the Coast Guard--such as length, service, and route--may also be relevant to the level of risks, the number of passengers and ability of the crew to effectively handle their responsibilities in an emergency should be the primary consideration.

On September 12, 1989, Coast Guard issued its final rule entitled "Tonnage Measurement of Vessels." This rule incorporates the system of tonnage measurement established under the ITC and would phase in the system. Most U.S. passenger vessels, however, would not be affected by the phase-in of the ITC because the rule would allow the availability of the alternate domestic U.S. measurement system to be "continued for regulatory purposes so that the laws of the United States would be preserved in order that vessels engaged in domestic commerce would not be adversely affected." The exemption in the U.S. Coast Guard's rule perpetrates the "status quo" to existing passenger vessels even though the ITC system would provide a uniform tonnage measurement system that more accurately reflects a vessel's true size. The

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[23] 54 FR 4412.

Safety Board believes that the U.S. admeasurement system should reflect the true size of a small passenger vessel and that safety equipment and manning requirements should be based on the vessel's true size.

CHAPTER 4

SAFETY EQUIPMENT

Lifesaving Equipment

The Safety Board has consistently called for improved lifesaving equipment to keep all passengers and crewmembers out of the water. As the result of three accident investigations, the Safety Board in 1986 stated that passenger vessels operating in waters where the threat of hypothermia is present must "have adequate primary lifesaving equipment that prevents immersion in the water for all passengers and crew" (Safety Recommendation M-86-61) (NTSB 1986a). The Safety Board reiterated the recommendation in its reports on the collision of the MISSISSIPPI QUEEN and CRIMSON GLORY (NTSB 1986b) and the FISH-N-FOOL accident (NTSB 1987b).[24]

> M-86-61
>
> Require that all passenger vessels except ferries on river routes operating on short runs of 30 minutes or less have primary lifesaving equipment that prevents immersion in the water for all passengers and crew.

The Coast Guard replied most recently on May 18, 1988, concurring with the overall intent of the recommendation and stated that as a general requirement, small passenger vessels in ocean, coastwise, and Great Lakes services, and large vessels in lakes, bays and sounds, and in river services would have to carry survival craft for all persons on board that prevents immersion in the water. Exceptions would be permitted for vessels operating where the temperature is above 15 ^{o}C (59 ^{o}F), and for vessels in lakes, bays and sounds, and river services operating within 1 mile from shore. The Safety Board replied on October 3, 1988, that the Coast Guard's exceptions were too extensive and the recommendation was classified as "Open-Unacceptable Action." The Safety Board's concern was heightened by the grounding of the passenger vessel ISLANDER near Woods Hole, Massachusetts, on July 29, 1988 (NTSB 1988b). The Safety Board documented that the ISLANDER had a maximum capacity of 788 persons but had only 10 liferafts with a total capacity of 250 persons. On the day of the accident, 527 persons were on board. The Coast Guard exempted the ISLANDER from carrying liferafts for 100 percent of the passengers because the vessel operates in lakes, bays and sounds, and the prevailing water temperature generally is above 15 ^{o}C.

The Safety Board remains concerned by the Coast Guard's position. Many passenger vessels operate in areas where visibility is frequently limited because of heavy fog, rain, or snow; for example the Woods Hole to Martha's Vineyard route off the coast of Massachusetts where the ISLANDER grounded. In a worst case scenario--for example, a vessel with inadequate primary lifesaving equipment on board, having sunk during conditions of heavy fog--

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[24] The issue of lifesaving equipment was also addressed in the accident report on the YANKEE and HARBEL TAPPER (NTSB 1984).

rescue personnel would unlikely be able to locate all passengers in the water before they perish. Additionally, vessels responding to an emergency with crews not trained in rescue procedures may inadvertently injure survivors as they maneuver to rescue them in the water.

Therefore, the Safety Board continues to press for full primary lifesaving capacity that keep passengers out-of-the-water for all passenger vessels except for ferries on river routes operating on short runs of 30 minutes or less. Thus, Safety Recommendation M-86-61 is being reiterated because of the Coast Guard's failure to complete action in a timely manner.

Another example, involving a domestic large passenger vessel, further highlights the Safety Board's concern that passengers not enter the water in an emergency. Following the collision between the U.S. passenger vessel MISSISSIPPI QUEEN and the U.S. towboat CRIMSON GLORY in the Mississippi River on December 12, 1985, hundreds of passengers, fortunately, were not forced to enter the water. Had the passengers been forced to enter the water, the MISSISSIPPI QUEEN was equipped with primary lifesaving equipment[25] (inflatable liferafts in this case) for only 85 passengers, or slightly more than 13 percent of the 635 persons that could be permitted on board. Coast Guard regulations and the vessel's Certificate of Inspection required this type of equipment for only 10 percent of the passengers on board. The environmental conditions and the long delay in search and rescue response (1 hour for the first Coast Guard helicopter to arrive and 4 hours for the first Coast Guard cutter to arrive) did not give the Safety Board confidence that the current safety equipment requirements were adequate. In this case, the river current would have swept passengers 1 mile from the accident site in 15 minutes. As summarized in the Safety Board report, passengers would have had difficulty swimming to shore in the strong 4-to 6-mph river current and the 11 ^{o}C (52 ^{o}F) water temperature, a temperature at which prolonged exposure would lead to hypothermia and perhaps death (NTSB 1986b).

The Coast Guard NPRM "Small Passenger Vessel Inspection and Certification" (called the Small Passenger Vessel NPRM) issued January 30, 1989 (54 FR 4412), would require equipment to keep passengers out of the water on some small passenger vessels in certain waters. The rule, however, allows the substitution of inflatable buoyant apparatus and life floats that would necessitate passengers entering the water under certain conditions. In the Safety Board's response (appendix C) to the NPRM, the Safety Board stated that these provisions needlessly complicate the regulations and establish two levels of safety--for passengers in the water and passengers out of the water. The Safety Board believes that all passengers should be provided with out-of-the-water flotation equipment.

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[25]The term "primary lifesaving equipment" means a lifeboat or an acceptable substitute such as an inflatable liferaft. Life preservers and ring life buoys are not included in the definition.

Other reasons for keeping all passengers out of the water are:

1. to provide protection from marine predators;
2. to provide support for unconscious or injured survivors;
3. to provide an adequate rescue platform so that survivors do not have to exert themselves to stay above water;
4. to provide a platform that permits the use of survival equipment such as signalling and electronic homing devices; and
5. to provide protection from the ingestion of sea water.

The Safety Board also strongly disagrees with the provisions in the proposed rule that would allow small passenger vessels operating on lakes, bays and sounds, and on river routes to carry buoyant apparatus because such apparatus would require passengers to enter the water in the event of a serious emergency. The Safety Board believes that primary lifesaving equipment that keeps passengers out of the water should be on board all passenger vessels at all times for 100 percent of the passengers.

Other Safety Equipment

Navigation and firefighting equipment.--In its report on the PILGRIM BELLE accident, the Safety Board called for more up-to-date safety equipment, critical to the safe everyday operations of small passenger vessels. The Safety Board was particularly concerned that vessels of the size of the PILGRIM BELLE, in terms of passenger capacity, sometimes operate with limited visibility yet lack enhanced safety equipment. The Safety Board recommended that the Coast Guard require additional electronic navigation equipment--such as radar, loran, or satellite navigation receiver, gyrocompass, and fathometer--on small passenger vessels that operate offshore, particularly in coastal and restricted waters where poor visibility is likely (Safety Recommendations M-86-51 through -54) (NTSB 1986a). The addition of such equipment would substantially improve the navigational capabilities of these passenger vessels.

The Safety Board classified these recommendations as "Closed--Unacceptable Action" based on the Coast Guard's reply, which said that the lack of recommended equipment did not contribute to the accident of the PILGRIM BELLE. The Safety Board, however, recommended this navigation equipment to improve the navigation capabilities of all vessels like the PILGRIM BELLE--oversized small passenger vessels that operate in lakes, bays, sounds, coastwise or ocean routes where poor visibility is often a factor in navigation and may often be out-of-sight of land.

In its Small Passenger Vessel NPRM, the Coast Guard recognized the need for some additional navigation equipment for safety purposes and proposed to require the carrying of a suitable magnetic compass. In its comments on the

NPRM, the Safety Board again emphasized that gyrocompasses should be required on all passenger vessels that have overnight accommodations for 50 or more passengers and that operate on all routes other than rivers. The Coast Guard's proposed rule would also require a general radar for surface navigation of certain vessels, and the Safety Board responded that gyrostabilized radar should be required on passenger vessels with overnight accommodations for 50 or more passengers and all vessels carrying 150 or more passengers on lakes, bays, sounds, and coastwise and ocean routes.

The proposed rule would require a fathometer on vessels more than 65 feet in length and on all dynamically supported craft other than air-cushion vehicles. The Safety Board's earlier recommendation (M-86-53) called for a fathometer on all passenger vessels on all routes other than rivers, but the Safety Board did support the Coast Guard's proposal. The Safety Board recognizes the proposed regulation is a major improvement over the existing regulation, which does not require any small passenger vessel to be equipped with a fathometer. The Coast Guard's proposal would require electronic position-fixing devices only on passenger vessels operating in ocean service. The Safety Board expressed serious concern with the limited application proposed for those devices and maintains that they should be required on all passenger vessels on all routes other than rivers. The Safety Board in its response to the Coast Guard's NPRM stated the following:

> The Safety Board maintains that electronic position fixing equipment should be required on all passenger vessels on all routes other than rivers. The Safety Board believes that any vessel that leaves the sight of land should have adequate position fixing equipment on board for the protection of its passengers. If a vessel is operating beyond sight of land when visibility deteriorates, or when any emergency develops, the operator of the vessel will need to be able to fix his vessel's position in order to navigate, or to provide coordinates for search and rescue units. Without a suitable electronic position fixing device on board, many small passenger vessel operators may not be able to cope with such an emergency situation, and passengers will be needlessly endangered.

Another area of concern to the Safety Board is the need for a fixed firefighting system in the engineroom of certain types of vessels. Currently, the standards for fire protection are identical for all small passenger vessels, even those considered oversized small passenger vessels. In its report on the accident of the PILGRIM BELLE (NTSB 1986a), the Safety Board issued the following recommendation to the Coast Guard:

> M-86-59
>
> Require a fixed firefighting system in the engineroom (without regard to the type of fuel used for propulsion) of all passenger vessels with accommodations for 50 or more overnight passengers.

The Coast Guard responded that it concurred with the Safety Board and that it would consider expanding the requirement for an engineroom fixed fire extinguishing system on all small passenger vessels as part of its planned revisions of Subchapter T regulations. The recommendation has been classified by the Safety Board as "Closed--Superseded" by new Safety Recommendation M-89-120.

The Coast Guard has proposed a change in the Small Passenger Vessel NPRM to require fire extinguishing systems in all spaces containing propulsion machinery, a space containing an internal combustion engine of more than 50 horsepower, a space containing an oil-fired boiler, a space containing gasoline-powered machinery or containing a fuel tank with gasoline, and other areas with combustibles and flammables. The Safety Board has urged the adoption of this regulation because the proposed regulation represents a marked improvement over existing regulations.

However, the proposed Small Passenger Vessel NPRM would exempt existing passenger vessels from a number of safety equipment requirements. For example, the Safety Board does not support the Coast Guard's proposed exemption for radar, speed indicating devices for dynamically supported craft, fathometers, electronic position-fixing devices, or internal communications systems. These equipment requirements are as necessary on existing vessels as they would be on new vessels. This safety equipment will substantially increase the safety of navigation of these vessels; certainly passengers on existing vessels are entitled to the same level of safety as those on new vessels. Thus, the Safety Board believes that the same type of navigation equipment should be required for all small passenger vessels whether old or new that operate in the same service, with a phase-in period of 5 years so that the cost of the new requirements can be amortized.

Emergency position indicating radio beacons (EPIRBs).--An EPIRB is a transmitter that sends an emergency alert signal to help emergency rescue personnel locate a vessel in distress. The signal can be received by a satellite or by aircraft flying overhead. The Safety Board has been a strong advocate for the use of float-free EPIRBs operating on the dedicated frequency of 406.025 MHz. The Safety Board recommended the use of EPIRBs as early as April 1980, with the investigation and report of the capsizing and sinking of the U.S. fishing vessel LOBSTA-1 (NTSB 1980a). On August 17, 1988, the Coast Guard issued its final rule (53 FR 31004) that requires 406.025 MHz EPIRBs to be phased in over a 6-year period for fishing vessels, and fish processing and fish tendering vessels. This time period was provided to allow fishing vessel operators to carry the old 121.5/243 MHz Class A EPIRBs until their expected service life expired. The original proposed rule had supported a phase-in period of 10 years. The Coast Guard, recognizing the value of EPIRBs on passenger vessels operating on ocean or coastwise routes, has proposed in its Small Passenger Vessel NPRM that float-free 406.025 MHz satellite EPIRBs be required for all passenger vessels in ocean or coastwise routes within 6-years--a phase-in period similar to the one allowed for fishing vessels. Although the Safety Board had advocated a 6-year period for phase-in of the 406.025 MHz EPIRB for fishing vessels, the Safety Board believes that passenger vessels should be

provided with the improved altering and locating capabilities of the 406.025 MHz satellite EPIRB on a more accelerated schedule. The requirement for a 406.025 MHz float-free EPIRB will assist search and rescue personnel in locating a passenger vessel with an emergency in a more expeditious time frame, perhaps within minutes. The Safety Board believes that the approximately 2,700 passenger vessels with ocean or coastwise route designations could be outfitted with the new EPIRBs within 3 years. The Safety Board further believes that the number of lives at risk justify a more accelerated schedule for implementation.

CHAPTER 5

PASSENGER INFORMATION AND DRILLS

In its investigations of accidents involving both small and large domestic passenger vessels, the Safety Board has identified four safety issues related to passenger information: (1) passenger safety briefing and/or information available to passengers is needed on actions they should take in the event of an emergency; (2) passenger vessels that have more than one deck need an operational loud speaker or public address system to announce emergency instructions from the navigation bridge; (3) a passenger list and/or count needs to be available at some shoreside location before a passenger vessel departs, so that in case of an accident, search and rescue personnel can determine the number of passengers and crew; (4) emergency drills that include all passengers reporting to an emergency muster or embarkation station are needed on all passenger vessels that cruise for more than 1 day's duration.

Passenger Safety Briefings/Information

The crew of passenger vessels, whether subject to Subchapter H or Subchapter T regulations, should provide information to passengers on what to do in an emergency. Several Safety Board recommendations (all currently classified as "Open--Acceptable Action) issued in 1983, 1984, 1986, and 1987 have urged the Coast Guard to make such requirements:

> M-83-79
>
> Amend 46 CFR 185.25 to require that a safety orientation briefing, which includes a demonstration of the proper method of donning life preservers, be provided to passengers on board small passenger vessels that operate on other than protected waters. This briefing should include a statement that all passengers will be requested to don life preservers when possibly hazardous conditions may be expected to be encountered.
>
> M-84-27
>
> Require that all passenger vessels post conspicuously in passenger spaces passenger safety bills or equivalent instructions for emergency, written in language understandable to nonmariners.
>
> M-86-72
>
> Require that all passengers receive a comprehensive safety briefing by a crewmember soon after boarding a passenger vessel.

M-87-113

Amend 46 CFR 185.25-1(d) to require that a licensed crewmember present a verbal passenger safety briefing, which includes all the subjects listed in 46 CFR 185.25-1(d) (1) through (4), to all passengers before getting underway.

In its proposed Small Passenger Vessel NPRM, the Coast Guard is proposing a mandatory safety orientation briefing for passengers on all small passenger vessels. The Safety Board, in its comments on the NPRM, supports the Coast Guard's mandatory requirement. Safety Recommendations M-83-79, M-84-27, M-86-72, and M-87-113 are being reiterated because the Safety Board's concern about the delay by the Coast Guard in acting on these recommendations, and the recommendations are being reclassified as "Open--Unacceptable Action."

The Safety Board has also made recommendations to individual companies and to NAPVO to improve passenger briefings and/or information prior to a vessel's departure. Response has been good. The NAPVO has distributed to its members information stressing the importance of making verbal safety announcements to passengers aboard commuter vessels at the beginning of each voyage (Safety Recommendation M-88-17; classified as "Closed--Acceptable Action"). Additionally, the Direct Line Commuter Service, Inc., has taken action within its company to announce safety messages to passengers (Safety Recommendation M-88-15; classified as "Closed--Acceptable Action"). The Safety Board interviewed senior safety officials of the Washington State Ferries, who provided published information and posted station bills for use by ferry passengers in understanding emergency procedures. Although the Safety Board prefers that safety briefings be verbal, Washington State Ferries has established a program including written safety brochures and station bills that satisfies the intent of the following Safety Board recommendation:

M-82-31

Establish a program to inform ferry passengers of the action they should take in various types of emergencies, and make the information readily available by suitable means at ferry terminals and on board ferries.

As a result of the information provided from the published materials and interview, and the actions taken by Washington State Ferries, the Safety Board has classified Safety Recommendation M-82-31 as "Closed--Acceptable Alternate Action."

Emergency Loudspeaker Systems

The Safety Board's investigation of the collision of the U.S. passenger vessel M/V YANKEE and the Liberian cargo vessel M/V HARBEL TAPPER in dense

fog in Rhode Island Sound (NTSB 1984) led the Safety Board to recommend in 1984 that the Coast Guard:

> M-84-25
>
> Require that passenger vessels with more than one passenger deck have installed an adequate loudspeaker system suitable for announcing passenger advisories, instructions, and emergency alerts from the navigation bridge.

The Coast Guard replied on October 2, 1987, that it concurred with the intent of the recommendation and agreed that all passenger vessels subject to Subchapter H regulations and certain small passenger vessels should have emergency loudspeaker systems. The Safety Board classified the recommendation as "Open--Acceptable Action."

In the Coast Guard's Small Passenger Vessel NPRM, certain small passenger vessels are required to be equipped with a public address system operable from the vessel's operating station. The Safety Board, in its comments to the NPRM, believes that the adoption of this proposed rule will substantially improve safety and urges the adoption of the regulation. Safety Recommendation M-84-25 is being reiterated to reemphasize the Safety Board's belief that action to complete this recommendation should be taken in the Small Passenger Vessel final rule.

Passenger List and/or Count

Several accidents investigated by the Safety Board addressed a problem in search and rescue that occurs when rescue personnel cannot identify the number or names of passengers to determine if persons are missing (YANKEE, MISSISSIPPI QUEEN, and charter passenger vessels JOAN LA RIE III, FISH-N-FOOL, MERRY JANE, and SAN MATEO). The Safety Board issued the following recommendation in 1986 to the Coast Guard (NTSB 1986b):

> M-86-76
>
> Require that the master or licensed operator of all passenger vessels, except ferries on short routes, deposit an accurate passenger and crew manifest ashore before each sailing, and update the manifest during the voyage. Require the master of ferries on short routes to keep an accurate count of all persons aboard.

The Coast Guard concurred; the Safety Board classified this recommendation as "Open--Acceptable Action." Safety Recommendation M-86-76 is being reiterated because the Safety Board believes that the need for a passenger list and/or count must be included in the Small Passenger Vessel final rule.

The August 20, 1989, collision of dredge BOWBELLE (1,475 gross tons) and the passenger vessel MARCHIONESS (90 gross tons) on the River Thames in

London again highlighted the confusion that can occur when rescue authorities cannot document the number of passengers on board. More than 57 people were estimated to have died in this accident.

In its Small Passenger Vessel NPRM, the Coast Guard proposes to require that an accurate count or list of passengers be left at a shoreside location so that search and rescue personnel can determine the number of people on board the passenger vessel. The Safety Board has long recognized the value of such a listing and/or count to search and rescue authorities. The Safety Board has urged adoption of these proposed requirements.

Passenger Emergency Drills

Emergency drills (fire and abandon ship) are positive safety measures needed on all passenger vessels operating cruises. As a result of the PILGRIM BELLE accident, the Safety Board issued the following recommendation in 1986 to the Coast Guard (NTSB 1986a):

> M-86-60
>
> Require fire and boat (abandon ship) drills which include passengers reporting to their emergency muster station on all passenger vessels within 24 hours of departure on cruises that are more than one day's duration.

The Coast Guard concurred in part with the recommendation and said it would propose new muster and emergency regulations for passenger vessels. As part of the proposed revision of Subchapter T regulations, consideration would be given to fire and boat drill requirements similar to those required for vessels subject to Subchapter H regulations. The Safety Board classified this recommendation as "Open--Acceptable Action."

The Coast Guard's Small Passenger Vessel NPRM would specifically require abandon ship drills on vessels with more than four survival craft to accommodate the total number of persons permitted on board the vessel, and on a vessel 65 feet or more long with overnight accommodations for more than 49 passengers. Fire drills would be required to ensure that all crewmembers are familiar with their duties in case of fire. The Safety Board has urged the Coast Guard to comply with Safety Recommendation M-86-60, which would require fire and boat drills for passengers on small passenger vessels departing for voyages longer than 1 day's duration. Safety Recommendation M-86-60 is being reiterated as a result of this safety study.

CHAPTER 6

HUMAN PERFORMANCE ISSUES

Alcohol and Drug Use by Crewmembers

The earliest report by the Safety Board addressing the role of alcohol in a marine accident was that on the catastrophic collision of the ferry GEORGE PRINCE and the Norwegian tank ship SS FROSTA on the Mississippi River, October 20, 1976 (NTSB 1979b). Seventy-two passengers and five crewmembers of the GEORGE PRINCE were killed. The boatmaster responsible for the navigation of the GEORGE PRINCE was found to have a blood alcohol concentration of 0.09 percent. The Safety Board concluded that the probable cause of the collision was his deficient conning and maneuvering judgment. In this accident, alcohol tests were performed; in accidents prior to 1989, the Safety Board could not clearly eliminate alcohol and drugs as factors because tests were not required by the U.S. Coast Guard and thus, few tests were performed. Therefore, although the potentially devastating effects of an alcohol- or drug-impaired master are recognized, the Safety Board has few data reflecting the impact of alcohol or drug abuse.

On December 14, 1987, the Coast Guard published its final rule "Operating a Vessel While Intoxicated" that prohibits a mariner from assuming duties within 4 hours of consuming alcohol and from operating a vessel while intoxicated (for a commercial vessel, this is a blood alcohol concentration of 0.04 percent by weight in blood.) The rule addresses the use of "reasonable cause chemical testing" when there is an occurrence of a major marine casualty and/or an individual is suspected of being intoxicated. A marine employer is required to report within 5 days to the nearest Coast Guard Captain of the Port any observations of alcohol and/or drug use by an employee in an accident. Further, an entry is to be made in the official logbook, if carried, pertaining to those individuals for whom evidence of intoxication is obtained.

On November 21, 1988, the Coast Guard issued its final rule entitled "Programs for Chemical Testing of Commercial Vessel Personnel" (CGD 86-067; 53 FR 47064). The rule requires maritime operations to establish antidrug programs that include pre-employment, periodic, random, postaccident and reasonable-cause testing. It also requires postaccident testing for alcohol use and prohibits the use of alcohol within 4 hours of reporting for duty. The rule covers any maritime employee who performs duties directly affecting the safety of the vessel's operations. Thus, the rule applies to any licensed or documented seaman, anyone in a safety-sensitive position aboard a vessel that is required to be operated by a licensed or documented seaman, and Federal and State pilots operating vessels on U.S. navigable waters.

The implementation schedules for the rule vary, depending on the number of employees subject to the rule. The regulations define a large company as one with more than 50 affected employees, a medium-size company as one with 11-50 affected employees, and a small company as one with 10 or fewer affected employees. Large and small U.S. passenger vessels are covered by the rule.

Under the rule, effective December 21, 1989, pre-employment testing for drugs must be implemented within 6 months by large companies, within 1 year by medium-size companies, and within 2 years by small companies. After December 21, 1989, periodic testing for drugs will be required with any physical examination for licenses, certificates of registry, and merchant mariner's documents. The implementation schedule for random drug testing calls for 25 percent testing by large companies for the first 2 years and 50 thereafter, and 25 percent for the first 3 years and 50 percent thereafter for small and medium-size companies. Drug testing for reasonable cause is to be implemented in 1 year by large and medium-size companies, and in 2 years by small companies. The rule defines a "serious marine incident" as one involving death, $100,000 damage, loss of vessel, or discharge of a hazardous substance or of more than 10,000 gallons of oil into U.S. navigable waters. In any of these situations, the rules mandate testing for both drugs and alcohol of any crewmember who is determined by a marine employer or a law enforcement official to have been "directly involved in" the accident. A testing kit must be carried on vessels unless they can be obtained within 24 hours from the time an incident occurs.

Finally, each employer must establish an Employee Assistance Program that includes education and training on drug use for crewmembers and supervisors. The rules make no provision for employer-sponsored rehabilitation programs. Training for supervisory personnel must be at least 60 minutes long and must include the following elements: effects and consequences of drug and alcohol use on personal health, safety, and work environment; manifestations and behavioral cues that may indicate drug and alcohol use and abuse; and documentation of training provided to crewmembers and the employer's supervisory personnel.

On September 9, 1988, the Safety Board provided written comments to the Coast Guard on the proposed rule (the full text of the Safety Board's comments is in appendix D). For the rule to be effective, the Safety Board believes the time limit for postaccident sample collection should be reduced substantially from the 24 hours now permitted. Such an time limit is excessive and will contribute to delays in postaccident testing of crewmembers and others who may have been involved in the accident. Delays in the collection of toxicological specimens diminish and even invalidate the value of drug/alcohol toxicological tests.

A delay in sample collection of more than 4 hours seriously limits the ability of tests to detect the parent drug or its psychoactive component(s), such as cocaine, THC, some amphetamines, and PCP, in the blood. Information on these components and their respective concentration in the blood is often vital to the interpretation of possible drug effects on human performance at the time of the accident--information essential in the determination of the role of alcohol and/or drug use in causing or contributing to an accident.

The Safety Board cannot fully evaluate the impact of the rules on the marine industry because they will not be fully implemented for at least 3 years. The Safety Board, however, has evaluated similar rules in a study of the railroad industry, and some of the observations, conclusions, and

recommendations made in that study may be relevant to the Coast Guard's rules (NTSB 1988c). For example, the Safety Board noted that the Federal Railroad Administration's rules spell out the circumstances that trigger testing for reasonable cause and should include any violation of any safety or operating rule that compromises the safety of operations or the welfare of passengers or employees. Marine employers should monitor relevant behavior and performance such as work attendance, work habits, and motor vehicle driving records of all marine employees in safety-sensitive positions. The Safety Board believes that monitoring of behavior and performance should also be spelled out in the Coast Guard's rules. The Safety Board also noted that the Coast Guard's rules should be expanded to require testing of crewmembers involved in any accident resulting in serious injury. The rules should also require marine employers to collect appropriate toxicological samples as soon as practicable and to make every effort to collect specimens within 4 hours after the triggering event. If samples cannot be collected, the rules should require written explanation of the reasons for any delay in collection and that the reasons be submitted to the Coast Guard. In any case, however, samples should be collected and tests made, even if more than 4 hours have elapsed after an accident.

The National Driver Register (NDR) could be used by the Coast Guard to review motor vehicle driving records for applicants or renewals for licenses or certificates of registry to serve or operate a passenger (or other commercial) vessel. The NDR would help screen applicants with possible alcohol problems and others who may be potentially unsafe marine licensees. Therefore, marine employers and the Coast Guard should take full advantage of the opportunity to screen current and future marine licenses through the NDR, if given that authority by Congress, or through other private traffic record search systems.[26]

On April 11, 1989, H.R. 1775 (the "Coast Guard License Verification Act") was introduced to assist the Coast Guard when verifing information on applications and renewals for certain commercial vessel licenses and certificates under 46 USC 7101. This bill proposed to expand the Coast Guard's authority to use motor vehicle record checks such as the NDR. Additionally, the Secretary of Transportation announced on June 20, 1989 (DOT Press Release 75-89), that the Department of Transportation (DOT) had submitted a bill to enable the Coast Guard to suspend or revoke licenses of mariners with a history of driving convictions.

Fatigue

The Safety Board addressed safety concerns over prolonged and unusual work shift schedules and crewmember fatigue in a collision between the U.S. passenger/car ferries CAPE HENLOPEN and NORTH STAR on Long Island Sound, Orient Point, New York, on July 9, 1987 (NTSB 1988d). This accident highlighted that the master of one of the ferries was on duty 16 to 17 hours per day. The Safety Board was unable to establish the role fatigue may have

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[26] Further discussion of the National Driver Register appears in the Safety Board's report on alcohol and drug use (NTSB 1988c).

played in this accident but remained concerned about existing and proposed crewmember work schedules that involved prolonged duty days that extended over 5-day work weeks.

The Safety Board concluded that "current Coast Guard regulations do not establish limitations to effectively reduce the likelihood of cumulative fatigue and its associated risk to the performance degradation among crewmembers of ferry vessel operations." Federal law[27] has addressed the maximum number of hours that crewmembers may work in other elements of the marine industry. Specifically, laws governing towing vessel operations state that an individual licensed to operate a towing vessel may not work more than 12 hours in a consecutive 24-hour period. Many more people will be at risk in ferry operations than most towing operations. Accordingly, the Safety Board recommended on July 27, 1988, that the U.S. Coast Guard:

> M-88-44
>
> Establish watch and duty time limitations for crewmembers on board ferries and other inspected passenger vessels.

The Coast Guard responded on December 1, 1988, suggesting that research projects were underway that would provide "useful information in this area" and that the Coast Guard should analyze the results of these projects to determine the most effective means to prevent fatigue-induced performance degradation in the marine transportation mode. The Safety Board has classified the Coast Guard's response as "Open--Unacceptable Action."

As a part of this study on passenger vessels, a Safety Board staff member was provided information from a number of masters that operate ferries in the Washington State Ferries system. They indicated that irregular shift schedules were causing increasingly dangerous conditions for masters, first mates, and crewmembers because of interrupted work and sleep patterns, interrupted family and social patterns, and general deterioration of health. One watch on the Fauntleroy/Vashon/Southworth route is known by masters as the "Death Watch." This watch includes five shifts (one 10 a.m. to 6 p.m. shift, and two 2 a.m. to 10 a.m. shifts, and two 7 a.m. to 3 p.m. shifts) over a 5-day period. One captain in a May 1988 letter to the House of Representatives, Subcommittee on Coast Guard and Navigation, stated:

> The direct result of such a schedule is impaired judgment, slowed response time, drowsiness at inappropriate times, excessive nervousness due to increased caffeine intake, and irritability. During this time, we have as many as 2,000-plus passengers on board.

In other modes of transportation where a large number of passengers may be at risk, Federal agencies have defined work time limits in the interest of public safety. For example, in the railroad industry the limit for duty

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[27] 46 USC 8104(h). "Watches."

hours for members of a train or engine crew is regulated. The standards for air carriers are also regulated. Off-duty time for flight deck crewmembers is required to be double the length of on-duty time, and domestic flying time is generally limited to 8 hours.

The Safety Board believes that work schedules in ferry and domestic passenger operations should facilitate maximum watchstanding vigilance and optimum operating skills by providing well rested masters, mates, and crewmembers. Irregular work shifts can only lead to fatigue and an increased risk of degradation in performance by ferry vessel crews. Therefore, Safety Recommendation M-88-44 is being reiterated because of the Safety Board's concern that the Coast Guard is not acting to effectively address this serious human performance safety issue. Additionally, the Safety Board believes that the Washington State Ferries should take actions to minimize the deleterious effects of fatigue on crewmembers on those routes requiring irregular and prolonged duty times, times that have been recognized by scientific study and review to lead to degradation of performance. Further, the Safety Board believes that the State of Washington should review work shift schedules and watches of masters, mates, and crewmembers operating Washington State Ferries and take actions to minimize mental and physical fatigue.

The Safety Board has also addressed the need for an aggressive, overall Federal program directed at the problems of fatigue and sleep issues in transportation safety. On May 12, 1989, the Safety Board issued the following recommendations to the U.S. Department of Transportation:

I-89-1

Expedite a coordinated research program on the effects of fatigue, sleepiness, sleep disorders, and circadian factors on transportation system safety.

I-89-2

Develop and disseminate educational material for transportation industry personnel and management regarding shift work; work and rest schedules; and proper regimens of health, diet, and rest.

I-89-3

Review and upgrade regulations governing hours of service for all transportation modes to assure that they are consistent and that they incorporate the results of the latest research on fatigue and sleep issues.

PART 2

FOREIGN FLAG PASSENGER VESSELS

CHAPTER 7

SAFETY OVERSIGHT

The Coast Guard's authority to ensure a level of safety for foreign flag passenger vessels stems from two sources: U.S. law, and international conventions and regulations. Foreign flag passenger vessels operating on U.S. navigable waters are subject to the inspection laws of 46 USC 3303(a), "Reciprocity for Foreign Vessels," which states:

> (a) ...a foreign vessel of the country having inspection laws and standards similar to those of the United States and that has an unexpired certificate of inspection issued by proper authority of its respective country, is subject only to an inspection to ensure that the condition of the vessel's propulsion equipment and lifesaving equipment are as stated in its current certificate of inspection. A foreign country is considered to have inspection laws and standards similar to those of the United States when it is a party to an International Convention of Safety of Life at Sea to which the United States Government is currently a party....

In addition, U.S. law (46 USC 3505) also requires the Coast Guard to verify and examine foreign passenger vessels of more than 100 gross (U.S.) tons having accommodations for 50 or more passengers and to see that they comply with SOLAS before they may operate from a U.S. port with passengers who embarked at that port.

Internationally, SOLAS 74 sets out the following guidance (Regulation 19, "Control") (International Maritime Organization 1986):

> (a) Every ship when in the port of another Party is subject to control by officers duly authorized by such Government in so far as this control is directed towards verifying that the certificates issued under regulation 12 ["Issue of certificates"] or regulations 13 ["Issue of certificate by another Government"] of this chapter are valid.
>
> (b) Such certificates, if valid, shall be accepted unless there are clear grounds for believing that the condition of the ship or of its equipment does not correspond substantially with the particulars of any of the certificates or that the ship and its equipment are not in compliance with the provisions of regulations 11(a) and (b) of this chapter ["Maintenance of conditions after survey"].

> (c) In the circumstances given in paragraph (b) of this regulation or where a certificate has expired or ceased to be valid, the officer carrying out the control shall take steps to ensure that the ship shall not sail until it can proceed to sea or leave port for the purpose of proceeding to the appropriate repair yard without danger to the ship or persons on board.
>
> (d) In the event of this control giving rise to an intervention of any kind, the officer carrying out the control shall forthwith inform, in writing, the Consul or, in his absence, the nearest diplomatic representative of the State whose flag the ship is entitled to fly of all circumstances in which intervention was deemed necessary. In addition, nominated surveyors or recognized organizations responsible for the issue of the certificates shall also be notified. The facts concerning the intervention shall be reported to the IMO.
>
> (e) The port State authority concerned shall notify all relevant information about the ship to the authorities of the next port of call....
>
> (f) When exercising control under this regulation all possible efforts shall be made to avoid a ship being unduly detained or delayed. If a ship is thereby unduly damaged or delayed it shall be entitled to compensation for any loss or damage suffered.

General authority to ensure the safety level of foreign flag passenger vessels is provided directly to the Coast Guard's District Commanders and Captains of the Ports:

> Each District Commander or Captain of the Port may order a vessel to operate or anchor in the manner directed when...[he/she] has reasonable cause to believe that the vessel is not in compliance with any regulation, law or treaty or...[he/she] has determined such order is justified in the interest of safety...or condition of the vessel.[28]

The primary tool available to the Coast Guard's local Officer in Charge of Marine Inspection to document the safety level of a foreign flag passenger vessel is the program "Control Verification or Examination of Foreign Vessel," in effect since 1968. Foreign flag passenger vessels must be examined by the Coast Guard at their first port of call in the United States and be examined annually and quarterly thereafter. Although the examinations can focus on compliance with all SOLAS and regulatory requirements, the emphasis has been on fire safety and lifesaving requirements. Other areas

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[28] 33 CFR 160, Subpart B, "Control of Vessel and Facility Operations."

that may be examined by the Coast Guard, for example, include operational tests of emergency generators, bilge pumps, steering gear, watertight doors in subdivision bulkheads, remote controls for fuel pumps, and ventilation systems. The Coast Guard conducts and reviews fire and lifesaving drills. In comparison, the Coast Guard's inspections for U.S. passenger vessels are not limited to safety certificate verification or examination. The Coast Guard has authority to inspect all systems, structures, and lifesaving and fire protection equipment on U.S. passenger vessels, including all accessible parts of the vessel's hull, machinery, and equipment to be assured that they are satisfactory condition. These inspections can be conducted at any time by the U.S. Coast Guard without advance notification.

Once a vessel has been examined by the Coast Guard, a Form CG-4504, "Control Verification for Foreign Vessel," is issued. Issuance of this form is not specifically authorized by IMO's SOLAS convention; however, it is authorized by U.S. regulations. The Coast Guard uses this form to provide orderly administration of its examinations and to expedite the entrance and clearance procedures for foreign flag passenger vessels calling at U.S. ports (see footnote 3). The Coast Guard provides an examination booklet to its inspectors for guidance on the areas to be examined. The booklet contains room for entries on areas covered by SOLAS requirements.

Another tool available to local U.S. Coast Guard Inspection Offices in accomplishing their examinations is the guidance provided to foreign flag passenger vessels by the Coast Guard in Navigation and Vessel Inspection Circular NVIC 1-85 issued February 19, 1985 (NVICs provide guidance and have no force of law). The NVIC was issued because of several fires aboard foreign flag passenger vessels and the need for continued vigilance with regard to fire safety. NVIC 1-85 is not a regulation; rather, it urges owners to avail themselves of a plan review so that their vessels are not unduly delayed by the initial Control Verification Examination. The purpose of the plan review undertaken by the U.S. Coast Guard Marine Safety Center[29] addressed in NVIC 1-85 is to provide guidance and comments to the Officer-in-Charge of local Coast Guard Marine Inspection Offices so that the vessel can be examined expeditiously. The information the Coast Guard requests in the NVIC concerns bulkhead and deck construction, fire protection, main vertical fire zones and draft stops, means of escape, and passenger and crew capacity. The owners are expected to provide this information 45 days before the vessel arrives in the United States for the first time. This provides the Coast Guard's Marine Safety Center time to check the vessel's plans and provide information to the vessel's owner(s) and representative(s) to correct serious deficiencies before the initial Control Verification Examination. This plan review is essential to the Coast Guard's safety program for foreign flag passenger vessels so that any substantial fire safety problems can be resolved prior to a foreign flag passenger vessel's arrival at a U.S. port.

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[29]U.S. Coast Guard Marine Safety Center, located in Washington, D.C., provides "fire safety plan review for foreign flag passenger vessels prior to their arrival for the first time in the United States."

The U.S. Coast Guard works to improve the safety requirements for foreign flag passenger vessels through the IMO. Explanation of how the Coast Guard must work within the international arena will be helpful to discussions on the safety issues of concern to the Safety Board that involve foreign flag passenger vessels.

The IMO was established by the United Nations in 1948 as the first international body devoted exclusively to maritime safety and other matters.[30] The Assembly, the governing body of the IMO, meets once every 2 years; it comprises all 132 Member States and one associate Member. Most of the work in the IMO is done by committees and subcommittees. The Maritime Safety Committee is the most senior of the technical committees. Its subcommittees address the following subjects: safety of navigation; radiocommunications; life-saving, search and rescue; standards of training and watchkeeping; carriage of dangerous goods; ship design and equipment; fire protection; stability and loadlines, and fishing vessel safety; containers and cargoes; and bulk chemicals.

Other technical committees include Marine Environment Protection, Legal, Technical Cooperation, and Facilitation. The Maritime Safety Committee is the committee that addresses safety concerns of passenger vessels.

The process of developing new international regulations is time consuming and involves safety discussions and the agreement of IMO Members. The IMO has, in the last 25 years, promoted the adoption of some 30 conventions and protocols, such as the international convention for the Safety of Life at Sea (SOLAS), and adopted over 600 codes and recommendations concerning maritime safety, the prevention of pollution, and related matters (International Maritime Organization 1988).

The U.S. Coast Guard plays an active role in IMO. The Coast Guard works closely with the State Department and involves private sector participation (ship owners, operators, and others) through the Shipping Coordinating Committee, a Federal advisory committee formed in 1958 by the Department of State. The Coast Guard is the official U.S. representative to the IMO.

Before U.S. attendance at IMO meetings, public meetings of the Shipping Coordinating Committee, announced in the Federal Register, are normally held to formulate U.S. positions. Private sector and governmental participation is encouraged in the formulation of U.S. positions relating to issues to be discussed by IMO, and sometimes private sector members involved in the U.S. maritime industry are invited to participate with the Coast Guard at IMO meetings. In 1987, the Coast Guard chaired 3 of 10 technical subcommittees and 12 working groups of the Maritime Safety Committee (Sheehan and Yoest 1987).

The initial work on an IMO regulation or other action begins when a Member State prepares a position paper or topic for discussion by the IMO.

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[30] Until May 22, 1982, the Organization was called the Inter-Governmental Maritime Consultative Organization (IMCO).

The paper or topic is forwarded to the Maritime Safety Committee, which meets twice a year and reviews the rationale and documentation provided by the Member State. If the Committee agrees that the topic warrants technical consideration, it is assigned to the appropriate subcommittee, which meets once or twice a year. At the working session of the subcommittee, the topic or position paper may be dealt with directly or, if complex, assigned to an ad hoc working group consisting of any interested countries. The working group prepares a proposal for the subcommittee, and if the subcommittee agrees with the proposal, it is presented to the Maritime Safety Committee. If the subcommittee does not agree, then new position papers are either submitted to the next session 9 or 12 months later or the topic is removed from the subcommittee's agenda. The Maritime Safety Committee takes action on any forwarded proposal and, if the proposal is approved, produces a draft instrument and submits it to the next Assembly for approval. If approved, it becomes a proposed amendment, which is sent for ratification by Member States. Normally a new amendment has to wait at least 2 years before it is ratified and another year before it goes into effect. New requirements for vessels apply only to vessels built after the effective date of the amendment.

Because this process is lengthy, the Maritime Safety Committee can, in the interim, issue an MSC circular, indicating that the committee views the proposal as necessary and provides guidance of Member States to follow, pending the amendment's introduction into the Convention. (An example of a proposed MSC circular is presented in appendix E.)

CHAPTER 8

FIRE PROTECTION

Five serious fires, one involving the loss of two lives, focused the Safety Board's attention on the need for improved fire protection on foreign flag passenger vessels. These fires occurred on the ANGELINA LAURO, SCANDINAVIAN SEA, SCANDINAVIAN SUN, EMERALD SEAS, and the SCANDINAVIAN STAR and were investigated by the Safety Board. In addition, the Safety Board reviewed documentation of fires on the SONG OF AMERICA (1988) and the PRINSENDAM (1980), and was informed of a fire on the AMERIKANIS (1988) and a second fire on the EMERALD SEAS (1989); the latter three fires were not investigated by the Safety Board or the Coast Guard.

On the afternoon of March 30, 1979, a fire erupted in the crew galley of the Italian passenger vessel ANGELINA LAURO while it was berthed at Charlotte Amalie Harbor, St. Thomas, U.S. Virgin Islands. The fire quickly spread from the crew galley to a dining room. The fire was fought on board by the vessel's crew and shoreside firefighters. Heavy smoke impeded the firefighting efforts and eventually forced the crew to leave the vessel. Firefighting efforts continued to be directed against the exterior of the vessel, but the fire raged out of control throughout the interior spaces until it burned itself out 4 days later. The ANGELINA LAURO was virtually destroyed. Fortunately, only two people were injured, and their injuries were minor.

The Safety Board determined that the probable cause of the initial fire aboard the ANGELINA LAURO was overheated oil in an unattended skillet in the crew galley. The fire spread throughout the vessel and destroyed it because of (1) the failure of responsible vessel personnel to promptly establish effective control and coordination of the shipboard firefighting effort; and (2) failure of the vessel's fire detection and sprinkler system to provide early warning and suppression of the fire (NTSB 1980b).

A few minutes before 7:20 p.m. on March 9, 1984, a fire was discovered in a room occupied by two crewmembers aboard the Bahamian cruise ship SCANDINAVIAN SEA. The vessel, on a daily 11-hour gambling cruise out of Port Canaveral, Florida, with 744 passengers and 202 crewmembers aboard, had been anchored about 7 miles off the coast of Florida, and was just underway. It proceeded to its berth at the Port Canaveral Cruise Terminal while the vessel's firefighting team fought the fire. After the vessel berthed at 8:57 p.m., the passengers were disembarked, and the Coast Guard and local firefighters boarded the vessel to help fight the fire. The fire, although contained within the forward vertical fire zone, spread through the upper decks. The fire was not extinguished until March 11, 3 days after it began. No injuries or loss of life occurred, but the vessel was declared a constructive total loss; it was valued at $16 million (NTSB 1985a).

About 11:00 p.m. on August 20, 1984, a fire erupted in the auxiliary machinery (generator) room of the Bahamian passenger ship SCANDINAVIAN SUN and spread to adjoining spaces shortly after it docked at the Port of Miami,

Florida. It had just completed a daily 14-hour round-trip cruise to Freeport, Bahamas. Of the 530 passengers and 201 crewmembers on board, 1 passenger and 1 crewmember died from smoke inhalation, 4 persons received minor injuries, and 58 persons were treated for smoke inhalation. The damage to the vessel was estimated at $2.3 million (NTSB 1985c).

On July 30, 1986, the EMERALD SEAS, a Panamanian-registered passenger ship with 1,296 people aboard, was anchoring less than a mile offshore Little Stirrup Cay, Bahamas, when a crewmember saw thick, black smoke coming out of an engine department storeroom that contained acetylene, oxygen, argon cylinders, and plumbing materials. When the storeroom door was opened, more smoke poured out, so crewmembers retreated behind a watertight door. Shortly thereafter, there were two explosions and a fire. After about an hour the fire had been extinguished. U.S. Coast Guard helicopters evacuated 15 passengers and two crewmembers, who were taken to hospitals in Miami and treated for smoke inhalation and injuries. Damage to the ship was estimated at $300,000 (NTSB 1987a).

The accident involving the SCANDINAVIAN STAR (NTSB 1989) was described in the introduction to this report.

Fire on board vessels often crowded with passengers is one of the most serious threats to the safety of passengers and crewmembers. Although cruise passenger vessels may seem spacious, a fire often causes confusion and limited space is available in which to muster passengers should evacuation be necessary. Smoke may require moving large numbers of passengers to new muster locations and can cause extreme difficulties in evacuating accommodation spaces. Therefore, the Safety Board has made a number of recommendations to the U.S. Coast Guard to improve fire protection, fire detection, and fire extinguishment through the IMO regulation system.

Integrated Systems for Fire Protection

As a result of the SCANDINAVIAN SUN fire, the Safety Board determined that the navigating bridge was unmanned when the detection system signaled the fire. The vessel was equipped with an automatic/manual fire control system that integrated the smoke and heat detection system with other fire protection systems. The principle of the overall operation is that when the system is switched to automatic, the fire control system will, in the event of a fire, shut down the ventilation system and sound the alarm system to alert officers and crewmembers with firefighting responsibilities. Unfortunately during this fire, the control system was switched to manual. By the time the officer arrived on the bridge, 14 of 45 fire alarm zones on the fire detection panel were already indicating fire conditions. The officer quickly shut down the ventilation system and closed the fire doors; however, the fire had already entered a stair tower and had spread outside the tower onto two decks where passengers were gathering to disembark from the vessel. The effectiveness of the system was greatly diminished because the navigating bridge was not occupied. The closing of the automatic fire doors in the lobby by crewmembers prevented flames from spreading and further damaging the vessel and limited the number of passengers who suffered smoke inhalation. The delay in closing the automatic fire doors and in stopping

the ventilation, however, allowed the fire to enter the stair tower on one deck and toxic fumes to enter living spaces, where a passenger lost her life.

The Safety Board concluded that the fire could have been isolated earlier had the navigating bridge been manned or if the automatic/manual fire control system had been switched to automatic. The Safety Board issued the following recommendation to the Coast Guard:

> M-85-61
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> Propose to the International Maritime Organization an amendment to SOLAS 74 to require that all passenger ships carrying more than 36 persons on international routes have an automatic/manual fire control system in the pilothouse that integrates the fire detectors, the automatic fire door controls, the ventilation system controls, and the general alarm into a unified system.

The Coast Guard forwarded this recommendation to the IMO's Maritime Safety Committee as a U.S. agenda item, and it was referred to the Subcommittee on Fire Protection.[31] The United States proposed that the subcommittee consider amending the SOLAS 74 regulations so that ships carrying more than 36 passengers would be required to have smoke/fire detection alarms centralized in a manned location. In addition, the controls for closing the remote fire doors, for shutting down the ventilation in the affected areas, and for sounding the alarms would be centralized in the same location. Alternatively, the United States suggested that if the location could not always be manned, then these controls must be automatically activated by the detectors. Discussion was held at the 34th session of the Subcommittee on Fire Protection, Maritime Safty Committee of the IMO in February-March 1989; the issue of amending SOLAS 74 to require integrated systems was supported in the working group on passenger vessel fire protection by the United States, Denmark, Norway, Finland, and Poland. Several countries, however, found no compelling reason to require such systems on all passenger vessels, and the item was tabled for lack of support by the majority of the Administrations. The Safety Board continues to believe that passenger vessels need an integrated fire protection system.

In the last 2 1/2 years, the Coast Guard has looked at plans for 40 foreign flag passenger vessels entering the U.S. cruise market. Of that number, 6 were built to SOLAS 48 requirements, 11 were built to SOLAS 60, and 23 were built to current SOLAS 74 requirements. In SOLAS 74, existing vessels were required to comply with Part F, "Special Fire Safety Measures for Existing Passenger Ships," which added certain fire safety requirements. However, the full impact of SOLAS 74 and its 81/83 amendments have not been realized in 40 percent of the vessels entering or preparing to enter the U.S. cruise market. Indeed, some vessels use different SOLAS standards, (48, 60, or 74) depending on the fire protection requirements or the difficulty in

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[31] Agenda item 12, FP 33/12/4 dated November 24, 1987, for the 33d session of the Subcommittee on Fire Protection, IMO.

complying with the requirements. In February 1989, a Coast Guard official stated:

> It means we are seeing a trend toward more and more older ships coming into the U.S. market....This to me signals a potential retrograde shift in the safety continuum, a shift which causes me some discomfort....We must give recognition to the fact that in the rush to carry passengers where passengers are available and willing to pay, older ships, ships lower on the continuum of age and safety, are being pressed into service to meet the demand. The risks to the entire industry are self-evident....[32]

The Safety Board believes that passenger vessels, including foreign flag passenger vessels, operating in the U.S. cruise market must have integrated fire detection systems of the highest level. Therefore, the Safety Board believes that the U.S. Coast Guard should seek legislation directing passenger vessels operating out of U.S. ports to have an automatic/manual fire control system on the navigating bridge, a system that integrates the fire detectors, the automatic fire door controls, the ventilation system controls, and the general alarm. SOLAS 74, as amended, requires fire protection systems such as remote fire door releases, remote ventilation controls, general alarms, and fire detectors. However, these systems are not often integrated into a centralized system. For passenger ships, these systems can be integrated into a centralized system so that even if the control system's location is unmanned, the detection system can activate the door releases, ventilation controls, and the appropriate alarms without waiting for human action, thereby greatly minimizing the spread of fire, toxic smoke, and gases.

Therefore, as a result of this study, Safety Recommendation M-85-61, now classified as "Open--Acceptable Action," has been reclassified as "Closed--Superseded" by new Safety Recommendation M-89-124.

This new safety recommendation and other new recommendations concerning improvements in fire protection are made based on historical precedent. Major improvements in fire protection for foreign flag passenger vessels operating from U.S. ports and embarking U.S. passengers began in the 1960's after a series of fires onboard such vessels, most notably the YARMOUTH CASTLE. In 1966 and 1967, fire safety amendments to SOLAS were adopted by the IMO. However, these amendments were not incorporated into SOLAS 74 until 1980, 13 years later. In the intervening years, the United States took unilateral action to impose the 1966 and 1967 fire safety amendments. In 1968, the United States imposed the 1966 and 1967 standards on all passenger vessels operating from U.S. ports that were over 100 gross tons and had overnight accommodations for at least 50 passengers (Veentjer 1989). The Safety Board believes that new safety recommendations concerning improvements

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[32] Speech by Rear Admiral Sipes at Seatrend 89, Miami, Florida, during the week of February 27, 1989.

in fire protection, when acted on by the U.S. Coast Guard, will greatly improve the safety of foreign flag passenger vessels operating from U.S. ports and carrying U.S. passengers.

Automatic Ventilation System Shutdown

In three accidents investigated by the Safety Board (the SCANDINAVIAN SUN, EMERALD SEAS, and the SCANDINAVIAN STAR), large amounts of smoke traveled throughout the vessels, injuring passengers and crewmembers and, in the SCANDINAVIAN SUN accident, killing two people.

SOLAS 74 requires that power ventilation systems have two controls so that the fans may be stopped by operating either control, and stipulates that the controls should be situated as far apart as practicable.[33] In all three accidents, the ventilation systems continued to operate, spreading toxic smoke to living spaces and other areas of the vessels. By relying on the ship's personnel to stop power to ventilation systems in a fire emergency, the ventilation systems often continue to run during the emergency. For example, the SCANDINAVIAN STAR's ventilation fans and louvers on supply and exhaust vent ducts were not immediately closed, and smoke spread to the passageways, stairwells, into staterooms, and the two aft muster stations at the lounges, forcing passengers and crewmembers to move to other disembarkation areas.

The Safety Board, recognizing that automatic ventilation system shutdown would reduce the amount of smoke spreading through ships, particularly passenger ships, recommended that the U.S. Coast Guard:

> M-87-18
>
> Propose that the International Maritime Organization amend SOLAS 74 to require that smoke detectors be made a part of each local ventilation system to shut down the ventilation system automatically when the detector is activated to prevent the spread of smoke.

The Coast Guard forwarded this recommendation to the IMO's Maritime Safety Committee as a U.S. agenda item.[34] In the document, the United States stated that in the past, smoke detectors were not technically advanced. Today, cost, reliability, and accuracy have improved to the point that dampers and fans can be successfully controlled through local smoke detectors; therefore, the United States proposed that the Subcommittee on Fire Protection consider amending SOLAS 74 by requiring that smoke detectors be installed in ventilation ducts and connected to the power ventilation controls to automatically stop all fans in case of fire. Additionally, the

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[33] Regulation 32, "Ventilation Systems," SOLAS 74.

[34] Agenda item 12 FP 33/12/3 dated November 24, 1987, for the 33d session of the Subcommittee on Fire Protection, IMO.

United States proposed that all automatic fire dampers be equipped with smoke detectors arranged to close the damper in case of fire.

Discussion was held at the 34th session of the Subcommittee on Fire Protection, Maritime Safety Committee of the IMO; the issue of amending SOLAS 74 to require automatic ventilation system shutdown was supported in the working group on passenger vessel safety by Japan, Finland, and the United States. However, a larger number of Administrations--notably the United Kingdom, Canada, the Soviet Union, Liberia, Sweden, Norway, and the Netherlands--opposed the amendment.

The Safety Board continues to be concerned that automatic ventilation system shutdown is not a requirement for foreign flag passenger vessels entering the U.S. cruise market and believes that the U.S. Coast Guard should seek legislation that directs domestic and foreign flag passenger vessels operating out of U.S. ports to have automatic ventilation system shutdown.

Therefore, the Safety Board classified Safety Recommendation M-87-18 as "Closed--Superseded" on August 8, 1989, by Safety Recommendation M-89-44 issued as a result of the SCANDINAVIAN STAR accident (NTSB 1989). To reemphasize the Safety Board's concern about the issue, the recommendation is being reiterated to the Coast Guard as a result of this safety study.

M-89-44

Seek legislative authority to require that all passenger vessels operating from U.S. ports and embarking U.S. passengers, integrate smoke detectors into local ventilation systems to shut down the ventilation system automatically when the detector is activated to prevent the spread of smoke.

Further, all five accidents involving fires (ANGELINA LAURO, SCANDINAVIAN SUN, SCANDINAVIAN SEA, EMERALD SEAS, and the SCANDINAVIAN STAR) highlighted restriction to visibility resulting from large amounts of smoke being spread through the vessel by ventilation systems. For example, emergency lighting provided by the emergency battery power system offers limited visibility because the emergency lights are close to the ceiling of the passageways and are obscured by the smoke, which generally accumulates at high levels first. This concern has been addressed by the aviation industry: small, low power emergency lights are installed on the floor of all U.S. air carrier airplanes. In the entertainment industry, theaters have placed small, low power emergency lights on the floor to direct patrons to exits.

The Safety Board believes that the U.S. Coast Guard should propose to the IMO that small, low power emergency lights indicating the direction to safe exits be installed in at least the accommodation area passageways on all passenger vessels.

Automatic Fire Door Releases

In the SCANDINAVIAN SUN accident, the Safety Board concluded that the fire could have been prevented from entering the stair tower on one of the decks if the ship had been equipped with automatic fire door releases activated by a heat or smoke detector. Additionally, delay in closing the fire doors and the delay in stopping the ventilation allowed the fire to enter the stair tower and toxic fumes to enter living spaces where a passenger lost her life. As a result, the Safety Board recommended that the U.S. Coast Guard:

> M-85-60
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> Propose to the International Maritime Organization an amendment to SOLAS 74 to require that heat or smoke detectors be made a part of each automatic fire door release switch on passenger ships so that the door will close when the detector is activated.

The issue was forwarded to the Maritime Safety Committee.[35] The U.S. position paper stated that automatic fire doors should be operated quickly in the event of a fire to prevent the spread of fire. Currently, IMO regulation II-2/30.4 requires that self-closing fire doors be operated from a remote location, usually the navigating bridge, as well as a location adjacent to the door. In most of the fires, there is a time delay between the start of the fire and a response by the crew--a critical time when fire and its products can travel through open fire doors, negating some of the value of the fire door. By making doors close automatically, independent of an action by a crewmember, the speed of door closure would increase, the need for human action decrease, and the rate of spread of noxious smoke and hot gases would decrease. The United States proposed that the Subcommittee on Fire Protection consider amending regulation II-2/30.4 by adding a new sentence after the existing third sentence as follows:

> In addition, all self-closing doors shall be equipped with heat or smoke detectors that will actuate the door release.

Discussion was held at the 34th session of the Subcommittee on Fire Protection, Maritime Safety Committee of the IMO; the issue of amending SOLAS 74 to require automatic fire door release was supported in the working group on passenger vessel fire safety by the Netherlands, Japan, Finland, the United States, and France. However, the consensus of the other Administrations--most notably Norway (an alarm to bridge should suffice), Denmark (problems with automatic fire door releases), Sweden (emphasis on training and drills)--and negative votes by the Soviet Union, Poland, Italy, and Canada resulted in the agenda item being voted down.

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[35] Agenda item 12, FP 33/12/2 dated November 24, 1987, for the 33d session of the Subcommittee on Fire Protection, IMO.

The Safety Board, however, continues to believe that the technology, cost, reliability, and accuracy of local automatic heat and smoke activated release mechanisms at fire door locations can add an additional needed level of safety on passenger vessels. Therefore, the Safety Board believes that the U.S. Coast Guard should seek legislation that directs passenger vessels operating out of U.S. ports to have automatic fire door releases actuated by heat and/or smoke detectors.

Therefore, as a result of this study, Safety Recommendation M-85-60, now classified as "Open--Acceptable Action," has been reclassified as "Closed--Superseded" by new Safety Recommendation M-89-125.

Firefighting Training and On-Board Drills

As a result of the fires on the ANGELINA LAURO, SCANDINAVIAN SUN, SCANDINAVIAN SEA, EMERALD SEAS, and SCANDINAVIAN STAR, the Safety Board believes that action must be accelerated to improve the firefighting readiness of crews on foreign flag passenger vessels.

In the case of the Italian vessel ANGELINA LAURO (NTSB 1980b), the Safety Board concluded the following:

- Effective control and coordination of shipboard firefighting by the crew was never established.
- The ship's officers and crewmembers were not adequately trained to fight the type of fire that developed on the ANGELINA LAURO. Improved training in firefighting must be emphasized on passenger vessels with combustible materials in their construction.
- Fire drills conducted for the Coast Guard examination do not adequately test a crew's firefighting capability or ensure that an effective firefighting effort can be mustered on passenger vessels.

In its investigation of the SCANDINAVIAN SEA accident, the Safety Board concluded that in the early hours of the fire after the vessel had berthed at the cruise terminal, there was confusion aboard the vessel about who was in charge of firefighting (NTSB 1985a). In its investigation of the SCANDINAVIAN SUN accident, the Safety Board concluded that several actions by the crew could have prevented the fire's spread, indicating the need for improved training and drills (1985c). In the EMERALD SEAS accident, the delay in taking positive action to control the spread of smoke directly led to smoke inhalation that caused injuries to 38 passengers and 1 crewmember, and that almost proved fatal to two passengers (NTSB 1987a). In the SCANDINAVIAN STAR accident, failures by the crewmembers indicated a lack of emergency fire procedures (NTSB 1989).

Two of the accidents led the Safety Board to make the following recommendations to the U.S. Coast Guard:

> M-80-107
>
> Develop and implement more stringent requirements for conducting fire drills on passenger vessels operating under its Control Verification Program to determine the crew's familiarity with shipboard fire protection features and their firefighting preparedness.
>
> M-85-31
>
> Under the Control Verification Program for foreign passenger ships calling at United States ports and embarking U.S. citizens as passengers, conduct more comprehensive examinations of the fire and emergency equipment and safety procedures aboard vessels.

The Coast Guard took action to implement the intent of the recommendations (both are classified as "Closed--Acceptable Action") and forwarded them to the Maritime Safety Committee, IMO, as a U.S. agenda item.[36] The United States proposal was detailed and included the need for organization, the reasons for conducting training and drills, and guidelines for executing an improved on-board training and drill program (the text of the proposal is in appendix F).

At the 34th session of the Subcommittee on Fire Protection, Maritime Safety Committee of the IMO, an agenda item from Denmark was discussed that proposed text for a new amendment to SOLAS 74 in keeping with the earlier proposal from the United States.[37] The working group on passenger vessel fire safety fully supported the Danish and U.S. positions, and a new regulation, II-2, was forwarded to the full Maritime Safety Committee to include in the SOLAS convention. In addition, the working group drafted an MSC circular so that such drills and training should be instituted as soon as possible. The proposed regulation includes sections on fire drills, on-board training and instructions, availability of fire-extinguishing appliances, and recordkeeping requirements (the text of the draft is in appendix G).

The Coast Guard is giving considerably more attention to emergency drills in the Control Verification and Examination program. Emergency fire

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[36] Agenda item 12, FP 33/12/6 dated January 8, 1988, for the 33d session of the Subcommittee on Fire Protection, IMO.

[37] Agenda item 10, FP 34/10/8 dated January 3, 1989, for the 34th session of the Subcommittee on Fire Protection, IMO.

drills on the Bahamian vessel TROPICANA held in December 1988 demonstrated the Coast Guard's attention to this safety issue. In a memorandum to the Commandant, the Commanding Officer, Marine Safety Office-Miami, found demonstration of the crew's skills and knowledge during emergency drills "...particularly distressing...."[38] The Safety Board staff was also concerned by the poor performance of the crew when it reviewed videotapes of several safety exercises on board the TROPICANA during a series of Coast Guard examinations. This was a vessel preparing to operate immediately in the cruise-to-nowhere market with 1,200 U.S. passengers and 125 crewmembers.

The Coast Guard had to expend considerable resources in repeatedly drilling the crew of the TROPICANA so that the vessel could pass examination. During preparation of this report, the Safety Board staff was informed by the Coast Guard, Miami office, that another vessel had similar difficulties with emergency fire drills. The Safety Board does not believe the Coast Guard should be the sole quality control function for the foreign flag passenger vessel industry that operates from U.S. ports, particularly for fire and lifesaving drills. The Safety Board believes that the flag Administrations and their representatives also have a responsibility to provide crews on large passenger vessels that can properly demonstrate and execute emergency drills.

The proposed IMO regulations to include fire drills will afford an improved level of preparedness on board foreign flag passenger vessels. However, the Safety Board remains concerned about the training in firefighting. As a result of the investigations of past accidents and this study, the Safety Board is not confident that the senior and safety officers of some foreign flag passenger vessels have the requisite skills in firefighting and fire safety measures unless they have received some detailed, comprehensive, and periodic training. Additionally, firefighting training in a structured environment would increase crewmembers' abilities to fight fire, and some cruise lines--such as Carnival Cruise Lines--require crewmembers with firefighting responsibilities to take additional training. However, this is not the rule for the industry.

The Safety Board believes that the industry should consider establishing a full-time professional marine firefighter position on all passenger vessels that carry more than 500 passengers. Several of the larger foreign flag passenger vessels have such firefighters. An individual trained in marine firefighting would be able to train the ship's personnel on board and to inform crewmembers transferring from other vessels of the fire safety features of the ship on which they are now serving.

The IMO requires that fire control plans be available for a vessel's officers, either posted or in a booklet form. There is no requirement that a firefighting training manual be provided to the crewmembers responsible for firefighting so that they would be better prepared in an emergency. The

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[38] Memorandum dated January 17, 1989, from Commanding Officer, Marine Safety Office-Miami, to the Commandant regarding Initial Control Verification for TROPICANA (C/S C6DQ6), a Bahamian flag passenger vessel.

recent Control Verification Examination of the TROPICANA was indicative of the need for a firefighting training manual for crewmembers addressing basic, emergency firefighting requirements: the crew could not accomplish a reasonable fire drill in a nonsmoke situation. Chapter III of the SOLAS regulations, "Life-Saving Appliances and Arrangements," requires a detailed lifesaving training manual that contains instructions and information on lifesaving appliances provided in the ship and on the best methods of survival (Regulation 51, "Training Manual"). The Safety Board believes a detailed companion training manual should be required for firefighting and its requisite equipment for the engineroom, all accommodation and public spaces, and any locations where fire hazards exist--such as in storage and paint lockers, particularly where hazardous materials are stored.

The Safety Board staff reviewed the training manuals of the Carnival Cruise Lines provided by the Director of Marine Operations and the manual of Kloster Cruise Limited for the Norwegian vessel ROYAL VIKING SUN. Both manuals were detailed and met the intent of the SOLAS regulation for life-saving concerns. These manuals were available for ship's officers. Detailed manuals for use by crewmembers with firefighting responsibilities were not available.

The level of training and information provided to crewmembers with firefighting responsibilities varies. In firefighting drills reviewed by the Safety Board, no use was made of artificial smoke to simulate more realistically the fire scenario. The Carnival Cruise Lines requires its crewmembers with firefighting responsibilities to take practical marine fire training. According to the Director of Marine Operations, these crewmembers take a course on marine firefighting from a recognized training institution such as the APT Antincendio s.r.l. (Italian), the Seaman's Church Institute of New York & New Jersey, or the Miami-Dade Community College. Kloster Cruise Limited has paid firefighters on board some of its vessels, and these firefighters provide their expertise on fire safety concerns and improvements for other Kloster vessels. However, not all companies operating foreign flag passenger vessels take the time or have resources to provide such training initiatives, particularly companies operating in the cruise-to-nowhere market where the turnover rate of crewmembers is high. The Safety Board believes, therefore, that the U.S. Coast Guard should propose to the IMO the need for a firefighting manual for use by crewmembers that details the elementary actions that should be taken to minimize the spread of a fire and smoke so that crewmembers with firefighting responsibilities will know the actions to take prior to an actual emergency. For example, all crewmembers should know to whom a fire should be immediately reported. During the initial Control Verification Examination of the ROYAL VIKING SUN that Safety Board staff observed, Coast Guard personnel asked many room attendants, all of whom spoke English satisfactorily, to whom they would report a fire; some knew and others did not.

Sprinkler Systems for Accommodation, Control, and Service Spaces

As a result of its investigation of the SCANDINAVIAN SEA accident (NTSB 1985a), the Safety Board concluded that an installed sprinkler system would have extinguished the fire in its early stages. The Safety Board recommended that the U.S. Coast Guard:

> M-85-34
>
> Expedite U.S. rulemaking and seek international agreement to require all passenger vessels to have a sprinkler system installed in accommodation areas regardless of the type of fireproof construction used.

The Coast Guard forwarded this recommendation to the IMO Maritime Safety Committee as a U.S. agenda item.[39] The U.S. position was detailed and based on the current U.S. requirements for sprinkler systems on U.S. vessels detailed in 46 CFR Subchapter H, "Passenger Vessels." The Coast Guard requires automatic sprinkler systems for all vessels with berths or staterooms for 50 or more passengers, and control and service spaces such as photographic labs and print shops.

At the 34th session of the Maritime Safety Committee of the IMO, Subcommittee on Fire Protection, the working group on passenger fire safety discussed automatic sprinkler systems in accommodation and service spaces on all passenger vessels carrying more than 36 passengers. In principle, most Administrations (United States, United Kingdom, Denmark, Japan, Norway, Sweden, Poland, Liberia) favored making this a requirement for new vessels. The Soviet Union opposed automatic sprinkling systems. However, a number of concerns were raised:

- Some Administrations could not support sprinkler installation in some specific locations, such as control spaces, corridors, and stairways;
- Some Administrations believed that sprinklers should only be installed in some specific locations; for example, atriums, staterooms, restaurants, or other spaces of high fire risk.
- Some Administrations believed that the provision of a sprinkler system should not eliminate the installation of detection and alarm systems.

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[39] Agenda item 12, FP 33/12/1 dated November 24, 1987, for the 33d session of the Subcommittee on Fire Protection, IMO.

The working group recognized that such a change would ultimately result in a single concept in the design of passenger vessels; that is, all passenger ships would be built with both detection systems and sprinkler systems installed, eliminating the current system of different fire construction "methods" discussed in Chapter 20, "Examinations of Foreign Vessels Subject to SOLAS," in the U.S. Coast Guard Marine Safety Manual. The three current methods of fire construction, according to the Marine Safety Manual, are as follows:

> Method I. This is the only method of three SOLAS convention methods based on extensive fire test experience aboard vessels, according to the U.S. Coast Guard. The primary reliance with Method I is on containment of the fire to the space of origin by suitable structural and thermal boundaries. Combustibles are minimized. In Method I, the objectives of separating the accommodation spaces from the remainder of the vessel by thermal and structural boundaries, and the protection of the means of escape, are inherent in the system. The expenditure of effort in dealing with the fire problems under this method is entirely addressed in the construction state of the vessel. This method has been most effective in keeping fires on vessels from becoming a serious problem. The Coast Guard believes that no passenger lives have been lost due to a fire on U.S. passenger vessel since the accident of the MORRO CASTLE in 1946 (there are, however, few large U.S. passenger vessels). Records prior to 1946 are difficult to substantiate.
>
> Method II. Method II uses automatic sprinkler systems as the first line of defense in combating fires. There is very little restriction on the quantity of combustible materials that can be installed on a vessel constructed by this method. The vessel NORWAY (ex FRANCE) is a good example of this method. The U.S. Coast Guard believes Method II has many problems and highlights them as follows:
>
> - The first line of defense may not be effective because of mechanical failure of the system.
> - A fire may start in the space containing the sprinkler pumps, rendering the system totally inoperative.
> - As spaces in a vessel change character, a space originally without sprinklers may be converted to stowage of combustibles, and a change in the sprinkler system may not keep pace with the change of space.

- The Coast Guard has found that the secondary lines of defense play a major role in Method II; that is, reliance on main vertical zones and class "A" bulkheads. (Class A bulkheads originated in Method I and were the result of extensive fire testing based on very limited amounts of combustibles.)

Method III. In Method III, the primary reliance is placed on early detection of the fire by an installed detection system and prompt firefighting action on the part of the crew. Fire detection systems as seen in the Safety Board's investigation of the SCANDINAVIAN SUN and in other accidents cited by the Coast Guard--the LAKONIA, QUEBEC, and the RIO JACHAL were ineffective. The Safety Board's investigation of the SCANDINAVIAN STAR illustrated the difficulties in relying on prompt firefighting action by the crew. Once the fire is out of control, large amounts of smoke exacerbate the situation and place passengers and crew in danger. Method III has two major problems: the mechanical element of the fire detecting system and the human element of the crew's ability to extinguish the fire in its early stage.

Although the working group on passenger vessel fire safety agreed with the U.S. proposal, the group decided that in-depth examination of the ramifications and details of such a universal design should be discussed further at the next session of the Subcommittee on Fire Protection.

The Safety Board believes that a single concept incorporating integrated fire protection systems that include automatic sprinkling systems in accommodation spaces should not be difficult to achieve. Clearly the continued occurrence of fires on passenger vessels operating from U.S. ports with U.S. passengers should be prevented. The documented record is not good and there is reason to believe that other fires involving passengers vessels have gone unreported to the Coast Guard. For example, previously unknown fires on the SCANDINAVIAN STAR were revealed during the Safety Board's public hearing. Therefore, the Safety Board believes that the U.S. Coast Guard should strongly urge the IMO to develop a single, universal method of fire protection, fire extinguishment, and fire detection system that incorporates the best components of the three current construction methods. Sprinkler systems should be a mandatory requirement for all passenger vessels operating from U.S. ports and embarking U.S. passengers.

Therefore, Safety Recommendation M-85-34 has been classified as "Closed--Superseded" by new Safety Recommendation M-89-126.

Hose Ports

During the fire aboard the passenger vessel SCANDINAVIAN SEA, the extreme heat of the fire forced the firefighting teams to retreat. Fire hoses were left behind, blocking fire doors open, and smoke and hot gases traveled through uninvolved portions of the vessel. In fighting fires aboard vessels, fire hoses are usually connected to hydrants outside the fire area, which entails fire hoses being pulled through fire doors to reach the fire. The Safety Board reviewed the possibility of hose ports in the fire doors; the rationale was that if hose ports had been installed in the fire doors, the main vertical zone in which the fire was contained could be sealed effectively, restricting the air supply to the fire. Additionally, in the event of a hasty retreat, not uncommon in serious fires, the fire doors would not be left open if hose ports were required. As a result of the fire on the SCANDINAVIAN SEA (NTSB 1985a), the Safety Board recommended that the U.S. Coast Guard:

> M-85-33
>
> Amend U.S. regulations and seek international agreement to require passenger ships to be provided with hose ports in all fire doors so that they may be fully closed when fire hoses have to be led through fire doors.

The Coast Guard conducted a series of fire tests in 1986 and 1987 on four Class A-15 marine fire doors:[40] three with hose ports and one without for control. The Class A-15 marine fire doors were installed in Class A-60 bulkheads; the 1-hour fire tests were conducted according to the American Society for Testing and Materials E152 Standard for Fire Tests of Door Assemblies. The tests demonstrated that hose ports do not degrade the structural fire protection of fire doors.

Hose ports are described in the regulations of Subchapter H, "Passenger Vessels," but are not permitted to be installed in fire doors of main vertical zone boundaries. The Coast Guard's reply to this recommendation,

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[40] "A" class divisions comply with the following (International Maritime Organization 1986): (1) they will be constructed of steel or other equivalent materials; (2) they will be suitably stiffened; (3) they shall be constructed as to be capable of preventing the passage of smoke and flame to the end of the one-hour standard fire test; and (4) they shall be insulated with approved noncombutible materials such that the average temperature of the unexposed side wall will not rise more than 130 °C above the original temperature, nor will the temperature, at any one point, including any joint, rise more than 180 °C above the original temperature, within the time listed below:

Class A-60	60 minutes
Class A-30	30 minutes
Class A-15	15 minutes
Class A-0	0 minutes

dated August 21, 1985, concurred with the intent. However, they disagreed with the Safety Board's conclusion that hose ports, if installed, would maintain the fire resistance levels required by the fire doors. The Safety Board classified the recommendation as "Open--Unacceptable Action."

The Coast Guard forwarded the safety recommendation to the Maritime Safety Committee as a U.S. agenda item.[41] Additionally, the United States submitted to the Subcommittee on Fire Protection, Maritime Safety Committee, for distribution, the report "Fire Aboard the M.S. SCANDINAVIAN SEA on March 9, 1984, Technical Assessment" (FP 33/inf.10). The report included results of the fire tests conducted by the Coast Guard supporting the positive nature of hose ports. The United States proposed amending the SOLAS 74 regulations as follows:

> .1 Amend regulation II-2/30 by adding a new regulation 30.7:
>
> > ".7 All doors other than those in watertight divisions shall be equipped with a hose port of a square shape approximately 15 centimeters on a side."
>
> .2 Amend regulation II-2/47 by adding a new regulation 47.5:
>
> > ".5 All class A doors other than those in watertight divisions shall be equipped with a hose port of a square shape approximately 15 centimeters on a side."

Discussion on hose ports in the working group on passenger vessel fire safety resulted in the agenda item being forwarded to the next session with a request for more detailed information concerning construction and installation, operational experience on existing vessels (hose ports have been installed on tankships), and the effect of hose ports on fire and smoke integrity of the door.

The Safety Board continues to believe that hose ports should be fitted in fire doors on U.S. and foreign flag passenger vessels, including doors in the main vertical fire zone boundary, so that an area under attack by firefighters could be sealed off. Such hose ports would also minimize smoke and hot gases from escaping to another zone because fire doors would not be blocked open by hoses.

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[41] Agenda item 12, FP 33/12 dated November 23, 1987, for the 33d session of the Subcommittee on Fire Protection, IMO.

Therefore, as a result of this study, Safety Recommendation M-85-33 has been reclassified as "Closed--Unacceptable Action/Superseded" by new Safety Recommendations M-89-127 and M-89-134.

Removal of Unlined Linen Fire Hoses

Fire hoses are one of the most critical firefighting systems aboard a vessel. Unlined linen fire hoses, the predominant type on foreign flag passenger vessels, are made of finely woven flax fibers that swell in contact with water. The swelling makes the hoses watertight. If the hoses are not meticulously dried, however, the linen remains waterlogged and mildew sets in, destroying the fibers and weakening the hoses to the point of failure. Fire hoses can become wet from several sources: firefighting, hydrostatic testing, and from leaky valves. Unless unlined fire hoses are completely dried, deterioration begins immediately.

The United States has prohibited the use of unlined linen fire hoses on commercial vessels in machinery spaces since 1961 and for all uses since 1980. Fire hoses required to be installed on U.S. vessels must be lined or the equivalent.[42] Usually the lining is synthetic rubber, although some manufacturers have developed fire hoses made of synthetic polymeric fibers that are immune to mildew attack. These fire hoses are superior to the unlined linen fire hoses, and the U.S. Coast Guard has seen few failures on U.S. flag vessels. Additionally, the labor, time, and other costs--such as the provision of drying cabinets required to properly maintain and service the unlined fire hose after each use--outweighs the higher initial cost of lined linen hoses.

The U.S. Coast Guard has found deteriorated unlined linen fire hoses in both Control Verification Examinations and accident investigations on foreign flag vessels.

In 1987, the United States presented to the Maritime Safety Committee an agenda item urging the IMO to develop specifications in SOLAS 74 for fire hose construction.[43] The United States took the position that unlined fire hoses present unacceptable risks and recommended that no fire hose be made of unlined linen and that all fire hoses be lined or made of an equivalent material that resists mildew and resultant rotting. The Safety Board supports the U.S. position and believes lined linen fire hoses or the equivalent should be required for any vessel operating from a U.S. port and embarking U.S. passengers. If the IMO does not finalize the improved specifications for fire hoses on foreign flag passenger vessels operating from U.S. ports, the Safety Board believes that the U.S. Coast Guard should seek legislative authority to require lined linen fire hose on all passenger vessels regularly operating from U.S. ports.

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[42] 1146 CFR 76.10-10, "Fire Hydrants and Hose."

[43] Agenda item 7, FP 33/7 dated November 24, 1987, for the 33rd session of the Subcommittee on Fire Protection, IMO.

Open Areas and Atriums

Several vessels under construction or design and one currently operating (SOVEREIGN OF THE SEAS) have new design features: large, open areas and atriums. These features are taken from the land-based hotel market; the open space sometimes comprises five to seven decks. Generally these areas include a "grand" staircase, exposed elevators with lights, shops, restaurants, snack bars, lounges, cafes, and other arrangements. The Coast Guard took action in the instance of the SONG OF AMERICA to require additional fire protection, such as automatic sprinklers and additional means of escape, because of the increased number of passengers that could use such space.

SOLAS 74 has no regulations that address these new design features. Ship designers in Finland, France, West Germany, and other countries are completing or executing such designs. Because of the threat of multiple deck fires and the possibility of a vessel burning through the center, where most atriums are located, the United States recommended amendments to SOLAS 74 in 1989.[44] The amendments called for standards closely following those for the land-based hotel industry, including but not limited to automatic sprinkler systems, smoke detectors, increased smoke extraction system, fire barriers at all deck levels that meet at least a 1-hour standard, tempered glass, and fire-resistant materials. The United States also requested a definitive statement on the means of escape for the increased number of passengers who would need to exit such large, open spaces or atriums.

The working group on passenger vessel fire safety recognized the importance of this concern and drafted a Marine Safety Committee Circular recommending improvements in the safety of large, open areas: a smoke detection system, a smoke extraction system, two means of escape, and automatic sprinkler system.[45]

The working group urged prompt action. At the Subcommittee meeting, delegations from Greece, China, Ecuador, Mexico, and India expressed that the proposed amendments related to large spaces and on-board training and drills were not "compelling" and that a cost assessment had not been conducted as expressed in IMO resolution A.500 (XII). The United States responded that the proposed amendments were compelling because (1) the United States is the host nation for most of the foreign flag passenger vessels and the issue of open spaces is already a problem with designers, shipbuilders, and shipowners awaiting guidance; and (2) the United States has a responsibility for protection of passengers embarking from U.S. ports through its Control Verification and Examination Program, which will address open spaces, fire

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[44] Agenda item 10, FP 34/10/13 dated January 27, 1989, for the 34th session of the Subcommittee on Fire Protection, IMO.

[45] Agenda item 10, FP 34/WP.4 dated March 1, 1989, for the 34th session of the Subcommittee on Fire Protection, IMO. The text of this proposed MSC circular is presented in appendix E.

drills, and training. The United States, Norway, Denmark, Sweden, Finland, Italy, France, and Liberia believed the proposed amendments to SOLAS were justified. The proposed amendment relating to large, open spaces and its companion Marine Safety Circular will be discussed at the 1990 meeting of the Subcommittee on Fire Protection.

Shoreside Fire Contingency Planning

Fire safety issues at shoreside were addressed in two accidents investigated by the Safety Board: ANGELINA LAURO and the SCANDINAVIAN SUN. The issues focused on the need for a port contingency plan for emergency response, the need to schedule periodic drills so that shoreside firefighters would be familiar with a vessel's interior, and an improved level of communication and cooperation between the port and passenger vessels calling at U.S. ports.

In its report on the ANGELINA LAURO, the Safety Board concluded that the Coast Guard had not ensured that the port of Charlotte Amalie, U.S. Virgin Islands, had an effective contingency plan to assist in fighting a fire on passenger vessels calling at the port. Additionally, the firefighting efforts of the Virgin Islands fire department were ineffective, and these firefighters had not been adequately trained to render effective firefighting service on large passenger vessels. In the SCANDINAVIAN SUN accident, the Safety Board concluded that the lack of coordination between the vessel's officers and the firefighters and the absence of a port contingency plan caused an unnecessary delay in the firefighting operation after the vessel arrived at the cruise terminal at Port Canaveral, Florida.

The Safety Board issued a series of recommendations to the Coast Guard, specific port authorities (Port Canaveral and the Virgin Islands), and specific vessel owners to improve planning and communications. These recommendations were classified by the Safety Board as "Closed--Acceptable Action" or "Closed--Acceptable Alternate Action."

Since the Safety Board closed these recommendations, one master who had operated several foreign flag passenger vessels in the cruise-to-nowhere market in another port location stated that there had been little planning or communications between port firefighters and vessels under his command.

The accidents highlight a serious safety issue appropriate to other port areas in the United States. The National Fire Protection Association (NFPA), Technical Committee on Fire Service Training, drafted a document identifying the elements of a comprehensive marine firefighting response program, including but not limited to vessel familiarization, training considerations, and pre-fire planning and special hazards (National Fire Protection Association, in press). The proposed program will help land-based firefighters extinguish vessel fires at port locations safely and efficiently.

This proposed practice for firefighters, a result of Safety Board and Coast Guard recommendations, and the work of technical experts of the National Fire Protection Association, will be addressed at NFPA's fall 1989 meeting.

The Coast Guard, in its April 6, 1989, comments on the NFPA document, recommended that the proposed NFPA practice inform U.S. land-based firefighters of the international regulations on fire control plans for foreign flag passenger vessels. SOLAS Regulation 20 requires placement and marking of fire controls on vessels for land-based firefighters. Additionally, Maritime Safety Circular 451 of the IMO provides guidance to vessels to have those plans where land-based firefighters can easily locate them. Also, the Coast Guard has recommended that standard symbols proposed by the IMO be used on all fire control plans for marine applications. The standard symbols could be referenced in NFPA's proposed firefighting practice. The Safety Board supports adoption of NFPA's proposed practice and believes that the U.S. Coast Guard should again provide necessary guidance on marine firefighting after approval of the proposed practice. Certainly this document will be of great assistance to shoreside firefighters who are not familiar with passenger vessels or how to handle shipboard fires.

CHAPTER 9

PASSENGER EMERGENCY DRILLS

In the report on the SCANDINAVIAN SUN accident, the Safety Board highlighted that foreign flag passenger vessels making short voyages (less than 600 miles) are not required by an international or national authority to hold emergency drills (fire or lifesaving) involving passengers nor is there a requirement to brief passengers face-to-face on emergency procedures. The only IMO requirements are found in the SOLAS chapter on lifesaving; Regulation 18, "Abandon Ship Training and Drills," states that "on a ship engaged on a short international voyage, if a muster of passengers is not held on departure, the attention of the passengers shall be drawn to the emergency instructions required by regulations 8.2 and 8.4." Regulation 8.2 states that "clear instructions to be followed in the event of an emergency shall be provided for every person on board"; Regulation 8.4 states that "illustrations and instructions in appropriate languages shall be posted in passenger cabins and be conspicuously displayed at muster stations and other passenger spaces to inform passengers of...their muster station;...the essential actions they must take in an emergency;...the method of donning life jackets."

The only safety information provided to passengers on many foreign flag passenger vessels is that displayed or written on boarding cards (examples are in appendix H), in poster displays, and in announcements on the public address system. On longer international voyages, passengers are required to participate in a drill within 24 hours after embarkation. The Safety Board believes that safety orientation drills should be required on all voyages--short, long, or cruise-to-nowhere. In its report on the SCANDINAVIAN SUN accident, the Safety Board outlined the elements that it believes should be uniformly addressed on all voyages. As a result of the accident, the Safety Board recommended that the U.S. Coast Guard:

> M-85-59
>
> Propose to the International Maritime Organization an amendment to SOLAS 74 to require that passenger ships on short international voyages conduct drills or safety orientations for passengers at muster stations immediately upon departure from port. Safety orientation briefings should include a demonstration on the donning of life preservers, evacuation or disembarkation routes, information concerning the function of automatic fire doors, and actions to take in the event of a fire or other emergency.

The Coast Guard replied on November 11, 1985, that it concurred with the recommendation but cited the SOLAS requirements, requirements that did not meet the intent of the recommendation. The Safety Board classified the recommendation as "Open--Unacceptable Action."

The Safety Board continues to believe that the Coast Guard must address this recommendation. Nearly 50 percent of the foreign flag passenger vessels seeking entry into the U.S. cruise market in the last 2 1/2 years are generally older, modified passenger vessels; the safety of passengers on these vessels can be enhanced by the addition of a face-to-face safety orientation at muster locations or an emergency drill. Most of these vessels sail short international voyages, and face-to-face safety orientation at muster locations or an emergency drill are not provided for passengers.

Therefore, the Safety Board reiterates Safety Recommendation M-85-59 to reemphasize the Safety Board's belief that all passenger vessels on short international voyages must conduct drills or safety orientations for passengers at muster stations immediately on departure from port.

CHAPTER 10

LANGUAGE BARRIERS

Language barriers, both among crewmembers, and between crewmembers and passengers, were evident in the Safety Board's investigation of the SCANDINAVIAN STAR accident. One of the findings in this accident was that because of a language barrier between the watch engineer (Philippine) who spoke and understood English and Tagalog and the watch motorman (Honduran) who spoke and understood Spanish, effective action was not taken to immediately halt the flow of fuel oil feeding the fire which started in the main engine room. The Safety Board also concluded that the selection and training of officers and crewmembers should be based partly on their ability to read and understand operating and safety instructions for the vessel and on their ability to communicate with each other. Such abilities are increasingly important when foreign flag vessels are manned by crewmembers and officers from many countries; the SCANDINAVIAN STAR, for example had crew representing 27 countries.

The Safety Board's review of the initial Control Verification Examination of the TROPICANA and videotape of emergency drills highlighted that language barriers between crewmembers may play a pivotal role in the success or failure of fighting a fire and evacuation of a vessel. In the TROPICANA'S case, critical tasks were assigned to crewmembers who could not understand each other. The videotape revealed that great reliance was placed on hand signals to effect emergency procedures in the preparation to launch liferafts.

Many foreign flag passenger vessels have senior officers from one country, which facilitates communication and the decisionmaking process among senior deck and engine officers. There can be difficulties, however, in translating orders down the line to crewmembers who cannot speak the same language as deck officers. For example, in the SCANDINAVIAN STAR accident, a motorman who spoke Spanish had to communicate with an officer who spoke Tagalog; in lifesaving drills of the TROPICANA viewed on videotape, a mate who spoke Polish had to communicate with a liferaft launch team who spoke Spanish and understood no commands in Polish.

Passengers on board the SCANDINAVIAN STAR stated that communication problems between the crew and passengers were a major concern during the emergency involving fire and smoke. The following statements summarize remarks made by passengers:

> Most crewmembers we encountered could not speak or understand English. Some of the supervisors spoke English, but they were not always available.
>
> The few [crewmembers] who spoke English attempted to organize and comfort the passengers, but the others [non-English speaking crew] got in the way. Some crewmembers could not understand each other.

> [There was a need for] crewmembers who could understand each other.
>
> The firefighting activities were confusing; nobody spoke English so instructions were gestures, not spoken.
>
> A lot of [the] crew did not speak English, which was a problem.
>
> Communication with most of the crew was almost impossible because [their] command of English was minimal.

The Safety Board believes that foreign flag passenger vessels operating from U.S. ports with U.S. passengers who predominately speak English (generally 90 to 95 percent of the passengers on such vessels speak English) should ensure that crewmembers in charge of emergency muster stations and watchstanders speak and read English in order to understand emergency procedures and direct emergency evacuations. The Safety Board believes that the Coast Guard should reflect this concern in its Control Verification Examination and emphasize in its Marine Safety Manual actions its inspectors should take to assess and monitor the communication skills of those crewmembers in critical lifesaving functions such as firefighting, watchstanding, and emergency evacuation. Secondly, if the crew does not demonstrate the ability to communicate with each other in the Coast Guard's Control Verification Examination, then the foreign flag passenger vessel should not be allowed to operate from U.S. ports embarking U.S. passengers until such language barriers are effectively removed through training or new crew assignments. Therefore, the Safety Board urges the Coast Guard to monitor communications during drills on lifesaving, firefighting, and other emergency procedures in its Control Verification Examinations of vessels on which crewmembers speak different languages to determine the crew's ability to interact with each other and to interact with U.S. passengers who predominately speak English.

Although the U.S. Coast Guard does address language requirements for U.S passenger vessels of at least 100 gross tons, guidance is provided in 46 CFR 15.730, "Language Requirements," that cites 46 USC 8702 in part:

> (b)46 U.S.C. 8702(b) requires that on board vessels departing U.S. ports 75 percent of the crew in each department on board is able to understand any order spoken by the officers.

The Coast Guard in the regulation (46 CFR 15.730) states that the words "able to understand any order spoken by the officers" relates to any order to a member of the crew when directing the performance of that person's duties and orders relating to emergency situations such as used for response to a fire or in using lifesaving equipment. Regarding past regulations,[46] the Coast Guard was more explicit stressing that even waiters, seamen, or other-

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[46] 46 CFR 157, October 1,1987.

employees who are assigned emergency or lifeboat work were expected to understand orders for such emergency or lifeboat service. Further, the Coast Guard stated that these orders should be given directly by the officers to each crewmember, not through an interpreter or interpreters, signs, gestures, or signals. The Safety Board believes that the discussion in the Code of Federal Regulations on language requirements for U.S. vessels is germane to the language barriers observed during this study and investigation of the SCANDINAVIAN STAR accident. As a result of that accident, the Safety Board issued the following recommendation (classified as "Open--Awaiting Response") on August 8, 1989, to SeaEscape, the owner/operator:

> M-89-59
>
> Require that officers and crew of passenger ships are able to communicate with each other and with a majority of the passengers.

The Safety Board believes that language barriers between crewmembers and between crewmembers and passengers pose serious concerns on many foreign flag passenger vessels operating from U.S. ports and that owners/operators of these vessels need to address these concerns.

Therefore, the Safety Board believes that the U.S. Coast Guard should take actions to eliminate language barriers on foreign flag passenger vessels operating from U.S. ports and embarking U.S. passengers. Action can be taken by strengthening guidance in the U.S. Coast Guard's Marine Safety Manual and the Control Verification Examination Program to eliminate such barriers, particularly focusing on the communication skills of crewmembers whose duties involve emergency firefighting and lifesaving service. Additionally, the Safety Board believes that the U.S. Coast Guard should seek legislative authority to require a crew composition in each passenger vessel department such that at least 75 percent of the crew responsible for emergency firefighting and lifesaving service be able to understand and communicate in a common language with the officers and to understand and communicate in English with passengers.

CHAPTER 11

ACCIDENT REPORTING AND INVESTIGATIONS

The United States has the authority to investigate accidents involving foreign flag passenger vessels in U.S. navigable waters; for example, the ramming of the docked U.S. Navy Vessel LCM YUF97 by the Panamanian passenger vessel VIKING PRINCESS at Palm Beach, Florida. However, accidents involving foreign flag passenger vessels operating from U.S. ports and embarking U.S. passengers that occur in international waters pose difficulties in both accident reporting and investigation for the U.S. Coast Guard and the Safety Board, the Federal agencies primarily responsible for the safety and welfare of U.S. citizens.

No central data base provides comprehensive safety information or the cause(s) of passenger vessel accidents on a worldwide basis. Thus, it is difficult for the Safety Board or the U.S. Coast Guard to locate information about and to learn invaluable safety lessons from all accidents of passenger vessels that involve fires, collisions, or other serious occurrences unless they are reported by the flag Administrations. Foreign flag passenger vessels operating from U.S. ports with a preponderance of U.S. passengers may not report accidents to U.S. authorities unless disclosed by the media or reported by crewmembers or passengers involved in a given occurrence. A few accidents outside U.S. navigable waters are uncovered by the Coast Guard through monitoring traffic messages even though the accidents do not have to be reported. Additionally, the Coast Guard provides safety coverage in terms of rescue for the foreign flag passenger vessel industry operating out of U.S. ports if an emergency occurs in U.S. navigable waters or in international waters of the Caribbean, particularly in the event of a major medical emergency such as that on the SCANDINAVIAN STAR. U.S. Coast Guard data reflect only a few accidents involving foreign flag passenger vessels. During this safety study, however, it became apparent that fires have occurred on other foreign flag passenger vessels operating from U.S. ports and embarking U.S. passengers. For example, during the study, the Safety Board became aware of fires on the TROPICANA, the SONG OF AMERICA, the AMERIKANIS, and the EMERALD SEAS; these accidents would not be recorded in the U.S. Coast Guard's data base nor would the Coast Guard conduct investigations of these accidents. Thus, meaningful safety improvements or corrective actions would not be proposed or taken.

Interviews with Coast Guard personnel on the reporting of casualty statistics by the international community revealed the following:

- In May 1980, the IMO established a Steering Group on Casualty Statistics with the following terms of reference:

  .1 to receive and evaluate casualty data and statistics on behalf of the Organization with view to

guiding and coordinating these statistical data as required by various bodies;

.2 to recommend areas of investigation based on analysis of casualty statistics;

.3 to provide guidance to the various IMO bodies on the subject of casualty statistics;

.4 to coordinate all casualty statistical matters and to advise the Organization thereon, including consideration of various national casualty schemes; and,

.5 to control any expansion of access to data bases as future needs arise.

- Since the Steering Group was formed, it has provided reports on serious casualties of tankers.

- Some Administrations provide data, but not many Administrations are providing complete data.

The IMO does not prepare an annual, collective report on all passenger vessel accidents. Apparently individual subcommittees may attempt to collect some data. For example, the Subcommittee on Fire Protection periodically has addressed the need for better fire accident records. Thus, in May 1983, the U.S. prepared a paper for that subcommittee on improved reporting of data for fire casualties and the need for more participation by Administrations and defined criteria for reporting.[47] Some Administrations report accidents on a short form prepared by IMO entitled "Fire Casualty Record."

The Safety Board believes that all fires, collisions, and other serious accidents should be reported by the Administrations to the IMO. Such reports should provide data by which to judge the application and effectiveness of the IMO regulations in addressing fire safety, lifesaving, training and drills, watchkeeping, and IMO technical requirements such as radar and

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[47] Agenda item FP 29/6 dated May 20, 1983, for the 29th session of the Subcommittee on Fire Protection, IMO.

electronic technical improvements. For example, data on the collision of the Soviet passenger vessel ADMIRAL NAKHIMOV with the bulk carrier PETER VASEV on August 31, 1986, near Novorossiysk in the Black Sea (423 passengers and crewmembers lost their lives in 7 minutes) (Chernyaev 1988) and investigations into other collisions, such as the CELEBRATION on February 10, 1989, would provide a more meaningful look at watchkeeping and electronic navigation issues.

As a comparison with the accident reporting practices of the marine industry, the International Civil Aviation Organization (ICAO) has developed and implemented a system of reporting aviation accidents to ICAO for use by its member countries to determine safety areas that may contribute to accident prevention or to detail useful or effective investigative techniques (International Civil Aviation Organization 1988). The ICAO also summarizes accident and incident data provided by the member countries and publishes the data bimonthly.[48] The data provide information relevant to accidents and accident prevention for worldwide use. The data may include safety recommendations originating from investigations of aircraft accidents or incidents, preventive action taken or being considered, or other information on accident prevention.

The Safety Board believes that there is a serious void in the collection and dissemination of relevant maritime information about accidents that directly addresses safety issues in the passenger vessel industry.

Therefore, the Safety Board believes that the U.S. Coast Guard should propose that the IMO develop and implement international standards and recommended practices and provide a universal simplified accident reporting form for all serious marine accidents and incidents as defined by IMO (at least collect data on all serious collisions, fires, and groundings), and prepare reports similar to those issued by ICAO that can be used by the IMO and member countries in their deliberations on needed safety improvements or changes in existing IMO safety and technical guidance. It is evident to the Safety Board that fires and collisions occur at sea that are not recorded or tabulated in a meaningful manner by the IMO.

The Safety Board is also concerned that serious accidents involving foreign flag passenger vessels--particularly fires, collisions, or groundings--with U.S. passengers on board that embark from and return to U.S. ports may not be fully investigated and that invaluable safety lessons may be lost. If the circumstances of these accidents were made known, perhaps action could be taken to prevent them from happening in the future. Although the flag Administration in some cases may investigate the accident, the depth of the investigation may not be as detailed as an investigation by the U.S. Coast Guard or the Safety Board. In the aftermath of a serious fire or collision in international waters of a foreign flag passenger vessel carrying many U.S. passengers, the U.S. Coast Guard does not have the

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[48] An example is ICAO's "ADREP Summary," No. 6/88, November-December 1988, with 1988 Annual Index.

authority to investigate the accident. The Safety Board believes the accident of the CELEBRATION, for example, should be investigated by the U.S. Coast Guard to determine if safety improvements are needed in such areas as watchkeeping and the proper use of electronic aids to navigation.

The Safety Board initiated action in the U.S. District Court to enforce Federal subpoenas issued to Carnival Cruise Lines as a result of that accident. The Safety Board sought to depose the crew on the navigating bridge and obtain the records of the CELEBRATION to complete a thorough U.S. investigation of the accident. Carnival Cruise Lines refused to honor the Safety Board's subpoenas. On October 20, 1989, the U.S. District Court, Southern District of Florida, determined that the Safety Board is without jurisdiction to investigate this accident and quashed the subpoenas.

The Safety Board believes that the U.S. Coast Guard should seek legislative authority to require reports of and investigate accidents occurring in international waters involving foreign flag passenger vessels that regularly operate from U.S. ports and embark U.S. passengers as a condition for operating from U.S. ports.

The Safety Board will continue to seek an active investigation role in major acidents, whether in U.S. navigable or international waters, if the vessel is regularly operating from a U.S. port and embarking U.S passengers.

CHAPTER 12

OTHER SAFETY ISSUES

Interpretation and Selective Use of SOLAS

Owners and operators of passenger vessels under various flag Administrations operating in or attempting to enter the U.S. cruise market, particularly the cruise-to-nowhere and Caribbean markets, are not interpreting SOLAS requirements uniformly. In several instances the Coast Guard has had to take a strong position to correct deficiencies on passenger vessels; all these vessels had received SOLAS certificates from the flag Administration attesting that they met the intent of the SOLAS provisions. The Coast Guard's Control Verification Examinations found the following deficiencies:

- Two passenger accommodation decks were not fitted with proper fire resistant bulkheads;
- Automatic fire dampers were inaccessible and manual controls were unmarked;
- Means of escape were confusing, were not enclosed and protected, and did not lead passengers directly to the embarkation deck;
- Use of passenger vessel lifeboats/launches as passenger ferry operations requiring Coast Guard certification as a passenger vessel;
- Lack of proper ventilation draft stops in passenger accommodation decks;
- Condemnation of 35 of 56 liferafts because of defective servicing; that is, the liferafts were placed in nonapproved canisters.

The Coast Guard allowed one vessel, the Greek passenger vessel CROWN ODYSSEY, to operate in U.S. waters from December 1980 until April 10, 1989, with protective measures including additional fire extinguishers, a 24-hour watch in passenger accommodation areas in addition to the 24-hour roving watch, additional directional signs, and assignment of crewmembers at all times to assist passengers to locate their muster stations.

Another example of a vessel not meeting SOLAS requirements is the Bahamian flagged TROPICANA; it originally served as a passenger ferry in English Channel service under a Belgian passenger vessel safety certificate. The vessel then entered the U.S. under a cargo ship safety certificate until it received its Control Verification Examination to begin passenger vessel service from a U.S. port. The Coast Guard concluded that the vessel should meet all SOLAS 74 fire safety requirements because the vessel underwent modifications of a major character to enter the cruise-to-nowhere passenger

market. Overhead bulkheads and deck coverings on the vessel were replaced; the sprinkler system was modified and expanded; ventilation ducting added; stairtowers refinished; cargo hold converted to a swimming pool; and crew accommodations, heating, and cooking appliances added. The Coast Guard's local Officer in Charge of Marine Inspection (Miami) informed the international surveyor (Lloyd's Register of Shipping), Tropicana Cruises, and the Bahamas High Commission (Maritime Division, Ministry of Transport) that this vessel was a conversion of a major character as addressed in Chapter II-2 of SOLAS 74 as amended.[49]

The Coast Guard's Control Verification Examination revealed numerous deficiencies in the vessel's structural fire protection system. Lloyd's Register, representing the flag Administration, did not consider the conversion of four decks to be a "major" modification. The Coast Guard's Marine Inspection Office in Miami did consider the modification to be major and is requiring installation of a smoke detection system and increased fire patrols until the detection system is installed. Additionally, the Coast Guard's examination uncovered many unsealed penetrations of fire boundaries, missing insulation and ventilation draft stops, and missing and improper ventilation dampers.

The Commanding Officer, Marine Inspection Office-Miami, concluded that in this case, the flag Administration and its representative were "fitting the rules to the vessel" instead of "fitting the vessel to the rules." It was clear to the Coast Guard that where it was advantageous to use the later SOLAS regulations, the flag Administration and representative applied that set of rules; for example, on the number of lifeboatmen and fire dampers for ventilation systems. On the other hand, if regulations in SOLAS 60 was less onerous, then they applied that set of rules; for example, in lifesaving equipment and definition of major modification (U.S. Coast Guard 1989).

The requirements and interpretations by representatives of some Administrations may minimize the cost of conversion work but may not meet the proper safety standard for foreign flag passenger vessels attempting to enter the lucrative U.S. cruise market. The Safety Board believes that one solution to these problems with interpretation is to require that all passenger vessels meet one clear set of standards--SOLAS 74 as amended--and that, therefore, the U.S. Coast Guard should seek legislative authority to allow into the U.S. cruise market only foreign flag passenger vessels that meet the requirements of SOLAS 74 as interpreted by the U.S. Coast Guard.

The Commanding Officer, Marine Inspection Office-Miami, required the TROPICANA to add smoke detection systems on the "newly" modified decks as required by SOLAS 74 as amended; as a result of this action, the Coast Guard's enforcement authority of SOLAS was questioned by legal counsel of the

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[49]The regulation defines the following repairs, alterations, and modifications as being of a major character: (1) Any change that substantially alters the dimensions of a ship...; (2) Any change that substantially alters the passenger carrying capacity of a ship; (3) Any change that substantially increases a ship's service life.

owner for this vessel. U.S. law in 46 USC 3303 limits the scope of Control Verification Examination to lifesaving and propulsion equipment requirements. U.S. law in 46 USC 3505, the law that requires application of SOLAS, is applicable to foreign flag vessels over 100 gross tons that have overnight accommodations for 50 or more passengers. The Safety Board believes that the U.S. Coast Guard should seek legislative correction in its authority to make clear that all foreign flag passenger vessels operating from U.S. ports and embarking U.S. passengers are subject to current SOLAS requirements.

Therefore, as a result of this safety study, the Safety Board reiterates Safety Recommendation M-89-43 (classified as "Open--Awaiting Response") resulting from the SCANDINAVIAN STAR accident and issued August 8, 1989, to the U.S. Coast Guard:

> M-89-43
>
> Seek legislative authority to regulate and directly surveil the safety of foreign passenger vessels as a condition for operating from U.S. ports.

Use of U.S. Subchapter T Regulations

The Safety Board is concerned about the use of regulations in 46 CFR Subchapter T, "Small Passenger Vessels," by flag Administrations as a means of (1) exempting their passenger vessels from SOLAS requirements, and (2) using the U.S. system of admeasurement tonnage instead of the International Tonnage Convention. The EUROPA STAR and the EUROPA SUN, operating under Panamanian registry, are "exempted" from SOLAS 74 requirements by Panama, but Panama states the vessels fully comply with "USCG regulations of Subchapter T (CFR 46) (Sections 175-187)." These vessels admeasure about 98 gross tons under the U.S. system but are actually about 700 gross tons under the International Tonnage Convention. Beginning June 23, 1988, the Marine Safety Officer in Mobile, Alabama, Eighth Coast Guard District, requested from the Eighth District Commanding Officer specific guidance for the proper Control Verification Examination for these "new" entries into the foreign flag passenger vessel fleet. These vessels are exempted from SOLAS 74 requirements by the flag Administration and, therefore, these vessels are not covered by existing U.S. or international law, regulation, or policy. Specifically, Panama exempted these vessels from construction requirements on stability; subdivision; means of escape; fire protection, detection, and arrangements; and other SOLAS requirements. The Coast Guard's solution to the problems posed by these vessels, pending some solution from Panama, was to inspect these vessels under the following parameters:

- Foreign flag passenger vessels less than 100 gross tons departing from U.S. ports on voyages to nowhere are considered to be on an international voyage and will require SOLAS certificates.

- Control Verification Examinations will be required for vessels under 100 gross tons.

- Subchapter T will be utilized as the reference standard in conducting the examinations.

- Where a SOLAS exemption presents an unacceptable conflict with Subchapter T requirements, Subchapter T or SOLAS will be imposed.

- The onus will be on the owner to meet either acceptable SOLAS or the equivalent Subchapter T standard. If the owner chooses to meet the equivalent Subchapter T standards rather than SOLAS, the applicable Subchapter T requirement will be annotated on the Control Verification Certificate.

- For vessels of countries not signatory to SOLAS, Subchapter T in its entirety will be applied.

On January 27, 1989, the U.S. Coast Guard provided guidance for control actions for verification of compliance with SOLAS and U.S. regulations for foreign flag passenger vessels that are less than 100 gross tons or have overnight stateroom accommodations for less than 50.[50] (The text of the guidance is in appendix I.)

The Safety Board does not believe that foreign flag passenger vessels should utilize U.S. Subchapter T regulations for small passenger vessels less than 100 gross tons nor should the foreign flag vessels carrying 12 or more passengers be allowed to operate from U.S. ports until they meet all applicable SOLAS requirements. Subchapter T requirements are not as stringent as SOLAS. Vessels such as the Panamanian passenger vessels EUROPA STAR and the EUROPA SUN, or any other vessels intending to operate as foreign flag passenger vessels from U.S. ports, should not be exempted from SOLAS regulations for construction; stability; subdivision; construction fire protection, detection, and suppression; means of escape; lifesaving appliances and arrangements; or other applicable SOLAS requirements.

Further, the gross tonnage on these vessels' certificates issued by Panama should reflect the correct tonnage according to the International Tonnage Convention. The Safety Board believes that all foreign flag passenger vessels should meet IMO's standards developed and issued by the IMO on gross tonnage. The Coast Guard's Control Verification Examinations should review the vessel's safety according to those standards. The U.S. Coast Guard should not approve foreign flag passenger vessels that are exempt from SOLAS standards.

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[50]U.S. Coast Guard No. 16711/31 dated January 27, 1989. Washington, DC. 2 p.

The Safety Board believes that the U.S. Coast Guard should not allow any government to introduce into the U.S. cruise market a foreign flag passenger vessel carrying 12 or more passengers that has not met all SOLAS requirements.

Location of Life Jackets

The report of the fire on the SCANDINAVIAN STAR accident highlighted the Safety Board's concern over conflicting instructions regarding the location of passengers' life jackets during an emergency. In this accident, conflicting instructions were provided to passengers through the emergency placard system and the fire and boat drill conducted on the vessel. The placard system informed passengers that their life jackets should be obtained at their muster location from a crewmember. The fire and boat drill emphasized that life jackets were stored in passengers' cabins under the beds. This implied that passengers had to return to their cabins to obtain their life jackets in an emergency. The conflicting instructions resulted in some passengers, who were near their muster stations on upper decks, attempting to return to their cabins through smoke and poor visibility conditions to obtain their requisite life jackets. An insufficient number of life jackets were found in the storage lockers to accommodate all of the passengers reporting to some muster locations. The Safety Board concluded that "written instructions on the placard in passenger staterooms and verbal instructions given to passengers during the fire and boat drill conflicted as to where passengers were to obtain life jackets during an emergency and, as a result, caused confusion during the evacuation." The Safety Board believes that consistent information should be provided to passengers about the location of life jackets, and that a sufficient number of life jackets should be at muster stations.

The Safety Board has addressed the issue of the location of lifejackets in an earlier accident involving the U.S. passenger vessel PILGRIM BELLE. The Safety Board recommended that the Coast Guard:

> M-86-62
>
> Conduct research to determine the best location for stowing life preservers on all passenger vessels; in the interim, require that life preservers be stowed outside of passenger and crew berthing rooms and closer to or at emergency stations.

On February 19, 1987, the Coast Guard replied as follows:

> The Coast Guard does not concur with this recommendation. The present regulations require life preservers to be distributed in places convenient for passengers and crew. This cannot be determined by "research," but only by careful consideration of the design and arrangement of each vessel. A vessel like the PILGRIM BELLE will often be underway at night and make port calls during the day when passengers may go ashore. This means that in the

> time they spend on board, passengers and crew will frequently be in or near their staterooms. On other vessels where passengers spend their time in the public spaces, those spaces may be the most appropriate locations to stow the lifepreservers. In any case, the emergency stations would not be the appropriate place. In an emergency, persons on board should get their life preservers as soon as possible in case they do not have time to get to the emergency stations.

The Safety Board classified Safety Recommendation M-86-62 as "Closed--Unacceptable Action" on October 10, 1987.

As a result of its investigation of the explosion and fires aboard the U.S. tankship OMI YUKON, the Safety Board found that because life preservers and immersion suits had been stowed in each crewmember's stateroom and most crewmembers aboard were on the main deck, crewmembers were unable to return to their staterooms to retrieve their life preservers and immersion suits (NTSB 1987b). Contrary to the Coast Guard statement that emergency stations are not "the appropriate place" for life preservers and immersion suits, the OMI YUKON accident was one for which the appropriate place to locate life preservers and immersion suits was closer to or at emergency stations. As a result, the Safety Board issued Safety Recommendation M-87-31 for the Coast Guard to require lifepreservers and immersion suits be stowed outside of passenger and crew berthing rooms and closer to or at emergency stations. The Coast Guard rejected the recommendation and on February 2, 1989, the Safety Board classified M-87-31 as "Closed--Unacceptable Action." The Safety Board urges the Coast Guard to reconsider its position and require that life preservers and immersion suits be stowed outside of passenger and crew berthing rooms and closer to or at emergency stations.

The only instructions on the location of life jackets provided to passengers on some foreign flag passenger vessels consist of information printed on a boarding pass or ticket. SeaEscape's SCANDINAVIAN STAR, for example, prints the following instructions on the boarding pass for short cruises:

> In case of an emergency remember, your ship's officers are highly trained experts, follow their instructions carefully and most important: STAY CALM.

Another cruise line, Discovery Cruises, provides the following information on its tickets:

- If you do not have a cabin, proceed directly to your Muster (Assembly) Station as indicated above. Life vests will be issued to you by ship's personnel when you arrive at the station.

- If you do have a cabin, please proceed to that cabin and pick up the life vests which are

> stored in the closet. If you are unable to locate your cabin or cannot find the life vest inside the cabin, proceed directly to your Muster (Assembly) Station, where ship's personnel will issue a life vest to you....

Two locations are presented on this ticket for obtaining a life jacket. The instructions for passengers with cabins direct them to proceed to their cabins to pick up life jackets unless they cannot locate the cabin.

The Safety Board has repeatedly seen heavy smoke conditions (for example, the SCANDINAVIAN STAR and OMI YUKON accidents) in accommodation areas that makes it difficult, if not impossible, for passengers to follow the instructions provided on the ticket.

As a result of the SCANDINAVIAN STAR accident, the Safety Board issued the following recommendation (classified as "Open--Awaiting Response") on August 8, 1989, to SeaEscape:

> M-89-52
>
> For each vessel in your fleet provide life jackets at each muster station for passengers in addition to those life jackets stowed in the cabins.

The SOLAS 74 Regulation 7, "Personal Life-Saving Appliances," states the following:

> Life jackets shall be placed as to be readily accessible and their positions shall be plainly indicated. Where, due to the particular arrangements of the ship, the life jackets provided in compliance with the requirements ...may become inaccessible, alternative provisions shall be made to the satisfaction of the Administration which may include an increase in the number of life jackets to be carried.

The SOLAS requirements do not state that life jackets should be in a sufficient number to handle all passengers at muster station locations. SOLAS does suggest that Administrations may increase the number of life jackets to be carried.

Passengers on any vessel, especially those on cruises in an ocean environment, must be provided with information to effectively react in an emergency. Passengers need to be familiar with the safety features of a large vessel so that they know how to report to specified areas of a vessel if not previously informed at a safety orientation or emergency drill. In an emergency, there may be little time to read placards or fine print on a ticket or boarding pass, assuming that conditions allow instructions to be read, regarding lifesaving devices and emergency stations. The Safety Board believes that written instructions and verbal information provided to passengers at muster locations during fire and boat drills should be uniform

so that in an emergency instructions are not in conflict, and that an adequate number of life jackets for passengers should be located at muster locations. Additionally, the Safety Board believes that the U.S. Coast Guard should propose to the IMO more specific requirements for the placement of life jackets and the number of life jackets carried, specifically focusing on passenger vessels that carry life jackets in cabins but do not have enough life jackets for passengers at muster locations in the event of an emergency.

Mass Casualty Planning

There are no a requirements for a mass casualty emergency plan formulated by any international body such as the IMO, the International Labor Organization, or the World Health Organization that address the capability of foreign flag passenger vessels to handle numerous casualties that result from a collision or fire at sea.

Requirements of a mass casualty emergency plan would include:

- competent personnel on board a vessel for the assessment of passenger and crew casualties in an emergency;
- an active medical consultation and communications system;
- a transportation plan to evacuate casualties; and
- geographically located shore-based reception facilities to receive casualties.

The Safety Board believes that a mass casualty emergency plan should be required.

Application of U.S. Alcohol/Drug Rules to Foreign Flag Passenger Vessels

The Safety Board believes that U.S. alcohol and drug rules should be uniformly applied to foreign flag passenger vessels operating from U.S. ports and embarking U.S. passengers. Domestic marine employers are responsible for applying these rules to foreign citizens who are employed by their U.S. company. The U.S. Coast Guard's rules set out several scenarios (the Coast Guard's discussion is presented in appendix J). The Coast Guard plans to resolve potential conflicts with foreign governments "in a manner that accommodates their concerns while ensuring the necessary level of safety" for such situations.[51] The Safety Board will be particularly interested in the Coast Guard's actions directed to U.S. marine employers operating foreign flag vessels and the need for alcohol/drug testing of officers and

[51] In 53 FR 47064, issued November 21, 1988.

crewmembers involved in serious marine accidents involving foreign flag passengers vessels that regularly operate from U.S. ports and embark U.S. passengers.

The IMO does not have any international standards or accident investigation protocol addressing the need for alcohol/drug testing after serious marine accidents. The Safety Board believes that the IMO could improve safety in the maritime industry by issuing a strongly worded international resolution that crewmembers in safety-sensitive postions should not use alcohol or imparing drugs while on duty or for a specified period of time prior to going on duty.

PART 3

STATE-REGULATED PASSENGER VESSELS

CHAPTER 14

VESSEL STABILITY

Stability characteristics were factors in two accidents of State-regulated passenger vessels investigated by the Safety Board.

On June 17, 1978, the steam showboat S/B WHIPPOORWILL overturned while in transit on Pomona Lake, Kansas. Of the 60 people on board the vessel, 15 were killed and 6 were injured. The vessel sustained only minor damage. The Safety Board determined that the probable cause of the accident was the WHIPPOORWILL's reduced stability as a result of an accumulation of water within the vessel's integral hull tanks, the vessel's inadequate design stability, its operation during adverse weather conditions, and the failure of the operator to obtain the current weather forecasts (NTSB 1979a).

On July 7, 1984, the excursion vessel M/V SCITANIC was proceeding down the Tennessee River, near Huntsville, Alabama, when strong winds generated by severe thunderstorm activity caused the vessel to capsize. Of the 15 passengers and 3 crewmembers aboard, 4 passengers and all the crew escaped from the capsized vessel; 11 passengers were trapped inside the vessel and drowned. Fortunately, 55 people scheduled to make the cruise were not on board. The Safety Board determined that the probable cause of the accident was the wind load from the exceptionally high velocity winds, generated by a microburst from an approaching thunderstorm, which exceeded the stability limitations of the SCITANIC (NTSB 1985b).

In the investigations of these two accidents, the Safety Board determined that these vessels were unstable at even low level wind speeds. As a result of these accidents, the Safety Board made two recommendations to the National Association of State Boating Law Administrators (NASBLA):[52]

> M-79-16
>
> Amend the NASBLA model State Boating Act to require commercial small passenger vessels operating exclusively on State waters to meet the U.S. Coast Guard stability criteria in 46 CFR 171 for small passenger vessels.
>
> M-85-48
>
> Issue national guidelines to States recommending that recreational vessels not subject to Federal jurisdiction, having two or more decks for passengers above the vessel's water line, be required by State law or

[52] The National Association of State Boating Law Administrators is an organization comprising the boating law administrators of the 50 States and the U.S. territories. The association provides safety guidance in educational, enforcement, and technical areas.

regulations to meet U.S. Coast Guard stability criteria in 46 CFR Subchapter S.

On October 21, 1987, the NASBLA passed two resolutions regarding stability applicable for small passenger vessels not under Federal jurisdiction. These resolutions encouraged the States to adopt the stability criteria contained in 46 CFR Subchapter S for vessels that carry 50 or more persons and that have two or more passenger decks above the water line, and to adopt the stability criteria contained in 46 CFR Subchapter T for vessels over 20 feet in length that carry passengers for hire on sole State waters.

Recommendation M-85-48 was classified as "Closed--Acceptable Alternate Action" on February 22, 1988. Recommendation M-79-16, as a result of this study, has also been classified as "Closed--Acceptable Alternate Action."

The Safety Board is aware that the States of New York and Kansas have some stability requirements for small passenger vessels under their jurisdiction. The Safety Board believes that all States should review their present safety programs for small passenger vessels under their jurisdiction, determine if they need to initiate regulations to address stability concerns, and take appropriate action.

CHAPTER 14

SAFETY OVERSIGHT

The Safety Board requested in 1988 that the NASBLA poll its Boating Law Administrators about safety programs developed by States that directly addressed small passenger vessels carrying 49 or more passengers. As a result of that inquiry, four States responded: Michigan, Iowa, Pennsylvania, and New York. Additionally, the Safety Board was aware that the State of Kansas had passed a law amending the Kansas Boating Act to require all commercial vessels carrying six or more passengers and operating in the State of Kansas to meet the U.S. Coast Guard stability criteria in 46 CFR 171 for small passenger vessels. Safety Board staff confirmed by telephone survey that California, Indiana, Minnesota, and South Carolina have State programs for safety inspection and/or licensing of passenger vessels.

The Safety Board reviewed State programs provided by Michigan and New York. The Michigan program, State Act 244, was limited to passenger vessels operating on State navigable waters and that carried not more than six passengers.[53] In conversation with the Michigan Department of Natural Resources, Safety Board staff determined that passenger vessels carrying more than six passengers were not covered by the Act and that Michigan believed most larger passenger vessels operated on U.S. navigable waters within its State and therefore were under Federal safety requirements. New York, on the other hand, in its Navigation Law, addresses all vessels operating for commercial purposes on the navigable waters of the State and that carry passengers.[54]

New York, California, Indiana, Minnesota, and South Carolina require an inspection of passenger vessels operating on their waters. New York, California, Iowa, and Pennsylvania issue licenses for passenger vessel operations. New York State, for example, issues a license on successful completion of an examination for the following categories of personnel that operate passenger vessels:

> Joint Pilot and Engineer. This license is for use on small vessels requiring only one person for safe operation. The applicant must have a general knowledge of small boat handling, engine operation, rules of the road, the New York State Navigation Law, use and maintenance of safety equipment, and be familiar with the waters on which the vessel will operate.

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[53] Act 244, "Charter and Livery Boat Safety Act," was approved by the Michigan State Governor on December 4, 1986.

[54] New York State's Navigation Law as amended. New York has had a Navigation Law since 1909.

> **Master.** A Master's license is required for the operation of any public vessel that exceeds any one of the following criteria: a length of 65 feet, displacement of 50 tons, or 65 passengers. The applicant must exhibit to the satisfaction of the inspector a thorough knowledge of seamanship, ship handling, rules of the road, piloting, plus the accepted practices of supervision of a vessel's crew. The applicant must also, in most cases, have served at least 1 year as an Apprentice Master aboard the vessel.
>
> **Engineer.** This license is required on those larger vessels having engine spaces that require tending by someone other than the vessel's operator. The applicant must exhibit a thorough knowledge of the entire marine plant. This includes but is not limited to propulsion, electrical generation, sanitary system, fire pumps, and related auxiliary gear. The applicant must also exhibit a complete understanding of marine safety and fire fighting techniques.[55]

New York's regulations require inspection and approval of equipment in the following categories: anchor and cable, horn and bell, life preservers, floating equipment, bilge and pump system, fire pump and hose, portable fire extinguishers, hull, navigation lights, installed fire system, engine, engine controls and steering gear, fuel tank and fittings, electrical system, and distress equipment. Additionally, the vessel's owner must provide a required stability test and the maximum safe carrying capacity of the vessel.

The Safety Board believes that the New York Navigation Law and the program developed by New York to address passenger vessel safety is a model for States without such programs. The Safety Board believes that the National Association of State Boating Law Administrators (NASBLA) should take a more active role in addressing the need for passenger vessel safety standards and license requirements for passenger vessels operating exclusively on State (non-Federal) waters and some passenger vessels carrying many passengers not for hire.

Therefore, the Safety Board urges the NASBLA to assemble all the States' equipment, inspection, and licensing programs for passenger vessels operating exclusively on State waters and develop a uniform model program for the States without such safety programs. At least two States, Arkansas and Maine, indicated an interest in such a model program. The Safety Board believes that State-regulated passenger vessels operating exclusively on State waters and some passenger vessels carrying many passengers not for hire should meet or exceed the same level of safety as passengers vessels

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[55] From New York State's "Public Vessel Operator's Manual" issued by the New York State's Office of Parks, Recreation and Historic Preservation, OPS 223 1.5M, April 1986.

operating under the Coast Guard's jurisdiction. The Safety Board was unable to document the total number of small passenger vessels operating exclusively on State waters, including State-operated ferries that carry many passengers.

FINDINGS

1. The Coast Guard requires that masters and mates of domestic small passenger vessels carrying passengers for hire be licensed. The license requirements, however, are insufficient because they do not test the applicants' knowledge of emergency procedures for grounding and steering, subdivsion, damage stability, use of electronic navigation including radar, and firefighting systems equipment and regulations.

2. The Coast Guard does not require operational, navigational, or emergency training for deckhands on small domestic passenger vessels admeasuring less than 100 U.S. gross tons. Qualification standards should be established for deckhands on small passenger vessels.

3. Some owners of domestic small passenger vessels less than 100 U.S. gross tons have developed emergency safety manuals for masters and crew. The Coast Guard does not require emergency safety manuals to guide vessel personnel in their duties and responsibilities, particularly in emergencies. Emergency safety manuals are needed on board small passenger vessels.

4. The National Association of Passenger Vessel Owners has published a manual for operators of domestic small passenger vessels to use as a model to improve their safety programs and emergency training of crewmembers on board small passenger vessels.

5. The present U.S. gross tonnage admeasurement system applied to domestic and foreign flag small passenger vessels does not reflect the true size of the vessel. Gross tonnage is used as a basis for establishing standards for the vessels, but the system is insufficient to determine crew size, and requirements for licensed personnel, construction, lifesaving and firefighting equipment, and structural fire protection for "oversized" small passenger vessels that carry many passengers.

6. Sufficient primary lifesaving equipment is needed on small passenger vessels that keeps all passengers and crewmembers out of the water to reduce the effects of hypothermia and to facilitate location of persons abandoning a vessel.

7. Most domestic passenger vessels do not deposit passenger counts or lists ashore before sailing. Such information left at a specified location should enable emergency response personnel to determine the number of persons on a passenger vessel.

8. Domestic passenger vessels are not required to regularly conduct passenger safety briefings. Lack of a safety orientation briefing shortly after departure could jeopardize the survival of passengers in a rapidly developing emergency.

9. Domestic small passenger vessels are not required to carry certain safety and navigation equipment such as gyrocompass, gyrostabilized radar, fathometer, and electronic position-fixing devices. The requirement for installation and use of this equipment on small passenger vessels would further enhance the safety of passengers and crewmembers.

10. The Coast Guard has issued alcohol and drug rules applicable to the passenger vessel industry; the rules require marine employers to collect appropriate toxicological samples within 24 hours after an accident. That amount of time, however, can diminish the value of the tests. Toxicological samples should be taken within 4 hours after an accident to produce meaningful test results.

11. The Coast Guard's alcohol/drug rules do not yet apply to foreign flag passenger vessels operating for or contracted by marine employers based in the United States; there are no similar international rules addressing alcohol/drug use by crewmembers on foreign flag passenger vessels. There is a need for the Coast Guard to clarify its authority to require alcohol/drug testing of crewmembers on board foreign flag passenger vessels operating regularly from U.S. ports and embarking U.S. passengers.

12. Present U.S. law needs to be clarified to address SOLAS application to foreign flag passenger vessels under 100 gross U.S. tons or vessels over 100 gross tons that do not have overnight accommodations for 50 or more passengers and that operate on international routes. The international definition of a passenger vessel is a vessel with 12 or more passengers on international routes.

13. The safety of passengers on foreign flag passenger vessels would be greatly increased if all such vessels had a centralized automatic fire control system on the navigating bridge that integrates the fire detectors, the automatic fire door controls, the ventilation system controls, and the general alarm into a unified system.

14. The safety of passengers on foreign flag passenger vessels operating from U.S. ports would be greatly increased if these vessels were required to have an automatic ventilation system shutdown in the event of fire.

15. Fires on some foreign flag passenger vessels have spread because of delays in closing fire doors. Fire doors are not normally equipped with automatic door release systems activated by heat or smoke detectors. Such fire door release systems would be effective in stopping the spread of smoke and fire and would therefore greatly increase the safety of passengers on board foreign flag passenger vessels operating out of U.S. ports.

16. Recent on-board emergency firefighting and lifesaving drills on some vessels, required by the Coast Guard under the Control Verification Examination Program have indicated a need for better crew training.

17. Several fires in accommodation spaces on foreign flag passenger vessels probably would not have spread if automatic sprinkler systems had been installed on the vessels. Fire safety would be greatly increased on board foreign flag passenger vessels that operate out of U.S. ports if these vessels were required to have automatic sprinkler systems.

18. Fire doors in main vertical zone bulkheads on many foreign flag passenger vessels do not contain hose ports. Such hose ports would limit the spread of toxic smoke and hot gases if firefighters had to evacuate a main vertical fire zone. Passenger safety would be greatly improved if such vessels were required to have hose ports installed in fire doors in main vertical zone bulkheads.

19. Some foreign flag passenger vessels entering or soon to enter U.S. ports will have large, open areas and atriums that vertically transcend several decks and pose risks to fire safety. Passenger safety would be greatly improved if smoke detection systems, smoke extraction systems, two means of escape, and automatic sprinkler systems were required.

20. Most U.S.-based companies operating foreign flag passenger vessels do not require firefighting training for crewmembers responsible for firefighting. Many senior officers and safety officers on foreign flag passenger vessels have not received current proficiency in firefighting training. Improved fire training is needed for the officers and crews of foreign flag passenger vessels operating from U.S. ports.

21. Safety of Life at Sea (SOLAS) convention requirements address the need for a training manual for lifesaving concerns, although distribution of the manual may be limited only to officers; there is no requirement in SOLAS for a firefighting manual available for crewmembers who have firefighting responsibilities. A requirement is needed for a firefighting manual on board foreign flag passenger vessels operating from U.S. ports.

22. International standards do not require emergency drills for passengers on some foreign flag passenger vessels; reliance is placed on fire safety instructions on boarding passes, placards, and in public address announcements. The safety of passengers on board foreign flag passenger vessels operating out of U.S. ports would be enhanced if passengers were required to participate in emergency drills immediately upon the vessel's departure from port.

23. Proper orientation of passengers through the use of actual emergency drills are instrumental in preventing panic and in the safe, orderly evacuation of passengers.

24. Language barriers among crewmembers and between crewmembers and passengers on board foreign flag passenger vessels operating from U.S. ports endanger passenger lives in an emergency. Language barriers need to be eliminated from foreign flag passenger vessels operating from U.S. ports.

25. The U.S. Coast Guard does not have authority to investigate serious accidents or incidents occurring in international waters on foreign flag passenger vessels operating from U.S. ports and embarking U.S. passengers. Serious accidents and incidents involving these vessels when in international waters are not required to be reported to the U.S. Coast Guard. Substantial investigations by the flag Administrations are not always done and, when done, full documentation is not provided to the International Maritime Organization. Passenger safety would be greatly enhanced if accidents involving foreign flag passenger vessels operating from U.S. ports were required to be reported to the Coast Guard and if formal authority was extended to the Coast Guard to fully investigate and report on the cause(s) of the accidents.

26. The lack of complete data including causes and technical problems resulting from marine accidents and incidents hampers full assessment by the U.S. Coast Guard of the effect of SOLAS requirements and the Coast Guard's Control Verification Examination Program on the safety of foreign flag passenger vessels.

27. The International Maritime Organization (IMO) does not have international standards or recommended practices for investigations of maritime accidents nor does it have a complete data base on serious accidents or incidents of passenger vessels similar to that required by Annex 13 to the Convention on International Civil Aviation. Passenger vessel safety would be greatly enhanced if the cause(s) of serious accidents and incidents were determined and provided by the flag Administration in a timely manner to the IMO so that the IMO could determine action that could prevent their recurrence.

28. The recommended practice for land-based firefighters proposed by the National Fire Protection Association will improve communications and understanding about firefighting between passenger vessel operators, land-based firefighters, port authorities, and the U.S. Coast Guard.

29. There are no mass casualty emergency plans required for passenger vessels. Passenger safety on foreign flag passenger vessels operating from U.S. ports would be greatly enhanced if these vessels were required to have a mass casualty emergency plan.

30. There is a need for stability and safety equipment standards and/or licensing of operators for passenger vessels operating on State (non-Federal) waters and for some passenger vessels carrying many passengers not for hire. Passenger safety would be greatly enhanced if States had safety programs addressing safety requirements for passenger vessels on State (non-Federal) waters.

RECOMMENDATIONS

Reiterated

As a result of this safety study, the National Transportation Safety Board reiterated to the U.S. Coast Guard the following safety recommendations applicable to domestic passenger vessels:

M-83-79

Amend 46 CFR 185.25 to require that a safety orientation briefing, which includes a demonstration of the proper method of donning life preservers, be provided to passengers on board small passenger vessels that operate on other than protected waters. This briefing should include a statement that all passengers will be requested to don life preservers when possibly hazardous conditions may be expected to be encountered.

M-84-25

Require that passenger vessels with more than one passenger deck have installed an adequate loudspeaker system suitable for announcing passenger advisories, instructions, and emergency alerts from the navigation bridge.

M-84-27

Require that all passenger vessels post conspicuously in passenger spaces passenger safety bills or equivalent instructions for emergency, written in language understandable to nonmariners.

M-86-60

Require fire and boat (abandon ship) drills which include passengers reporting to their emergency muster station on all passenger vessels within 24 hours of departure on cruises that are more than one day's duration.

M-86-61

Require that all passenger vessels except ferries on river routes operating on short runs of 30 minutes or less have primary lifesaving equipment that prevents immersion in the water for all passengers and crew.

M-86-64

Require all passenger vessels that have overnight accommodations for 50 or more passengers to meet the

construction, licensing, and manning requirements for a passenger vessel over 100 gross tons.

M-86-72

Require that all passengers receive a comprehensive safety briefing by a crewmember soon after boarding a passenger vessel.

M-86-73

Require comprehensive training of passenger vessel crews in emergency procedures that includes demonstrating proficiency in the use of emergency equipment.

M-86-76

Require that the master or licensed operator of all passenger vessels, except ferries on short routes, deposit an accurate passenger and crew manifest ashore before sailing, and update the manifest during the voyage. Require the master of ferries on short routes to keep an accurate count of all persons aboard.

M-87-113

Amend 46 CFR 185.25-1(d) to require that a licensed crewmember present a verbal passenger safety briefing, which includes all the subjects listed in 46 CFR 185.25-1(d) (1) through (4), to all passengers before getting underway.

M-87-115

Amend 46 CFR Part 187 to establish qualification standards for deckhands on small passenger vessels. [Note: Since this recommendation was issued in 1987, Part 187 was incorporated in 46 CFR Part 10. Amendments resulting from this recommendation would thus be made to 46 CFR Part 10.]

M-88-9

Require that operators of all inspected radar-equipped passenger vessels under 300 gross tons be qualified as radar observers.

M-88-10

Require, in the current regulatory project (CGD 85-080) concerning small passenger-carrying vessels, that safety standards relative to construction, lifesaving equipment, firefighting equipment, and manning and licensing be based on the number of passengers carried rather than the gross tonnage of the vessel.

M-88-44

Establish watch and duty time limitations for crewmembers on board ferries and other inspected passenger vessel.

Also as a result of this safety study, the National Transportation Safety Board reiterated to the U.S. Coast Guard the following safety recommendations applicable to foreign flag passenger vessels:

M-85-59

Propose to the International Maritime Organization an amendment to SOLAS 74 to require that passenger ships on short international voyages conduct drills or safety orientations for passengers at muster stations immediately upon departure from port. Safety orientation briefings should include a demonstration on the donning of life preservers, evacuation or disembarkation routes, information concerning the function of automatic fire doors, and actions to take in the event of a fire or other emergency.

M-89-43

Seek legislative authority to regulate and directly surveil the safety of foreign passenger vessels as a condition for operating from U.S. ports.

M-89-44

Seek legislative authority to require that all passenger vessels operating from U.S. ports and embarking U.S. passengers integrate smoke detectors into local ventilation systems to shut down the ventilation systems automatically when the detector is activated to prevent the spread of smoke.

Resulting From This Study

As a result of this safety study, the National Transportation Safety Board also made the following recommendations:

--to the United States Coast Guard:

Establish and administer examinations to test compentency of masters operating domestic small passenger vessels carrying six passengers for hire. Areas to be tested are: damage stability, firefighting systems equipment and regulations, emergency steering, emergency procedures prior to and after grounding, and electronic navigation including radar. (Class II, Priority Action) (M-89-111)

Develop and implement regulations to require that domestic small passenger vessels carrying more than six passengers have appropriate operating and emergency manuals for crewmembers explaining the owner's and operator's policies and procedures. (Class II, Priority Action) (M-89-112)

Require owners and/or operators of all domestic small passenger vessels to keep records that include information on training provided to crewmembers and emergency drills in use of safety equipment, firefighting and man-overboard rescue, and other safety-related information. (Class II, Priority Action) (M-89-113)

Amend 46 CFR Part 16 to require marine employers to monitor relevant behavior and performance such as work attendance, work habits, and motor vehicle driving records of all marine employees in safety-sensitive positions and to recommend counseling to those employees whose work attendance, work habits, or motor vehicle driving records are consistent with possible alcohol and/or drug abuse. (Class II, Priority Action) (M-89-114)

Amend 46 CFR Part 16 to require annual drug and alcohol detection training for all employees who are required to monitor fitness for duty of other marine employees in safety-sensitive positions. (Class II, Priority Action) (M-89-115)

Require all domestic passenger vessels that carry 50 or more passengers and that operate on all routes other than rivers be equipped with an operating gyrocompass. (Class II, Priority Action) (M-89-116)

Require all domestic passenger vessels that carry 50 or more passengers and that operate on all routes other than rivers be equipped with an operating gyrostabilized radar. (Class II, Priority Action) (M-89-117)

Require all domestic passenger vessels that operate on all routes other than rivers be equipped with an operating fathometer. (Class II, Priority Action) (M-89-118)

Require all domestic passenger vessels that operate on all routes other than rivers be equipped with an operating electronic position-fixing device such as loran or a satellite receiver. (Class II, Priority Action) (M-89-119)

Require a fixed firefighting system in the engineroom (without regard to the type of fuel used for propulsion for domestic small passenger vessels. (Class II, Priority Action) (M-89-120)

Include in the final rule on "Small Passenger Vessel Inspection and Certification" a phase-in period of 3 years for the full implementation of float-free 406.025 MHz satellite emergency position indicating radio beacons (EPIRBs) for small passenger vessels operating on ocean or coastwise routes. (Class II, Priority Action) (M-89-121)

Seek legislative authority to require all foreign flag passenger vessels, regardless of gross tonnage, to meet SOLAS 74 requirements as a condition for operating from U.S. ports and embarking U.S. passengers. (Class II, Priority Action) (M-89-122)

Examine and verify that all foreign flag passenger vessels, regardless of gross tonnage, operating from U.S. ports and embarking U.S. passengers meet all SOLAS requirements. (Class II, Priority Action) (M-89-123)

Seek legislative authority to require that passenger vessels, as a condition for operating from U.S. ports and embarking U.S. passengers, have safety fire protection improvements including but not limited to:

- A centralized automatic/ manual fire control system on the navigating bridge that integrates the fire detector, automatic fire door controls, the ventilation system controls, and general alarm into a unified system. (Class II, Priority Action) (M-89-124)

- Integrated heat and/or smoke detectors with automatic fire door release switches so that the doors will close automatically when the detectors are activated. (Class II, Priority Action) (M-89-125)

- A sprinkler system installed in accommodation areas regardless of the method of fireproof construction used. (Class II, Priority Action) (M-89-126)

- Hose ports in all fire doors so that these doors may be fully closed when fire hoses have to be led through the doors. (Class II, Priority Action) (M-89-127)

- Lined linen fire hoses or equivalent that replace unlined linen fire hoses. (Class II, Priority Action) (M-89-128)

- A crew composition in each passenger vessel department such that at least 75 percent of the crew responsible for emergency, firefighting, and lifesaving service be able to understand and communicate in a common language with the officers and to understand and communicate in English with passengers. (Class II, Priority Action) (M-89-129)

Propose to the International Maritime Organization that low power, small emergency lights be required to be installed at floor level in accommodation areas and passageways that direct passengers to emergency exits on all passenger vessels regularly operating from U.S. ports and embarking U.S. passengers. (Class II, Priority Action) (M-89-130)

Propose to the International Maritime Organization that periodic training in marine firefighting techniques be required for deck and engineering officers on all passenger vessels. (Class II, Priority Action) (M-89-131)

Propose to the International Maritime Organization that crewmembers with firefighting responsibilities on board passenger vessels be certificated by the flag Administration to have completed a practical firefighting training course. (Class II, Priority Action) (M-89-132)

Propose to the International Maritime Organization that passenger vessels carrying more than 500 passengers and crew on international routes establish a full-time professional firefighter position. (Class II, Priority Action) (M-89-133)

Amend regulations in 46 CFR Subchapter H, "Passenger Vessels," to require hose ports for U.S. passenger vessels in all fire

doors so that these doors may be fully closed when fire hoses have to be led through fire doors. (Class II, Priority Action) (M-89-134)

Propose to the International Maritime Organization to require that all operators of passenger vessels subject to SOLAS requirements develop and distribute to crewmembers with firefighting responsibilities a training manual that contains instructions and information on firefighting and detailed actions required by crewmembers in the event fire occurs. (Class II, Priority Action) (M-89-135)

Develop a program to assess and monitor communication skills of crewmembers on foreign flag passenger vessels whose duties involve emergency, firefighting, and lifesaving service and who by the nature of the service must interact with U.S. passengers so that language barriers are eliminated. (Class II, Priority Action) (M-89-136)

Propose to the International Maritime Organization to develop and implement international standards and recommended practices for maritime accident investigation. (Class II, Priority Action) (M-89-137)

Propose to the International Maritime Organization to provide a universal simplified accident reporting system, and prepare periodic reports similar to those issued by the International Civil Aviation Organization. (Class II, Priority Action) (M-89-138)

Seek legislative authority to require any passenger vessel regularly operating from U.S. ports and embarking U.S. passengers to report to the U.S. Coast Guard any accident in international waters, including but not limited to such accidents as groundings; collisions; loss of main propulsion or steering; or loss resulting in a reduction of maneuvering capabilities; or an occurrence materially and adversely affecting the vessel's seaworthiness or fitness for service or route, including fire, flooding, or failure or damage to fixed fire-extinguishing systems, lifesaving equipment, or auxiliary power generating equipment. (Class II, Priority Action) (M-89-139)

Seek legislative authority to investigate accidents in international waters involving any passenger vessel regularly operating from U.S. ports and embarking U.S. passengers, including but not limited to such accidents as groundings; collisions; loss of main propulsion or

steering; or loss resulting in a reduction of maneuvering capabilities; or an occurrence materially and adversely affecting the vessel's seaworthiness or fitness for service or route, including fire, flooding, or failure or damage to fixed fire-extinguishing systems, lifesaving equipment, or auxiliary power generating equipment. (Class II, Priority Action) (M-89-140)

Disseminate the National Fire Protection Association's "Recommended Practice for Land-based Fire Fighters Who Fight Marine Vessel Fires" to captains of the ports, port authorities, marine employers, land-based firefighters, and others so that an increased level of preparedness and contingency planning is accomplished at port locations where passenger vessels berth. (Class II, Priority Action) (M-89-141)

Propose to the International Maritime Organization, International Labor Organization, and the World Health Organization to require a mass casualty emergency plan that addresses the capabilities of passenger vessels to adequately provide health protection and medical care to passengers in a serious emergency. (Class II, Priority Action) (M-89-142)

Propose to the International Maritime Organization an amendment to SOLAS to require life jackets at muster stations for all passengers in addition to those life jackets stowed in cabins. (Class II, Priority Action) (M-89-143)

Propose to the International Maritime Organization that it develop and adopt a resolution against the use of alcohol and/or impairing drugs for any personnel in safety-sensitive positions while engaged in commercial passenger vessel operation. (Class II, Priority Action) (M-89-144)

Propose to the International Maritime Organization that it develop and adopt a standard protocol for chemical testing for alcohol and/or impairing drugs of responsible vessel personnel after marine accidents. (Class II, Priority Action) (M-89-145)

--to the National Association of Passengers Vessel Owners:

In conjunction with the U.S. Coast Guard, develop emergency manuals for crewmembers explaining the owner's and operator's policies and procedures and to ensure that crewmembers have basic safety training in those areas critical to their own and their passengers' safety and survival. These areas include firefighting and man-

overboard drills, use of critical lifesaving equipment, rules of the road, navigation principles, and emergency communication requirements. (Class II, Priority Action) (M-89-146)

-- to the Cruise Lines International Association:

Urge operators and owners of passenger vessels operating from U.S. ports and embarking U.S. passengers to periodically train all senior and safety officers of such vessels at an approved, practical, marine firefighting school. (Class II, Priority Action) (M-89-147)

Urge operators and owners of passenger vessels operating from U.S. ports and embarking U.S. passengers to train all crewmembers with firefighting responsibilities at an approved, practical, marine firefighting school. (Class II, Priority Action) (M-89-148)

-- to the National Association of State Boating Law Administrators:

Develop and approve a uniform model passenger vessel safety program for passenger vessels operating exclusively on State waters and passenger vessels carrying passengers not for hire. (Class II, Priority Action) (M-89-149)

-- to cruise vessel owners and operators:

For each vessel in your fleet, provide life jackets at muster stations for all passengers in addition to those life jackets stowed in the cabins. (Class II, Priority Action) (M-89-150)

--to Washington State Ferries:

Establish work shifts and watches for masters, mates, and crewmembers that minimize mental and physical fatigue. (Class II, Priority Action) (M-89-151)

--to the Governor/legislative leaders of the State of Washington:

Provide requisite safety oversight to ensure that work shifts and watches for masters, mates, and crewmembers operating Washington State Ferries minimize mental and physical fatigue. (Class II, Priority Action) (M-89-152)

Closed

As a result of this study, the National Transportation Safety Board classified the following recommendations as "Closed."

--to the National Association of State Boating Law Administrators:

M-79-16

Amend the NASBLA model State Boating Act to require commercial small passenger vessels operating exclusively on State waters to meet the U.S. Coast Guard stability criteria in 46 CFR 171 for small passenger vessels.

Status: "Closed--Acceptable Alternate Action."

--to Washington State Ferries:

M-82-31

Establish a program to inform ferry passengers of the action they should take in various types of emergencies, and make the information readily available by suitable means at ferry terminals and on board ferries.

Status: "Closed--Acceptable Alternate Action."

--to the U.S. Coast Guard:

M-85-33

Amend U.S. regulations and seek international agreement to require passenger ships to be provided with hose ports in all fire doors so that they may be fully closed when fire hoses have to be led through fire doors.

Status: "Closed--Unacceptable Action/Superseded" by Safety Recommendations M-89-127 and M-89-134.

M-85-34

Expedite U.S. rulemaking and seek international agreement to require all passenger vessels to have sprinkler system installed to accommodation areas regardless of the type of fireproof construction used.

Status: "Closed--Superseded" by Safety Recommendation M-89-126.

M-85-60

Propose to the International Maritime Organization an amendment to SOLAS 74 to require that heat or smoke detectors be made a part of each automatic fire door release switch on passenger ships so that the door will close when the detector is activated.

Status: "Closed--Superseded" by Safety Recommendation M-89-125.

M-85-61

Propose to the International Maritime Organization an amendment to SOLAS 74 to require that all passenger ships carrying more than 36 persons on international routes have an automatic/manual fire control system in the pilothouse that integrates the fire detectors, the automatic fire door controls, the ventilation system controls, and the general alarm into a unified system.

Status: "Closed--Superseded" by Safety Recommendation M-89-124.

M-86-59

Require a fixed firefighting system in the engineroom (without regard to the type of fuel used for propulsion) of all passenger vessels with accommodations for 50 or more overnight passengers.

Status: "Closed--Superseded" by Safety Recommendation M-89-120.

M-86-65

Require the masters of all passenger vessels that have overnight accommodations for 50 or more passengers to pass an examination on applicable sections of 46 CFR Subchapter H regulations, including subdivision, damage stability, structural fire protection, and electronic navigation.

Status: "Closed--Superseded" by Safety Recommendation M-89-111.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ JAMES L. KOLSTAD
Acting Chairman

/s/ JIM BURNETT
Member

/s/ JOHN K. LAUBER
Member

/s/ LEMOINE DICKINSON, JR.
Member

JOSEPH T. NALL, Member, did not concur with the majority in adopting the report and recommendations (as revised by discussion during the Board meeting) without further Board review of changes to the report. He favored directing the staff to focus the report and recommendations more narrowly and to recirculate the report for approval. He supported the general intent of the recommendations as approved.

October 11, 1989

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APPENDIX A

ORGANIZATIONS AND INDIVIDUALS CONTACTED AND/OR WHO PROVIDED WRITTEN INFORMATION FOR THE STUDY

Associations

Florida Caribbean Cruise Association
Massachusetts Passenger Vessel Owners/Operators Association
National Association of Passenger Vessel Owners

Domestic Passenger Vessels, Owners, and Operators

Bay State Cruises
BB Riverboats
Belle Carol Riverboat Company
Boston Harbor Commuter Services
GENERAL JACKSON
Harbor Cruises
Lake George Steamboat Company
Majestic Charters, Inc.
Opryland USA
SPIRIT OF WASHINGTON
Steamship Authority
Washington State Ferries

Foreign Passenger Vessels, Owners, and Operators

Carnival Cruise Lines
DISCOVERY I
Kloster Cruise Limited
MARDI GRAS
Royal Caribbean Cruise Lines
ROYAL VIKING SUN
TROPICANA

Governmental Organizations

Executive Office of Transportation/Construction, State of Massachusetts
Department of Natural Resources, State of Michigan
Massachusetts Bay Transportation Authority
Massachusetts Water Resources Authority
New York Office of Parks, Recreation and Historic Preservation

U.S. Coast Guard, Headquarters
U.S. Coast Guard, Boston, District 1
U.S. Coast Guard, Miami, District 7
U.S. Coast Guard, New Orleans, District 8
U.S. Coast Guard, Seattle, District 13

International Organizations

British Embassy
Det Norske Veritas
International Maritime Organization
International Chamber of Shipping
International Marine Transit Association
North American Committee, International Committee of Passenger Lines
Royal Norwegian Embassy

Lifesaving Equipment Organizations

Switlik Parachute Company
Viking
Zodiac of North America

Other Organizations

Blount Marine Corporation
Harbor Consultancy International
Latham and Associates
Marine Index Bureau
Navatek Ships
National Marine Health Systems
Richard Hiscock, Consultant
SWATH Ocean Systems
Tillinghast
Wartsilla Marine

APPENDIX B

PASSENGER VESSEL ACCIDENTS INVESTIGATED BY THE NATIONAL TRANSPORTATION SAFETY BOARD, 1974-88

NTSB Report No.	Vessels Involved	Type of Accident	Fatalities	Injuries
MAR-78/09	M/V STOLT VIKING and U.S. crewboat CANDY BAR	Collision	2	--
MAR-79/02	S/B WHIPPOORWILL	Capsize	15	6
MAR-79/04	Ferry M/V GEORGE PRINCE and SS FROSTA	Collision	76	18
DCA79AM058	Passenger vessel M/V BOEHME (Germany)	Fire	--	--
MAR-80/10	M/V POLA DE LENA with ferries M/V CITY OF GRETNA and M/V ALVIN T. STUMPF	Collision	--	--
MAR-80/16	Passenger vessel ANGELINA LAURO (Italy)	Fire	--	2
MAR-81/05	Sternwheel passenger vessel NATCHEZ and U.S. tankship EXXON BALTIMORE	Collision	--	97
MAR-82/01	Ferry M/V KLAHOWYA and M/V SANKO GRAIN	Collision	--	--
MAR-82/04	Ferry AMERICAN LEGION and M/V HOEGH ORCHID	Collision	--	71
MAR-84/05	Passenger vessel M/V YANKEE and M/V HARBEL TAPPER	Collision	--	2
MAR-85/03	Passenger vessel SCANDINAVIAN SEA (Bahamas)	Fire	--	--

NTSB Report No.	Vessels Involved	Type of Accident	Fatalities	Injuries
MAR-85/05	Uninspected passenger vessel SCITANIC	Capsize	11	7
MAR-85/08	Passenger vessel SCANDINAVIAN SUN (Bahamas)	Fire	2	62
MAR-85/09	Passenger vessel M/V FANTASY ISLAND	Fire	--	--
MAR-86/01	U.S. crewboat HELEN MARTIN	Capsize	--	1
MAR-86/02	Ferry M/V A. REGINA (Panama)	Grounding	1	--
MAR-86/04	Charter passenger vessel GULF QUEEN and U.S. crewboat M/V ALAN MCCALL	Collision	1	--
MAR-86/08	Passenger vessel M/V PILGRIM BELLE	Grounding	--	--
MAR-86/09	Passenger vessel MISSISSIPPI QUEEN and towboat CRIMSON GLORY	Collision	--	--
DCA86MM040	Passenger vessel M/S NORTH STAR (Bahamas)	Grounding	--	--
DCA86MM048	Ferry CATHLAMET	Ramming	--	--
MAR-87/04	Passenger vessel EMERALD SEAS (Panama)	Fire	--	17
MAR-88/02	Ferries M/V NORTH STAR and CAPE HENLOPEN	Collision	--	--

NTSB Report No.	Vessels Involved	Type of Accident	Fatalities	Injuries
MAR-89/04	Passenger vessel M/V SCANDINAVIAN STAR (Bahamas)	Fire	--	4
DCA88MM052	Small passenger vessel EDGEWATER #5	Capsize	--	29
DCA88MM052	Small passenger vessels NEVADA and RIVERSIDE	Collision	--	4
DCA88MM055	Passenger vessel ISLANDER	Grounding	--	--
Other Passenger Vessels				
MAR-75/04	Charter passenger vessel COMET	Flooding	16	22
MAR-77/01	Charter passenger vessel PEARL-C	Capsize	8	1
MAR-79/01	Charter passenger vessel DIXIE LEE II	Capsize	13	13
MAR-83/09	Charter passenger vessel SAN MATEO	Capsize	--	4
MAR-84/02	Charter passenger vessel JOAN LA RIE III	Near capsize	8	3
MAR-86/11	Charter passenger vessel MERRY JANE	Capsize	9	6

NTSB Report No.	Vessels Involved	Type of Accident	Fatalities	Injuries
MAR-87/11	Charter passenger vessel FISH-N-FOOL	Capsize	10	1
DCA88MM061	Charter passenger vessel COUGAR	Capsize	4	5
	Accidents Being Investigated in 1989			
DCA89MM029	Passenger vessel M/V CELEBRATION and M/V CAPITAN SAN LUIS (Cuba)	Collision	3	16
DCA89MM031	Passenger vessel M/V VIKING PRINCESS (Panama) and U.S. Navy vessel LCU YFU-97	Ramming	--	--

APPENDIX C

COMMENTS OF THE NATIONAL TRANSPORTATION SAFETY BOARD ON SMALL PASSENGER VESSELS INSPECTION CERTIFICATION

National Transportation Safety Board

Washington, D.C. 20594

Office of the Chairman

August 4, 1989

Commandant (G-LRA-2/3600)(CGD 85-080)
U.S. Coast Guard
2100 Second Street, S.W.
Washington, D.C. 20593-0001

Dear Admiral Yost:

The National Transportation Safety Board has reviewed the notice of proposed rulemaking (NPRM), Small Passenger Vessel Inspection and Certification (CGD 85-080), and believes that the proposed regulations contained therein, taken as a whole, will increase the safety of small passenger vessel operations significantly. Although many of the Safety Board's concerns regarding passenger safety on these vessels have been addressed by the NPRM, there are other concerns which have not been adequately addressed. The Safety Board offers the following comments:

1. On page 4418 of the NPRM, under the heading, "Breakpoints," the notice states:

> The hazards and risks created by the operation of a small passenger vessel varies greatly depending on length, total passenger capacity, existence of overnight accommodations, number of decks, service, route, machinery, etc. Consequently, the Coast Guard has developed a graduated system of regulations with increasingly more stringent requirements for a vessel or operation which presents increasingly greater safety hazards or risks.

The Safety Board is pleased that the Coast Guard has adopted this approach for construction and operation standards, and urges the Coast Guard to use the same approach when the manning and personnel qualification standards for small passenger vessels are issued.

2. In Safety Recommendation M-85-045 the Safety Board urged the Coast Guard to review and reevaluate the basis for the stability criteria contained in 46 CFR 170.170 which are a maximum wind speed of about 37 knots for protected waters and about 43 knots for partially protected waters for small vessels, since these values frequently are exceeded during thunderstorm activity. On December 31, 1986 the Coast Guard responded:

> A more viable alternative to an arbitrary increase in the "P" factor used in the weather criterion would be to examine the hull geometry of small vessels such as the SCITANIC to determine

hull/superstructure size relationships for general safety. The Coast Guard has recently begun project to update Subchapter T. As part of this project, the Coast Guard will consider the need for supplementary stability criteria for Subchapter T vessels.

Based upon this response, the Safety Board classified Recommendation M-85-45 as "Open--Acceptable Alternate Action" "pending the completion of the Coast Guard regulation project." The NPRM does not include any supplementary stability criteria to account for the "hull/superstructure size relationships" mentioned in the Coast Guard response of December 31, 1986, nor does it address the fact that wind speeds assumed in the criteria are frequently exceeded during thunderstorm activity. Therefore, the Safety Board urges the Coast Guard to revise the stability criteria in 46 CFR 170.170 to account for unusual hull geometries and high winds associated with thunderstorm activity.

3. As a result of its investigation of the grounding of the small passenger vessel PILGRIM BELLE on July 28, 1985 in Vinyard Sound, Massachusetts, the Safety Board issued the following recommendations:

M-86-56

Either clearly define lakes, bays, and sounds at 46 CFR Subchapter H and Subchapter T to provide for uniform application of the Passenger vessel regulations or eliminate this route designation.

M-86-57

Harmonize the intact stability requirements (ocean, partially protected waters, and protected waters) found at 46 CFR Subchapter S with the specified routes (ocean, coastwise, lakes, bays, and sounds, Great Lakes, and rivers) found at 46 CF Subchapter H and Subchapter T to clearly define which stability criteria apply to which route.

On February 19, 1987, the Coast Guard issued the following reply to M-86-56:

The Coast Guard does not concur. Eliminating this route would place an undue burden on vessels operating on what are generally considered inland waters. Subjecting vessels on such routes to the lifesaving equipment, crew level, mooring equipment, and radio and EPIRB requirements for ocean or coastwise vessels is not considered necessary nor desirable. This is because this route includes those waters which are usually not far from land, have high traffic densities, often cover a relatively small area, are not subjected to the rigors of the open sea, and offer the best opportunity for a prompt recovery of persons in the water.....

On October 10, 1987, the Safety Board responded:

> The Safety Board does not agree that "Eliminating this route would place an undue burden on vessels operating in what are generally considered inland waters." The primary design or equipment difference between lakes, bays, and sounds service and coastwise service is the amount and type of lifesaving equipment required aboard the vessel. The Coast Guard states that the lakes, bays, and sounds route "includes those waters which are usually not far from land, have high traffic densities, often cover a relatively small area, are not subjected to the rigors of the open sea, and offer the best opportunity for a prompt recovery of persons in the water." However, Rhode Island Sound, where this accident occurred, shows the inconsistency of the Coast Guard's policy and the need for a clear definition. After more than 20 years, without any apparent change in water temperature, traffic densities, rescue capabilities, or the open ocean characteristics of Rhode Island Sound, the local OCMI changed Rhode Island Sound from lakes, bays, and sounds service to coastwise service for small passenger vessels but not for passenger ferries. Contrary to the Coast Guard's statement that eliminating this route would place an undue burden on vessels, eliminating this route would provide uniform protection for passengers throughout the United States, and enable vessel owners to determine the amount of required lifesaving equipment without having to obtain individual interpretations of lakes, bays, and sounds service from the OCMI in each OCMI zone through which the vessel will operate throughout its history. Because of the confusion between coastwise, and lakes, bays, and sounds service, the PILGRIM BELLE did not have the lifesaving equipment required by the Coast Guard regulation for coastwise service at the time of the accident although it was operating in coastwise service.

On February 19, 1987, the Coast Guard replied to M-86-57 as follows:

> The Coast Guard does not concur. The wording of Subchapter S (exposed waters, partially protected waters, and protected waters) is intentionally distinct from the route designations used throughout the rest of 46 CFR, but is not in disharmony with those routes. Subchapter S uses these terms because they clearly categorize the local conditions for stability purposes. This gives the local OCMI the latitude to enforce appropriate stability criteria based on his knowledge of the local area no matter which route may otherwise apply. The routes specified in Subchapter T and H (oceans, coastwise, lakes, bays and sounds, Great Lakes, and rivers) are general groupings for addressing other issues not directly related to the stability of a vessel, such as requirements for manning, firefighting equipment, vessel control systems, vessel construction, and vessel operations. These routes describe in very general terms the range of a vessel's operations.

> As an example, Chesapeake Bay would come under the lakes, bays, and sounds route classification, but is considered both protected and partially protected depending upon where in the bay a vessel actually operates. As a consequence, a vessel may be built for exposed waters, but be restricted to a lakes, bays, sounds route because of the amount of lifesaving equipment carried or the lack of an EPIRB. The terminology of Subchapter S accounts specifically for the environmental hazards likely to be encountered while operating in a particular body of water. Accordingly, the Coast Guard does not intend to modify, harmonize, or delete any of the route or extent of exposure designations presently in use.

On October 10, 1987, the Safety Board responded:

> The Safety Board does not agree with the Coast Guard that the wording in Subchapter S (exposed waters, partially protected waters, and protected waters) "is not in disharmony" with the route designations in Subchapters T and H (rivers, lakes, bays, and sounds, coastwise, and ocean). Protected waters for stability purposes are "waters presenting no special hazards such as most rivers, harbors, lakes, etc." yet there is a distinction in lifesaving equipment requirements between rivers and lakes. Partially protected waters for stability are "Waters within 20 nautical miles (37 kilometers) of the mouth of a harbor of safe refuge..." yet there is a distinction in lifesaving equipment requirements between lakes, bays, and sounds service (undefined) and coastwise service (20 miles offshore). The example presented by the Coast Guard points out the disharmony in the regulations. The Safety Board does not understand how the Chesapeake Bay can be considered a lakes, bays, and sounds route, protected waters, and partially protected waters all at the same time.

Section 175.400 still defines "oceans," "coastwise," "lakes, bays, and sounds," "Great Lakes," and "river" routes and the terms "partially protected waters," and "protected waters" in the same manner as existing regulations. The Safety Board believes that these definitions are inadequate and confusing. The "lakes, bays, and sounds" route needs either to be clearly defined or eliminated. Also, the routes for intact stability criteria need to be harmonized with specified routes found on U.S. Coast Guard certificates of inspection.

4. Proposed section 175.530 would alternatively allow the owners of certain conventional displacement hull vessels to choose to comply with all the specific regulations for dynamically supported craft (DSC). This alternative extends to the reduced structural fire protection requirements of a DSC and could represent a significant increased risk for passengers aboard conventional displacement hulls. The Safety Board believes such reductions in safety standards are unjustified and opposes this proposal.

5. Section 176.114 allows the local Officer-in-Charge Marine Inspection to permit an inspected small passenger vessel to operate in accordance with the laws and regulations applicable to an uninspected vessel when the vessel is carrying six or less passengers as long as the vessel is maintained and outfitted in compliance with the terms and conditions of its Certificate of Inspection, except for the minimum manning and route restrictions. The Safety Board agrees that the terms and conditions of the Certificate of Inspection, other than manning and route restrictions, should be maintained regardless of the number of passengers on board, and supports the adoption of this regulation.

6. The Safety Board believes that Section 177.500 (h), which specifies the minimum width of doors used as a means of escape, will improve passenger safety on small passenger vessels and supports the adoption of this standard.

7. Section 179.360 addresses coaming heights. In the Discussion of Proposed Regulations section of the NPRM the Coast Guard states:

> The Coast Guard has received general comments on the tripping hazard posed by the coaming required by 171.124 of Subchapter S and which is included in the proposed 179.360. The coamings are required to prevent water on a deck from flowing into the superstructure or hull of a vessel, where the water would cause a reduction in stability. Even vessels operating on protected waters can have water on deck from the wake of other vessels.
>
> The Coast Guard is considering revising the coaming requirement. Specific comments are requested on the coaming requirement and information on accidents caused by coamings.

The Safety Board is opposed to any reduction in minimum coaming heights. The Board believes that a tripping hazard is incidental compared to the hazard presented by water on deck flooding into internal compartments.

8. Section 180.15(f) allows for a 6-year phase-in period before the new 406 MHz satellite EPIRB will be required on small passenger vessels in ocean and coastwise service. The Safety Board believes that 6 years is too long a phase-in period and favors a shorter period, such as 3 years.

9. The Safety Board is pleased to note that section 180.64 eliminates the exemption from the requirement to carry an EPIRB on board small passenger vessels operating within 20 miles of a harbor of safe refuge. The sinking of the small passenger vessel JOAN LA RIE III in 1982, which occurred only 8.5 miles offshore from Manasquan Inlet, New Jersey and which resulted in the deaths of six passengers clearly illustrates the need for the elimination of this exemption.

10. The Safety Board fully supports the provisions of section 180.71 which requires a child size life preserver to be carried for each passenger who is smaller than the lower size limit for the adult size life preserver.

This section is responsive to Safety Recommendation M-83-081, issued to the Coast Guard as a result of the capsizing of the small passenger vessel SAN MATEO in Morro Bay, California on February 16, 1983; the capsizing resulted in 23 school children being thrown into the sea.

11. Section 180.130 proposes that each survival craft be stowed in an automatic float-free launching arrangement so that the survival craft would float off its stowage location in the event of the vessel's capsizing or sinking. The Safety Board believes this proposal to be a significant improvement over existing regulations which do not currently require a float-free stowage arrangements for life floats and buoyant apparatus on small passenger vessels. The Safety Board supports the adoption of this proposed regulation.

12. The Safety Board fully supports the requirement for out-of-the-water flotation equipment on small passenger vessels, as set forth in sections 180.200 through 180.210. However, the Board opposes the proposed substitution of inflatable buoyant apparatus by life floats and buoyant apparatus. The latter require passengers to enter the water when abandoning ship. The Board believes that these provisions needlessly complicate the regulations and establish two levels of safety. The Safety Board believes that all passengers should be provided with out-of-the-water flotation equipment and that this type of equipment provides more than hypothermic protection to survivors. In addition to providing hypothermic protection, out-of-the-water flotation equipment:

1. provides protection from marine predators;

2. provides support for unconscious or injured survivors;

3. does not require survivors to exert themselves to maintain themselves above water;

4. provides a platform which permits the use of survival equipment such as signalling and electronic homing devices; and

5. provides protection from the inadvertent ingestion of sea water.

Additionally, the Safety Board disagrees with the provisions of section 180.206 and 180.208 that allow small passenger vessels operating on lakes, bays and sounds routes and on river routes to carry buoyant apparatus of an aggregate capacity that will accommodate less than 100 % of the passengers on board during certain times. The Safety Board urges that out-of-the-water survival equipment should be required to accommodate all passengers and crew on all passenger vessels except for ferries on river routes operating on short runs of 30 minutes or less.

13. Section 181.400 of the NPRM, which sets forth the proposed requirements for fire extinguishing systems on small passenger vessels, proposes that a fire extinguishing system be required in all spaces

containing propulsion machinery. The proposed rule would be responsive to Safety Board Recommendation M-86-059. Safety Board recommendation M-86-059 recommended that a fixed firefighting system be required in the engineroom (without regard to the type of fuel used for propulsion) of all passenger vessels with accommodations for 50 or more overnight passengers, and the Board urges the adoption of this regulation.

14. The preamble to the NPRM states that proposed section 182.425 differentiates between requirements pertaining to wet and dry exhaust systems because dry exhaust systems have higher operating temperature and should therefore meet higher standards than wet exhaust systems. The Safety Board recognized the need for such higher standards in its investigation of the fire on board the small passenger vessel FANTASY ISLANDER near Punta Gorda, Florida on September 8, 1984. As a result of this investigation the Board issued to the Coast Guard Safety Recommendation M-85-084 to require more stringent inspection of dry exhaust piping installations on small passenger vessels. The Safety Board believes that the proposed regulation will significantly improve fire safety on board small passenger vessels and urges its adoption.

15. Section 184.115(a) exempts existing vessels from compliance with the requirements of section 184.404 (radar), section 184.406 (speed indicating devices for dynamically supported craft), section 184.408 (fathometers), section 184.410 (electronic position fixing devices), and section 184.602 (internal communication systems). The Safety Board is opposed to granting these exemptions. The Safety Board believes that the proposed equipment is just as important on existing vessels as it is on new vessels. The Safety Board believes that the proposed equipment would significantly improve the safety of navigation of small passenger vessels, and that passengers are entitled to the same level of safety, regardless of the age of the vessel. The Safety Board believes that existing vessels should be required to meet sections 184.404, 184.406, 184.408, 184.410, and 184.602 by the end of a reasonable phase-in period, such as 5 years.

16. Section 184.115(b) exempts an existing vessel from complying with the requirements of section 184.610 (public address systems) for 5 years after the effective date of the regulations, or 10 years after its keel was laid, whichever is later. The Safety Board believes that the proposed phase-in period is excessive and favors a shorter period, such as 3 years.

17. Section 184.402 proposes the requirements for the carriage of a "suitable magnetic compass" by small passenger vessels. The Safety Board believes that this section of the proposed rules does not adequately provide for the safe navigation of all small passenger vessels. As a result of the Board's investigation of the grounding of the PILGRIM BELLE in 1985, the Board recommended that all passenger vessels that have overnight accommodations for 50 or more passengers and that operate on all routes other than rivers be equipped with gyrocompasses (Safety Recommendation M-86-051).

The Safety Board still believes that gyrocompasses are necessary on these passenger vessels so that radars may be gyrostabilized, and urges the Coast Guard to revise section 184.402 of the NPRM to implement the intent of Safety Recommendation M-86-051.

18. Section 184.404 proposes that "a general marine radar system for surface navigation with a radar screen mounted at the operating station" be fitted on certain specified small passenger vessels. As a result of its investigation of the collision between the U.S. passenger vessel YANKEE and the Liberian freighter HARBEL TAPPER in 1983, the grounding of the U.S. passenger vessel PILGRIM BELLE in 1985, and the collision between the U.S. passenger vessels JACK W and JAMEY DOWNEY in 1987, the Safety Board issued a series of safety recommendations concerning the need for radar, and in some cases gyrostabilized radar, on passenger and small passenger vessels. The Safety Board believes that section 184.404 is a significant improvement over the existing regulations and urges the adoption of this section. However, the Safety Board urges the Coast Guard to require gyrostabilized radars on all small passenger vessels with overnight accommodations for 50 or more passengers and all vessels carrying 150 or more passengers on lakes, bays, and sounds, coastwise, and ocean routes.

19. Section 184.408 proposes that a fathometer be required on all small passenger vessels more than 65 feet in length and on all "dynamically supported craft," other than air cushion vehicles. As a result of its investigation of the grounding of the U.S. passenger vessel PILGRIM BELLE in 1985, the Safety Board recommended (Safety Recommendation M-86-53) that all passenger vessels on all routes other than rivers be equipped with a fathometer. The Safety Board recognizes that the proposed regulation is a significant improvement over the existing regulations, which do not require any small passenger vessel to be equipped with a fathometer, and, therefore, supports the adoption of this regulation. However, we encourage the inclusion of all vessels as stated in Safety Recommendation M-86-53.

20. The Safety Board has recommended that the Coast Guard require all passenger vessels that operate on all routes other than rivers be equipped with an electronic position fixing device such as LORAN or a satellite navigation receiver (Safety Recommendation M-86-054). Section 184.410 proposes that all small passenger vessels operating on an oceans route be equipped with an electronic position fixing device. The Safety Board maintains that electronic position fixing equipment should be required on all passenger vessels on all routes other than rivers. The Safety Board believes that any vessel that leaves the sight of land should have electronic position fixing equipment on board for the protection of its passengers. If a vessel is operating beyond sight of land when visibility deteriorates, or when an emergency develops, the operator of the vessel will need to be able to fix his vessel's position in order to navigate, or to provide coordinates for search and rescue units. Without a suitable electronic position fixing device on board, many small passenger vessel operators may not be able to cope with such an emergency situation, and passengers will be needlessly endangered.

21. As a result of its investigation of the fire on board the U.S. small passenger vessel FANTASY ISLANDER in 1984, the Safety Board recommended that small passenger vessels be required to display a placard near the radio transmitter containing vessel information to be used when initiating a distress broadcast. Section 184.506 proposes that such a placard be required on all small passenger vessels, and the Safety Board urges adoption of this regulation.

22. Section 184.610 proposes that certain passenger vessels be equipped with a public address system operable from the vessel operating station. As a result of its investigation of the collision between the U.S. passenger vessel YANKEE and the Liberian freighter HARBEL TAPPER in 1983, the Safety Board recommended that passenger vessels with more than one passenger deck be required to have an adequate loudspeaker system suitable for announcing passenger advisories, instructions, and emergency alerts from the navigation bridge (Safety Recommendation M-84-025). The Safety Board believes that section 184.610 offers a significant improvement in safety on small passenger vessels and urges the adoption of this regulation.

23. Section 185.304 proposes new operational requirements designed to enhance the safe navigation of small passenger vessels. The Safety Board has previously recommended (Safety Recommendation M-86-056) that masters and watchstanding officers on all passenger vessels that have overnight accommodations for 50 or more passengers on other than river routes comply with navigation procedures similar to those found at 33 CFR 164.11. (33 CFR 164.11 applies to self-propelled vessels of 1600 or more gross tons operating on the navigable waters of the United States.) Since section 185.304 proposes requirements similar to those found in 33 CFR 164.11, the Board believes that this section is responsive to Safety Recommendation M-86-056 and urges the adoption of this regulation.

24. Section 185.306 of the proposed rules requires the master of a small passenger vessel to exclude passengers from the vessel operating station while a vessel is underway. However, this regulation is proposed to apply to only those vessels that carry more than 150 passengers or that are more than 65 feet in length and have overnight accommodations for more than 49 passengers. As a result of the Board's investigation of the 1985 collision between the U.S. passenger vessel MISSISSIPPI QUEEN and the U.S. Towboat CRIMSON GLORY, the Board issued Safety Recommendation M-86-068 to the U.S. Coast Guard:

> Require that the licensed operators of small passenger vessels exclude, whenever practical, passengers from the pilothouse and navigator's bridge while the vessel is underway.

The Safety Board maintains that excluding passengers from the vessel operating station should be required, in so far as it is practical, on all small passenger vessels regardless of the number of passengers, the length of the vessel, or the number of overnight accommodations.

25. Section 185.502 proposes that a correct list of the names of all persons who embark and disembark from certain passenger vessels be made and be required to be deposited ashore in a well marked location at the vessel's normal berthing location or with a representative of the owner or managing operator of the vessel. The Safety Board has long recognized the value of such a listing to search and rescue authorities in the event of an accident, and has issued Safety Recommendations M-84-014 and M-84-028 recommending such a requirement for passenger vessel operators. The Safety Board urges the adoption of this regulation.

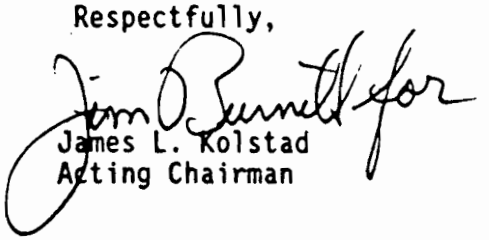
26. Section 185.506 proposes that a safety orientation briefing be required to be provided to passengers prior to a vessel getting underway. This proposal is a significant improvement over the existing regulation that provides for an optional safety orientation briefing. The Safety Board has recommended that safety orientation briefings be made mandatory on all small passenger vessels (Safety Recommendations M-83-79, and M-87-113). Section 185.506 is responsive to the intent of Safety Recommendations M-83-79 and M-87-113, and the Safety Board urges the adoption of this regulation.

27. Section 185.508 proposes that the master require passengers to don life preservers when possible hazardous conditions exist. The Safety Board has recommended that child passengers be required to don life preservers while a vessel is departing protected waters (M-83-080), and that all passengers on board passenger vessels up to 65 feet in length on ocean or coastwise routes be required to don life preservers while on open decks during the time that these vessels are leaving or entering ports which are susceptible to breaking waves (M-86-113). Although the proposed regulation 185.508 does not address specifically the situations that the Board has identified in Safety Recommendations M-83-080 and M-86-113, the Board believes that a reasonable interpretation of the proposed regulation covers the situations of greatest safety concern, and the Board urges the adoption of this regulation.

28. The proposed regulations (sections 185.520 and 185.524) set forth requirements for the holding of abandon ship and fire drills. Abandon ship drills are specifically required only "on a vessel which requires more than four survival craft to accommodate the total number of persons permitted on board, and on a vessel of more than 65 feet in length with overnight accommodation for more than 49 passengers," and fire drills are required "as are necessary to make sure that all members of the crew are familiar with their duties in case of a fire." The Safety Board believes that these requirements are inadequate. As a result of its investigation of the grounding of the small passenger vessel PILGRIM BELLE in Vineyard Sound, Massachusetts on July 28, 1985, the Safety Board recommended that the Coast Guard require fire and boat (abandon ship) drills that include passengers reporting to their emergency muster station on all passenger vessels within 24 hours of departure on cruises that are more than 1 day's duration (Safety Recommendation M-86-060). The Board urges the Coast Guard to revise sections 185.520 and 185.524 to comply with Safety Recommendation M-86-060.

The Safety Board believes that this proposed rule making addresses important safety isssues and is pleased to have had the opportunity to make these comments.

Respectfully,



James L. Kolstad
Acting Chairman

Conflict with Foreign, State or Local Laws, or with Existing Agreements

Numerous comments indicated that drug testing of individuals was contrary to existing foreign or state laws prohibiting such testing. Other comments stated that the current programs are the result of collective bargaining agreements with affected unions and that the requirements of the proposed rules will send them back to the bargaining table.

Response: The Coast Guard recognizes that some state or local laws and some foreign laws may prohibit or limit the testing required under the final rule. Because of the predominant role assigned the Coast Guard concerning the safe operation of U.S. vessels in commercial service, it is the Coast Guard view that these rules preempt state laws. The complexity and variable circumstances encountered in the interaction of U.S. and foreign law concerning U.S. flag vessels operating within the jurisdiction of a foreign country requires each such situation to be separately analyzed.

We are aware of concerns expressed by foreign entities and foreign governments concerning the potential of our rule to have effect outside United States territory. There are several kinds of situations in which this concern appears to arise.

The first such situation involves a foreign citizen employed by a U.S. company. To begin with, we believe it is fundamental that a foreign citizen employed in the United States by an American company is fully subject to U.S. law, including the requirements for drug testing. With respect to employees of an American company located in a foreign country, it is not our intention to require an employer to violate local law. The requirement to ensure that employees located in a foreign country are subject to drug testing will not become effective until January 1, 1990. This additional compliance period is intended to minimize disruption for employers and employees while the U.S. government meets with foreign governments to discuss implementation of the requirements of the rule.

The second situation that has generated interest in this context concerns foreign entities that are contractors to U.S. companies. The Coast Guard position is that a marine employer who uses contract personnel to perform the duties of a crewmember has "engaged" those personnel. Therefore, the final rule subjects employees of the contractor to the same drug-testing requirements as direct employees of the marine employer. This requirement is necessary to ensure that U.S. companies do not circumvent the rule by contracting out for services. Some foreign entities and their governments, however, have suggested that this gives the rule extraterritorial effect, since a foreign contractor, like a U.S. contractor, would have to comply with our rule.

However, our rule does not *require* any foreign contractor to conduct drug testing of its employees. The rule imposes requirements only on the operator, i.e., marine employer. It is the responsibility of the marine employer to ensure that crewmembers are drug-free, as enforced by the drug-testing program we are today establishing. In that respect, the drug-testing requirements are not fundamentally different from other testing and training requirements. While it is true that foreign contractors will have to ensure that their employees who service U.S. companies meet our requirements, the same is also true for U.S. contractors.

Nevertheless, we appreciate the seriousness of the concerns expressed on this point. Therefore, the final rule provides that U.S. companies can continue to use foreign contractor employees, whether or not they have instituted drug-testing programs, through December 31, 1989. This short delay in the application of our rule to foreign contractors will provide an opportunity for additional discussion between governments.

The third situation involves a foreign citizen, employed by a foreign company, on a U.S. vessel operating in waters subject to the jurisdiction of the United States. Under agreement between the United States and Canada, Canadian pilots are required on American vessels under certain circumstances in both American and Canadian waters. These pilots, moreover, may, at least in some instances, be employees of the Canadian government. Representatives of the Canadian government have expressed the view that requiring testing of these pilots, even if they are in the United States at the time of the test, might violate the Canadian Human Rights Act. While there is as yet no

APPENDIX J

definitive understanding about the extent and effect of Canadian law on random drug testing by Canadians operating in the United States, further consultation with the Canadian government seems advisable. Under the circumstances, we have determined to postpone implementation of the final rule, except for post-casualty testing, insofar as it would affect foreign pilots and foreign vessels, until January 1, 1990. This will allow for consultation between governments about implementation of the requirements of the rule.

There are also issues about random tests for employees of U.S. companies where the vessels may not return to the U.S. during the year. The company is required to conduct the tests in international waters, where feasible, or on board the ship within the territorial waters of a foreign country where such testing does not violate the laws of the foreign country. Where foreign law prohibits the testing of an employee regardless of his location, implementation of the final rule, insofar as it would affect such individuals, is postponed until January 1, 1990, to allow consultations between governments.

We have determined not to make the rule applicable in any situation where compliance would violate the domestic laws or policies of another country. In addition, because of the potential confusion that may exist involving application of this rule in situations where compliance could violate foreign laws or policies, we have determined not to make the rule applicable, until January 1, 1990, in any situation where a foreign government contends that compliance with our rule raises questions of compatibility with its domestic laws or policies. During the next year, the Department of Transportation and other U.S. government officials will be working closely with representatives of foreign governments with the goal of reaching permanent resolution to any conflict between our rule and foreign laws and policies. The U.S. and Canadian Governments have already established a bilateral working group in an attempt to achieve this objective. We believe that considerable progress has already been made, and further meetings will be held in the near future. While we believe that this can be a model for addressing the concerns of other countries, it is not intended to be the exclusive means. The Commandant may delay the effective date further under this section, if such delay is necessary to permit consultation with any foreign governments to be successfully completed.

It is the agency's intention to issue a notice no later than December 1, 1989, that would make any necessary amendments to the rule as a result of discussions with foreign governments. Shortly after their issuance, any such notices will be published in the **Federal Register**. While we recognize that this may create some anomalous conditions in competitive situations, it is the intention of the U.S. government to make every effort to resolve potential conflicts with foreign governments in a manner that accommodates their concerns while ensuring the necessary level of safety by those we regulate.

APPENDIX D

COMMENTS OF THE NATIONAL TRANSPORTATION SAFETY BOARD ON PROGRAMS FOR CHEMICAL DRUG AND ALCOHOL TESTING OF COMMERCIAL VESSEL PERSONNEL

SEP 9 1988

Executive Secretary
Marine Safety Council (G-LRA-2/21)
U.S. Coast Guard
Washington, D.C. 20593

Dear Madam/Sir:

The National Transportation Safety Board (NTSB) has reviewed your Notice of Proposed Rulemaking (NPRM), "Programs for Chemical Drug and Alcohol Testing of Commercial Vessel Personnel" which appeared in the July 8, 1988, Federal Register (53 FR 131). The Coast Guard is to be commended for crafting one of the most complete and comprehensive drug and alcohol rules in the various modes of transportation. The Safety Board offers the following specific comments on the rule for the Coast Guard's consideration:

1. Employees Subject to Testing. The Safety Board supports the proposed application of this rule to a broad range of merchant marine personnel. The Board also recommends that the Coast Guard consider some mechanism for including under the provisions of this rule the shore-based person-in-charge of the loading and unloading of vessels of oil and hazardous chemicals in bulk and his assistants (33 CFR 154). Currently such individuals are not required to be licensed or documented, and therefore, are not covered by the regulations in this proposal. These individuals do, however, have responsibility and influence over public and environmental safety similar to those of the Coast Guard licensed officers and/or tankermen subject to this rulemaking.

   The Safety Board also recommends that Federal pilots be specifically included among those marine personnel subject to this rule (Section 4.03-4). State pilots are under the authority of State Pilots Commissions and should be subject to State alcohol and drug regulations comparable to this proposed Coast Guard rule. However, Federal pilots are not subject to State commissions and therefore should be monitored by the Coast Guard and should meet the requirements of this drug and alcohol rule.

2. Post-accident Testing. The Board believes that the proposed 24-hour time limit for post-accident sample collection is excessive and may contribute to delays in post-accident testing of crewmembers and other individuals who may be involved in an accident. Delays in the collection of toxicology specimens can seriously diminish and even invalidate the probative value of drug/alcohol toxicology tests.

Sample collection delays of more than 4 hours seriously limit the ability of tests to detect the parent drug or its psychoactive component(s) such as cocaine, THC, some amphetamines, and PCP in the blood. Information on these components and their respective concentrations in the blood is often vital to the interpretation of possible drug effects on human performance at the time of the accident -- information essential in the determination of the probable cause of the accident.

For the determination of possible alcohol impairment, even a 4-hour delay can preclude the detection of alcohol in the body, because of its rapid rate of elimination in the body. Most States, for example, establish a 3-hour limit for the collection of breath/blood alcohol samples for highway law enforcement purposes. The Board acknowledges that, in some instances, the collection of a sample within 4 hours (or at all) will be impossible. However, on-board testing kits would make testing within this time period feasible. (In Subpart 4.06-1(A)(3), marine employers should be required to ensure that blood and urine sampling and shipping kits are maintained on board unless personnel can be made available for sample collection within 4 hours of a serious marine incident.) Given the widespread availability of medical facilities and emergency transportation in the U.S., the testing of individuals on vessels in or near intra-coastal or continental waters should also be possible in most cases.

Therefore, the Board recommends that the Coast Guard specify a maximum 4-hour limit for the collection of post-accident toxicology samples. Failure to collect a sample within this period should result in an appropriate penalty to the employer and/or employee. Because toxicological samples collected even after 4 hours may provide some useful information, samples should still be collected even if the 4-hour period has expired.

3. Random testing. The NTSB believes that aggressive reasonable cause testing (triggered by any of a wide range of potentially safety-related errors or work behavior patterns), combined with effective management supervision of employees, post-accident/incident testing, pre-employment testing, periodic (medical) testing, and competent drug/alcohol education and treatment are the essential components of an effective anti-drug/alcohol abuse program. The Board recommends that the Coast Guard first require marine employers to implement fully these critical program measures before embarking on additional measures, such as random testing.

However, should the Coast Guard choose to include random testing in the final rule, the Safety Board would raise the following concern: To be effective, random testing must be performed on a substantial proportion of employees and on a sufficiently frequent basis to be perceived as a credible deterrent. Although the Safety Board is aware of no research

indicating which frequency/sampling proportion creates a deterrent, we suspect that the "effectiveness" threshold is closer to the upper level of testing (125 percent) presented in the NPRM than it is to lower levels. Each employee must be convinced that he or she might be tested at any time, including soon after his or her first yearly random test, to preclude drug use in the interim between random testing cycles.

4. Employee Assistance Programs. The Safety Board concurs in the proposed requirement that employers provide employee assistance programs (EAPs) for their personnel. As mentioned previously, the Board believes that drug education and training are vital components of effective anti-drug and alcohol abuse programs. Beyond the humanitarian value of rehabilitation, there may also be a safety benefit. If successfully rehabilitated, the trained and experienced employee may well be safer than a novice employee less familiar with the demands of the job. The Board supports the one-time opportunity for participation in drug/alcohol rehabilitation programs defined in Option 3 for identified drug/alcohol users. The Board believes that employers should be required to remove from service all those employees in safety-sensitive positions when testing confirms drug or alcohol use. Without mandatory suspension, drug and alcohol testing programs have little or no deterrent value. Furthermore, the rule should spell out in detail the supervisory controls and follow-up testing regimen for drug abusers who have voluntarily submitted to Employee Assistance Program rehabilitation before being tested in one of the types of involuntary testing under the rule and found positive.

5. Accuracy and Competence of the Testing Program. One of the key components of the potential success of this proposed Coast Guard rule is the accuracy and competence of the drug and alcohol testing programs to be employed by the aviation industry. As the Federal Railroad Administration experienced, few issues surrounding proposed alcohol and drug rules generate as much controversy among employees and their unions as the concern over the accuracy/competence of drug testing. The Safety Board shares the view that drug testing programs, whether operated by Federal agencies or individual companies, should meet the highest standards for scientific accuracy and validity. Therefore, the Safety Board strongly concurs with the requirement that all drug testing laboratories performing drug/alcohol testing (under the authority of the proposed rule) meet the scientific and technical requirements of the Department of Health and Human Services Guidelines (52 FR 30638, August 14, 1987). Because the HHS Guidelines contain restrictions that are either inconsistent with the above comments (e.g., applying only to urine testing, only a limited set of drugs, etc.) or inappropriate for private sector testing programs (e.g., specifying certain reporting requirements), the Safety Board recommends that RSPA work closely with the National Institute on Drug Abuse to refine Guideline requirements for this application.

6. Employee Privacy. The preamble to the NPRM (53 FR 25939) raises a series of questions regarding the circumstances under which test results could be released by an employer to third parties. This rule should be written so that it does not conflict with the Safety Board's statutory authority and responsibility to gather evidence in its accident investigations. The Independent Safety Board Act of 1974 (49 USC 1901 et. seq.) clearly gives the Board power to obtain physical samples or test results necessary for its investigations. In the event of a deceased operator, the Board may order the autopsy or seek other tests as may be necessary, or obtain a copy of the autopsy performed by State or local officials [49 USC 1903 (b)(5)]. If the operator survives, the Board may obtain physical evidence or reports on tests, by issuing a subpoena, if necessary [49 USC 1903 (b)(1 and 3)].

   The final rule should clarify that the Board has authority to obtain this evidence in the course of its accident investigations. In this way, employers will not be confused with respect to the authority of the Safety Board in accident investigations. Doing so will alleviate the problem of employer reluctance to release information to the Safety Board.

   Questions also are raised with respect to the release of test results to subsequent employers. The Safety Board has not previously addressed this issue with respect to the release of drug test results. However, the Board does believe that a prospective employee's prior job performance should be an important consideration in an employer's hiring decision. Certainly, any prospective employer considering an applicant for a safety-sensitive position in transportation should have access to drug and alcohol test results obtained under this rule.

7. Alcohol Testing. The Safety Board is pleased that alcohol testing is included in this rule. The accident statistics presented in the preamble to this rule and elsewhere demonstrate that there is no question that alcohol remains a widely abused drug. Additionally, the Safety Board is pleased by the proposal in Sec. 4.06-15(f) to consider any BAC reading above 0.02 percent as a positive test result. The Board has consistently recommended to the Coast Guard and others that the permissible blood alcohol level for commercial transportation operators be reduced below 0.04 percent. Therefore, this is an encouraging step toward the adoption of our recommended policy.

The Safety Board appreciates the opportunity to comment on this rulemaking proposal.

Respectfully,

ORIGINAL SIGNED BY
JIM BURNETT

James L. Kolstad
Acting Chairman

APPENDIX E

DRAFT OF AN IMO MARTIME SAFETY COMMITTEE CIRCULAR: SPECIAL FIRE SAFETY REQUIREMENTS NOT PRESENTLY ADDRESSED BY THE SAFETY OF LIFE AT SEA CONVENTION

ANNEX 9

DRAFT MSC CIRCULAR

SPECIAL FIRE PROTECTION SYSTEMS FOR LARGE OPEN MULTI-DECK AREAS ON PASSENGER SHIPS

1 The Maritime Safety Committee, recognizing the recent trend in the design and construction of passenger ships in the incorporation of large open multi-deck areas (atriums) into ship design, approved at its fifty-eighth session certain amendments (attached) to the 1974 SOLAS Convention, as amended, to take account of special fire safety requirements for such areas which are not presently covered in the Convention.

2 The special requirements are as follows:

Items requiring special standards where large open public spaces span three or more decks containing combustible materials such as furniture and fittings and enclosed spaces such as shops, offices, restaurants, etc., are as follows:

.1 the entire main vertical zone containing the space shall be protected throughout with a smoke detection system in compliance with regulation II-2/13, with the exception of 13.1.9;

.2 the space shall be provided with a smoke extraction system capable of exhausting the entire volume of the space within 10 minutes. The smoke extraction system shall be capable of being activated by the smoke detection system and capable of manual control;

.3 each level within the space shall have two means of escape, one of which should be an enclosed vertical escape as defined in regulation II-2/28.1.5;

.4 the entire main vertical zone containing the space shall be protected with an automatic sprinkler system in accordance with regulation II-2/12.

3 Members are invited to take account of the proposed amendments to the Convention and apply them, as appropriate, pending their introduction into the Convention.

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APPENDIX F

U.S. PROPOSAL ON PASSENGER SHIPS: ON-BOARD TRAINING AND DRILLS

Original: ENGLISH

IMO

SUB-COMMITTEE ON FIRE
PROTECTION - 33rd session
Agenda item 12

FIRE PROTECTION SYSTEMS FOR PASSENGER SHIP SAFETY

Passenger ships: on board training and drills

Submitted by the United States

1 Several recent passenger ship fires, one of which resulted in fatalities, established the fact that for some passenger ships the crew's performance during fire emergencies is inadequate. The United States feels that on board training and drills would go far in solving this problem. Current SOLAS Chapter II-2 regulations do not require on board training or drills for fire emergencies, and regulations III/18 and 25 do not contain any detailed requirements for fire drills.

2 IMO Resolution A.437(XI) "Training of Crews in Fire-Fighting," contains information on land based fire fighting training for marine personnel; this proposal concerns shipboard training and drills after the completion of such training.

3 The master must establish an emergency organization to fight fires and deal with abandon ship emergencies. This organization should include all members of the crew, and there should be one organizational structure for both fire and abandon ship situations, since both may occur during the same incident. However, merely establishing the organization will not ensure that it will function properly in an actual emergency.

4 The following are reasons for conducting training and drills:

.1 Those on land often schedule disaster drills to perfect their skills and coordination, and ship's personnel need similar drills on board ship.

.2 While only an actual fire will truly test the crew, drills will test the crew's organization and basic abilities, as well as the ship's equipment.

.3 The human factor is very important. Each of the crew must recognize the importance of the emergency organization and must take his role in the organization seriously.

.4 Personnel have no opportunity to become well versed in fire fighting and fire safety measures unless they receive periodic training and drills. Land training is helpful, but by itself, insufficient, in that the crew must know how to perform on their ship - each ship or class of ships is different; for example, the location of fire fighting equipment varies from ship to ship. The common practice of transferring crew members from one ship to another at frequent intervals means that without on board training and drills they may not become sufficiently familiar with the fire safety features of the ship on which they are serving.

.5 Organization and teamwork in fire fighting is critical; this is something that can not be learned from a book or a lecture. Practice is the only way to develop this skill, and practice is the only way to test the fire fighting team's organization; the drills should be as realistic as possible.

5 Weekly fire and boat drills are required aboard all U.S. flag vessels. The United States regulations (Title 46, Code of Federal Regulations 78.17-35) include the following requirements for the fire drills:

.1 Conduct fire drills as if an actual emergency existed. All hands report to their respective stations prepared to perform the duties specified in the station bill.

.2 Start fire pumps using a sufficient number of outlets to show that the system is in proper working order.

.3 Bring all rescue and safety equipment from the emergency equipment lockers and have designated crewmembers demonstrate their ability to use the equipment.

.4 Operate all watertight doors in use while the vessel is under way and all fire doors.

.5 Make an entry in the log for each drill, including the date and hour, length of time of the drill, the number of lengths of hose used, and a statement of the condition of all fire equipment, watertight door mechanisms, and valves. If in any week the required fire drills are not held or only partial drills are held, make an entry stating the circumstances and extent of the drills held.

6 Chapter III specifies abandon ship drills and fire drills at weekly intervals, with each crewmember participating in at least one of each type of drill each month. Chapter III describes abandon ship drills in great detail. There are no detailed specifications for fire drills. Chapter II-2 is the logical place to include these requirements.

7 The United States believes that the Subcommittee should consider the following topics for an on board training and fire drill standard:

.1 Instruction in the purpose and meaning of the ship's station bill, fire control plans, and muster stations; instruction in each individual's assigned duties and the equipment issued; and instruction in the meaning of the ship's many alarms.

.2 On board refresher training - lectures, training books, and equipment demonstrations, including warnings on ways to prevent fires (good housekeeping, smoking), fire hazards from common shipboard supplies (paint, cooking oil, lubricants), and first aid techniques (burns, broken bones, cardiopulmonary resuscitation).

.3 Learning to work within the emergency organization, including working with the individual's superiors, his coworkers, and his subordinates, as applicable, and, for those in charge, exercising leadership.

.4 Instruction on the purpose of the ship's passive fire protection design features and the purpose and requirements of the shipboard fire patrol.

.5 Location and operation of shutdowns for ventilation fans, fuel, and lubricants; the manual fire alarm boxes and the ship's fire fighting equipment; and the fire doors and ventilation dampers.

.6 Instruction and drills on extinguishing fires including how a single crewman can extinguish small fires; special measures needed to combat fires involving dangerous goods, electrical installations, and liquid hydrocarbons; use of the ship's fire fighting equipment (e.g., fire hoses, fire nozzles, portable and semiportable fire extinguishers, and fire axes), including any post-drill cleanup and equipment stowage; dangers from fire fighting systems, e.g., carbon dioxide system discharges; and use of breathing apparatus, fireman's outfits, and personal equipment, including lifeline and harness.

.7 Means of escape from any location in the ship, including all stairways, ladders and emergency exits; procedures covering the search and evacuation of passengers from all locations in the ship; and the importance of closing doors after searching staterooms, not leaving fire hoses in doorways and not using elevators.

.8 Location of first aid equipment and of medical facilities; how to transport injured individuals; and first aid techniques, including treatment for burns, bleeding, and broken bones, and cardiopulmonary resuscitation.

8 The following equipment should be tested periodically; however, only a portion of each type of fire fighting and fire detection equipment, e.g., some and not all of the fire hoses, need to be tested during each drill:

.1 Detection systems; alarm systems; walkie-talkies, public address, and other communication systems; fixed fire extinguishing connections (e.g., fire hydrants); watertight doors and self-closing fire doors; pressure of portable and semiportable fire extinguishers, and shutdowns for ventilation, fuel and lubrication systems.

.2 Fire pumps, emergency fire pump, emergency generator, and the pressurized water tank, as appropriate; International Shore Connections; and the fire main system, hoses and nozzles.

.3 Inventory and condition of the contents of repair lockers.

9 In summary, the Subcommittee should consider training and fire drill requirements for passenger ships, and its application to cargo ships.

10 The United States proposes that the Subcommittee consider amending Regulation II-2/40 as follows:

.1 By changing the title of the regulation to:

"Fire patrols, on board training and drills, detection, alarms and public address systems"

.2 By adding a new regulation 40.7 as follows:

"7 For ships carrying more than 36 passengers, there shall be periodic on board fire training and fire drills. The training and the drills shall comply with the requirements established by the Administration which shall contain at least the standards adopted by the Organization.*

" * Reference is made to Standards for On Board Fire Training and Fire Drills adopted by the Maritime Safety Committee at its ____ session in ___ ____ (MSC/Circ.___)."

APPENDIX G

DRAFT IMO MARITIME SAFETY COMMITTEE CIRCULAR: FIRE DRILLS AND ON-BOARD TRAINING

ANNEX 10

FIRE DRILLS AND ON-BOARD TRAINING

1 Fire drills

1.1 Each member of the crew shall participate in at least one fire drill every month. A drill shall take place within 24 h of the ship leaving port if more than 25% of the crew have not participated in a fire drill on board that particular ship during the previous month. The Administration may accept other arrangements that are at least equivalent for those classes of ships for which this is impracticable.

1.2 In passenger ships, a fire drill with the participation of the crew shall take place weekly.

1.3 Each fire drill shall include:

.1 reporting to stations and preparing for the duties described in the fire master list required by regulation III/8;

.2 starting of a fire pump, using at least the two required jets of water to show that the system is in proper working order;

.3 checking of fireman's outfit and other personal rescue equipment;

.4 checking of relevant communication equipment;

.5 checking the operation of watertight doors, fire doors and fire dampers;

.6 checking the necessary arrangements for subsequent abandoning of the ship.

1.4 Fire drills shall, as far as practicable, be conducted as if there were an actual emergency.

1.5 Fire drills should be planned in such a way that due consideration is given to regular practice in the various emergencies that may occur depending on the type of ships and the cargo.

2 On-board training and instructions

On-board training and instructions in the use of the ship's fire-extinguishing appliances shall be given at the same intervals as the drills. Individual instructions may cover different parts of the ship's fire-extinguishing appliances, but all the ship's fire-extinguishing appliances shall be covered within a period of two months. Each member of the crew shall be given instructions necessary for the assigned duty.

3 Availability of fire-extinguishing appliances

3.1 Fire-extinguishing appliances shall be kept in good order and be available for immediate use at all times.

3.2 Equipment used during drills shall immediately be brought back to its fully operational condition and any faults and defects discovered during the drills shall be remedied as soon as possible.

4 Records

The date and details of the fire drills shall be recorded as prescribed in regulation III/18.5.

This proposal seeks to align the requirements for fire drills with those prescribed for abandon ship drills.

***

APPENDIX H

EXAMPLES OF SAFETY INFORMATION PROVIDED PASSENGERS BOARDING FOREIGN FLAG PASSENGER VESSELS

IMPORTANT IMPORTANT IMPORTANT

EMERGENCY PROCEDURES

PLEASE READ CAREFULLY

Your [illegible] for this voyage is marked on the face of this ticket

The Muster (Assembly) points are located as follows:

RAFTS	RAFTS	BOATS	BOATS	BOATS
1-2-3-4-5-6-7-8	9-10-11-12-13-14-15-16	1-2-3-4-5-6	7-8-9-10	11-12
Meet on	Meet on	Meet in Forward	Meet in Aft	Meet in
Observation Deck forward	Sun Deck aft	Apollo Dining Room	Gemini Dining Room	Venus Lounge

In case of Emergency you will be alerted by a signal consisting of seven short blasts and one long blast of the ship's whistle accompanied by the same signal on the ship's General Alarm. When you hear this signal you should follow the procedures outlined below

★ If you do not have a cabin proceed directly to your Muster (Assembly) Station as indicated above. Lifevests will be issued to you by ship's personnel when you arrive at the station.

★ If you do have a cabin, please proceed to that cabin and pick up the lifevests which are stored in the closet. If you are unable to locate your cabin [illegible] lifevests inside the cabin proceed directly to your Muster (Assembly) Station where ship's personnel will issue a lifevest to you. Any [illegible] small to wear an adult lifevest should be brought to the Muster (Assembly) Stations where they will be given a specially made children's lifevest.

★ If the [illegible] should sound while you are at the pool remember to take the time to slip street-clothes on over your bathing suit. [illegible]

Be sure to listen carefully to all announcements made over the Public Address system. Ship's personnel will be located throughout the vessel to assist you to your Muster (Assembly) Station as safely [illegible] as possible. These people are there to help should you become lost or confused, so remember to [illegible] instructions.

SeaEscape®

M/S SCANDINAVIAN STAR

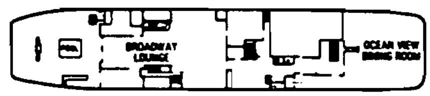
DINING INFORMATION

Suggested Dining Hours
For your convenience:
Lunch — 12:45 p.m. / Dinner — 7:15 p.m.

Dining Room Located on Main Deck

IT IS CUSTOMARY TO TIP YOUR WAITER
IF YOU ARE PLEASED WITH THE SERVICE

Main Deck



m/s Scandinavian Star

There is little likelihood we will encounter a situation requiring emergency preparation, but it is good practice to be acquainted with the safety features we have provided for you on this vessel.

—IN THE EVENT OF AN EMERGENCY—
An alarm will be given over the ship's public address system. This alarm signal will consist of 7 short and 1 long blast.

● ● ● ● ● ● ● ▬

When you hear this signal you are required to proceed immediately to your muster station.

Do Not Use Elevators!

Your muster station is:
DECK AREA (AFT)
Fantasy Disco BRIDGE DECK

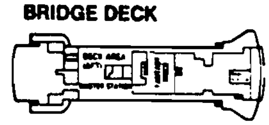
In case of an emergency remember, your ship's officers are highly trained experts, follow their instructions carefully and most important:

STAY CALM

HOW TO PUT ON THE LIFE JACKET:

1. Put jacket on.
2. Tighten tapes well in front.
3. Tie tapes.

BRIDGE DECK



APPENDIX I

U.S. COAST GUARD CONTROL ACTION FOR VERIFICATION OF COMPLIANCE WITH SOLAS AND U.S. REGULATIONS FOR FOREIGN FLAG PASSENGER VESSELS THAT ARE LESS THAN 100 GROSS TONS OR HAVE OVERNIGHT STATEROOM ACCOMMODATIONS FOR LESS THAN 50

of Transportation
United States
Coast Guard

(202) 267-1464

16711/31

27 JAN 1989

From: Commandant
To : Distribution

Subj: CONTROL ACTIONS FOR VERIFICATION OF COMPLIANCE WITH SOLAS AND U.S. REGULATIONS FOR FOREIGN PASSENGER VESSELS THAT ARE LESS THAN 100 GROSS TONS OR HAVE LESS THAN 50 OVERNIGHT STATEROOM ACCOMMODATIONS

Ref : (a) Title 46, U.S. Code (46 USC), Section 3505
(b) COMDTINST M16000.7, Marine Safety Manual (MSM), Volume II, Chapter 20
(c) Navigation and Vessel Inspection Circular (NVIC) No. 1-85
(d) COMDTINST 16702.1 re: Stability for Control Verification
(e) COMDT (G-MVI-1) Ltr 16711 dtd 31 May 88 re: Control Verification
(f) 46 USC 3303(a)

1. References (a) through (e) provide the authority and guidance for verifying a foreign passenger vessel's compliance with the appropriate inspection standards. These references focus on foreign passenger vessels which are "more than 100 gross tons having berth or stateroom accommodations for at least 50 passengers." Reference (e) is the most recent update of this guidance and will be incorporated in reference (b). Although there is a focus on larger passenger vessels with overnight accommodations, foreign passenger vessels which are less than 100 gross tons or have less than 50 overnight accommodations are also subject to examination to verify compliance with the applicable standards. As pointed out by a number of inspection offices, there is very little compliance and enforcement guidance regarding the latter category of vessels. The interim guidance provided below will be incorporated in reference (b) in an forthcoming change.

2. U.S. inspection laws and regulations apply to foreign flag vessels operating in the U.S., except that reference (f) provides for the recognition of foreign vessels inspected and certificated by countries having inspection laws and standards similar to those of the U.S. These vessels are subject only to a limited inspection to ensure the condition of their propulsion and lifesaving equipment. Countries that are party to and apply SOLAS are considered to have inspections laws and standards similar to those of the U.S.

3. For a foreign vessel inspected and certificated under SOLAS, primary reliance is placed on the flag Administration to certify the vessel's adherence to the applicable standards. U.S. laws, references (a) or (f), require that we, the Coast Guard, independently determine that these vessels are in compliance with the conditions of their certificates. By whatever name we call these examinations (e.g., freight vessel exam, tank vessel exam, Letter of Compliance, or control verification), they are all control actions for verification of compliance with SOLAS and U.S. regulations as may be applicable.

4. Foreign passenger vessels for which reference (a) is not applicable, i.e., those less than 100 gross tons or having less than 50 overnight accommodations, are generally subject only to the limited inspection provided by reference (f). This clearly suggests that the examination of such vessels will not be as

comprehensive as that inferred by the implementing guidance for reference (a). However, our responsibilities and Port State control authority under SOLAS also allow that, where there are "clear grounds" to believe that a vessel is not "substantially" in compliance, further control actions may be appropriate. In such cases, the matter is generally first referred to the flag Administration before taking action to intervene. Paragraph 6 of reference (e) provides some enforcement guidance relative to the degree of noncompliance which could be applied regardless of the vessel's type or size.

5. OCMIs should already be conducting examinations on all foreign passenger vessels embarking passengers in U.S. ports regardless of their size or number of overnight accommodations. Plan review per references (c) and (d) will continue to be routine for foreign passenger vessels over 100 gross tons having at least 50 overnight accommodations. For the smaller vessels, such plan review will not be routine. However, if the OCMI has reason to question the compliance or safety of a vessel in either category, then he may deem a more comprehensive inspection, including plan review (with the assistance of the Marine Safety Center, as necessary), to be appropriate before permitting the vessel to embark passengers in the U.S. Issuance of control verification certificates to vessels in either of these categories is appropriate as are quarterly reinspections.

6. Some foreign passenger vessels, particularly the smaller ones with limited routes, may have a number of exemptions granted by the flag Administration as provided by SOLAS regulations. Any exemption the OCMI has reason to question should first be addressed to the owner/operator. The onus should be placed on the owner/operator to present the appropriate SOLAS documents, including exemption certificates, and any supporting documentation. If issues regarding exemption are not resolved by the owner to the OCMI's satisfaction, the details of the case should be forwarded to Commandant (G-MVI-1) for further action, including communication with the flag Administration.

7. All foreign passenger vessels operating in the U.S. must have valid Passenger Ship Safety Certificates (PSSCs); otherwise, they are subject to inspection for certification under the applicable Subchapter of 46 CFR. Passenger vessels not registered in countries party to SOLAS will not have valid PSSCs. Additionally, since SOLAS passenger vessel requirements apply to vessels that carry more than 12 passengers, a vessel carrying 12 or less passengers, even if registered in a country party to SOLAS, will generally not have a PSSC. By virtue of their tonnage the subject vessels are also not likely to have cargo vessel SOLAS certificates. Guidance regarding the application of 46 CFR to these vessels is already provided in Chapter 21 of Volume II of the MSM.

8. Please distribute this letter to your field offices. Comments/recommendations regarding the control verification procedures and guidance would be particularly welcome at this time since revision of reference (b) is in progress.

JAMES M. MAC DONALD
By direction

DISTRIBUTION:
All District (m) Offices
Marine Safety Center
Marine Safety School

Copy: G-MTH-4
VEENTJER:jev 88JAN14 W1952v MVI-1#3108 P

APPENDIX J

U.S. COAST GUARD DISCUSSION OF ITS ALCOHOL/DRUG RULES THAT CONFLICT WITH FOREIGN, STATE, OR LOCAL LAWS, OR WITH EXISTING AGREMENTS (53 FR 47070-71)